Science and Policy in the International Framing of the Climate Change Issue

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Sammanfattning

Abstract

The IPCC and the FCCC are both central institutions in the international handling of the climate change issue. How these institutions frame and define the climate change issue is decisive for the action taken in response. The aim of this thesis was to analyze and describe how the climate change problem is framed and defined within the FCCC and the IPCC. Furthermore, the aim was also to examine if there are any differences between the IPCC’s and the FCCC’s framings and definitions of the climate change problem, and if so, what those differences consist of. The analysis was based on a line of documents from the IPCC and the FCCC, which were analyzed through a qualitative textual analysis.

The results of the analysis indicate that there are both similarities and dissimilarities between the institutions. The definitions of the term climate change differ in the sense that the FCCC only regards human-induced changes in climate, as climate change. The IPCC, on the other hand, includes both natural variability and human-induced changes in its definition of climate change. In the practical usage the definitions are similar, and the results indicate that the IPCC in practice has adopted the FCCC’s definition and only focuses on anthropogenic climate change. The climate change issue is by both of the institutions perceived as a greenhouse gas question, and the consequences are described as very extensive and serious. The IPCC gives advantages to mitigative responses in relation to adaptive, and also the IPCC describes mitigative responses as advantageous. Finally, the study indicates that there is a linking between the scientific and political spheres, which is extended by the fact that the FCCC’s definition of climate change creates a demand for scientific input in the decision-making process. The science and policy relationship builds upon mutual expectations of what the respective spheres can contribute with in terms of useful knowledge and policy-relevant questions.

Nyckelord

Keywords

IPCC, FCCC, problem framing, climate change, science, policy
Foreword

I would like to begin with saying that I am grateful that I got the opportunity to write my Master of Science Thesis as a part of the project CSP 2012+, which is a research project at the recently started Swedish Institute for Climate Science and Policy Research at the Linköping University. It has been very interesting and I have learned a lot, and I really hope that this thesis will provide useful information for the CSP 2012+ project and the Institute for Climate Science and Policy Research.

There are some people whom I would to take the opportunity to thank for the help and support with this thesis. Forskraftstiftelsen Theodor Adelswärds Minne for financial support that made this study possible. My tutor Professor Gunilla Öberg for valuable guidance during the whole process. Roger A. Pielke at the University of Colorado, for both inspiration and input in the problem formulation process but also for providing information. I also like to thank other persons connected to the CPS 2012+ whom I have been in contact with. Furthermore, I would like to thank the opponent and the examiner for comments that have been valuable for improving the quality of the thesis. Finally I would like to thank my family for all the support and encouragement, my dog Eddie for keeping me and my computer company, and last but not least, Markus for reading the thesis over and over again, and most important for being there for me.

Emma Larsson
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## Glossary

**Annex 1** An Annex to the Convention, which defines the countries that are committed to undertake specific commitments under the Kyoto Protocol. Developed countries and countries that are undergoing the process of transition to a market economy are included in Annex 1.

**Annex B** Annex that lists initial national commitments under the Kyoto Protocol.

**The Convention** United Nations Framework Convention on Climate Change. This term relates to the actual Convention document.

**COP** Conference of the Parties. The supreme decision making body of the FCCC. Meets once a year.

**Emission Trading** The buying and selling of emission allowances defined in the Article 17 of the Kyoto Protocol.

**FCCC** United Nations Framework Convention on Climate Change. This term relates in this thesis to the institution that is created under the Convention.

**GDP** Gross Domestic Product

**GHG** Greenhouse Gas

**ICSU** International Council of Scientific Unions

**INC/FCCC** International Negotiation Committee for a Framework Convention on Climate Change

**IPCC** Intergovernmental Panel on Climate Change

**Non-Annex 1** Countries that are not committed to undertake special commitments under the Kyoto protocol, i.e. the developing countries.

**Parties to the Convention** This term relates to the Parties that have ratified and accepted the Convention.

**UNCED** United Nations Conference on Environments and Development

**UNEP** United Nations Environmental Programme

**UNFCCC** United Nations Framework Convention on Climate Change. This term relates to the actual Convention document.

**UNGA** United Nations General Assembly

**WCP** World Climate Programme

**WMO** World Meteorological Organization
1. Introduction

The climate has always been changing, sometimes abruptly and sometimes gradually, however, in the late 1800s a discussion about a possible human interference of climate emerged in the scientific community.1 The Swedish scientist Svante Arrhenius, who in 1908 stated that industrial activity might significantly affect the climate, was the first scientist that explicitly claimed that the combustion of coal would cause rising temperatures.2 However, it was not until the beginning of the 1970s that the climate change issue received increasing attention in national and international institutions.3

It was soon realized that the question had to be discussed on an international level, mainly because of the global nature of the climate change problem. Thus, the question of a human induced climate change was one of the topics on the United Nations conference on Human Development held in Stockholm in 1972.4 In 1979 the World Climate Programme (WCP) was launched, which set forth a series of workshops under the auspice of the World Meteorological Organization (WMO), the United Nations Environmental Programme (UNEP), and the International Council of Scientific Unions (ICSU).5 At the last WCP-meeting in Villach in 1985 a group of international scientists reached a consensus that, as a result of the increasing concentrations of greenhouse gases in the atmosphere, a rise in the global mean temperature would occur in the first half of the next century.6 This group of scientists also stated that the question had to be discussed within the political sphere, and it was at this point that the problem of human induced climate change moved onto the political agenda.7

In 1988, the climate change issue became truly politicized, and the WMO and the UNEP established the Intergovernmental Panel on Climate Change (IPCC). The mandate of the IPCC is to assess the scientific information related to various components of the climate change issue, and the information needed to evaluate the environmental and socio-economic consequence of climate change.8 Furthermore, the IPCC has the task of formulating realistic response strategies for the management of the climate change issue. The following years the United Nations held several international conferences on the climate change issue, and in 1990 the International Negotiation Committee for a Framework Convention on Climate Change (INC/FCCC) was established by the United Nations General Assembly (UNGA).9 The negotiations resulted in the United Nations Framework Convention on Climate Change (UNFCCC)10, which was accepted at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992.11 The Convention entered into force in 1994, but the negotiations of how to implement and interpret the Convention have continued. In 1997 the Kyoto Protocol was signed at the third meeting of the Conference of the Parties (COP), but has not yet come into force because of several countries’ unwillingness to ratify.12 The latest attempt to reach an agreement, and move

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1 Jäger, J., O’Riordan, T., 1996: p. 6
2 Paterson, M., 1996: p. 20
3 Jäger, J., O’Riordan, T., 1996: p. 12
4 Skodvin, T., 2000a: p. 146
5 Agrawala, S., 1998: pp. 605-620
6 Jäger, J., O’Riordan, T., 1996: p. 14
7 Skodvin, T., 2000a: pp. 147-149
8 Skodvin, T., 2000b: p. 98
9 Skodvin, T., 2000a: pp. 147-149
10 Hereafter referred to as ‘the Convention’ when relating to the actual text of the Convention, or referred to as ‘the FCCC’ when relating to the institution that has been created under the Convention.
11 Skodvin, T., 2000a: pp. 147-149
climate policy forward, was the Ninth Conference of the Parties to the Convention, held December 1-12, 2003, in Milan, Italy.

The above-described picture tells us that the two most important actors involved in the international process of addressing the climate change issue are the FCCC and the IPCC. These actors have a set of implicit and explicit rules and decision-making procedures, and can be understood as international institutions concerning the climate change issue. The climate change itself cannot be perceived by our senses, thus it has to be pointed out to us by experts. Therefore, the international handling of the climate change issue has been characterized by a close connection between the political and scientific spheres. The foundation of the IPCC, with the aim to support policy-makers worldwide, follows a rational model for linking science to policy. This linking between science and policy builds on the presumption that scientific research can be targeted, uncertainties can be reduced or eliminated, and that policy-makers rationally can apply the scientific products to formulating policy-responses.

**Background and aim**

**Background**

The framing of problems such as climate change is of crucial importance for how they are tackled and acted upon. O’Riordan et al. (1998) argues that those who have control of knowledge production and problem framing, also have great access to decision-makers during times of political uncertainty. Therefore, in order to explain the international cooperation on climate change, we should look to those who control the knowledge production, and the way that these knowledge producers interact with decision-makers and co-produce the framing of the issue.

**Hypothesis and aim**

The point of departure for the thesis is that it has been argued that the FCCC and the IPCC have divided definitions and framings of the climate change issue, and that this in the prolongation affects the relationship between the scientific and political spheres. Therefore, the aim of this study is to analyze and describe how the climate change problem is framed and defined within the FCCC and the IPCC. The study will also examine if there are any differences between the FCCC’s and the IPCC’s framings and definitions of the climate change problem, and if so, what these differences consist of.

The empirical basis of the study will consist of documents from the FCCC and the IPCC, which will be analyzed through a qualitative textual analysis. To be able to say something about how the definitions and framings of the climate change issue influences the connection between science and policy, the results will be analyzed in relation to theories concerning the relationship between the scientific and political sphere.

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13 O’Riordan, T., et. al., 1998: p. 361
14 Hajer, M. A., 1995: p. 10
15 Skodvin, T., 2000a: pp. 149-149
17 ibid., pp. 2-3
18 O’Riordan, T., et. al., 1998: p. 363
The disposition of the thesis

The thesis is divided into six parts. After this first introductory and explanatory chapter relevant theoretical issues are discussed. In the third chapter the applied method will be described, i.e. textual analysis, and also other methodological issues are discussed. Chapter four is dedicated to the analysis and comparison of the IPCC and the FCCC. In the fifth chapter the results are discussed, and in the sixth part the conclusions are presented.

Background

Institutional structure of the IPCC and the FCCC

The IPCC was established in 1988 as a response to the emerging scientific and political discussions of the human-induced climate change. The role of the IPCC was, and still is, to assess the scientific, technical and socio-economic information relevant to understanding the scientific basis of climate change, its potential impacts and options for adaptation and mitigation, on a comprehensive, objective, open, and transparent basis. The main decision-making bodies of the IPCC are the panel plenary, the bureau, and the three Working Groups. The panel consists of government representatives that meet in plenary sessions once a year. The panel accepts, approves or adopts IPCC reports and is also responsible for the election of the IPCC chairs and the members of the bureau. Working Group I assesses available scientific information on climate change. Working Group II addresses the vulnerability of human and natural systems to climate change, the negative and positive consequences of climate change, and measures to adapting to climate changes. Finally, Working Group III assesses economical issues and mitigation options. The IPCC has made three assessment reports of the climate change issue so far: 1990, 1995 and 2001.

The Convention opened for signature at the Rio conference, and on the 21st of March in 1994 the Convention came into force. The Convention aims to stabilize greenhouse gas concentrations in the atmosphere at an unspecified but non-dangerous level. The COP is the supreme decision-making body of the FCCC, and responsible for the implementation of the Framework Convention. The COP had their first meeting in Berlin in April 1995 and has continued to meet annually. The Convention establishes an infrastructure of institutions and legal mechanisms that are intended to create a long-term process to address the climate change issue, rather than to impose strict obligations. The Kyoto Protocol was accepted at the third meeting of the COP, and proposes net-emission reduction targets for industrialized countries only.

The work of the IPCC has been characterized by the idea of a consensus concerning the climate change science, and has been guided by a vision of linking the global consensus to global policy. The IPCC is an intergovernmental body under the auspice of the UN and has one foot in the policy sphere, and the other foot in the scientific sphere, and therefore, of course never can be regarded as a purely scientific institution. When I have described the IPCC as a scientific institution it can be regarded as an oversimplification because there is a large amount of political involvement. On the other hand, the FCCC can not either be seen as a truly political institution since there is a considerable scientific influence in the decision-making process.

20 IPCC, 1999
21 Skodvin, T., 2000b: p. 106
22 Jasanoff, S., Wynne, B., 1998: p. 21
23 United Nations, 1992
24 O’Riordan, T., et. al., 1998: p. 373
26 UNFCCC, 1997
27 Jasanoff, S., Wynne, B., 1998: p. 72
2. Theoretical approach

Problem framing

How problems are defined is decisive for the action taken in response, and a problem has to be defined and accepted as a problem in the policy arena before any action can be taken. Therefore, great battles are fought in the public arena over problem definitions. Proponents of cognitive approaches to international relations suggest that the framing of issues in the negotiation process is an expression of political power. In this context power might be conceived as the ability to persuade others to buy into their framing. Social problems cannot be seen as objective and identifiable societal conditions that have intrinsically harmful effects, instead a social problem exists primarily in terms of how it is defined and conceived in society. There are many situations and issues in society that are important, but only a few of them are defined as problems, and even the same problem can be defined and framed differently by different actors. Issues often evolve through compromise as competing problem definitions move closer together, and this process becomes further complicated when the information and knowledge about the issue is uncertain, which is the case in the climate change issue. The uncertainty that surrounds the climate change issue makes it possible for various participants in the decision making process to appeal to different scientific data to justify their problem definition over others.

All statements about social problems select a specific interpretation of reality from a plurality of possibilities, and the reality that comes to dominate the society is decisive for the future of the social problem and policy. According to Hilgartner and Bosk (1988) a social problem can be defined as a putative condition or situation that is labeled a problem in the arenas of public discourse and action. A problem definition can be seen as a frame of reference that shapes how people gather and process information. Problem definition integrate science with values in the sense that it relates valued goals to scientific data on trends, conditions and projection with respect to those goals. Defined or undefined social problems can provide the scientific community with a natural connection between research and societal needs. The scientific research often provides insight to new alternatives for action, and sometimes changes the way people think about the problem. Hence, the problem definition process can be seen as a co-production of the science and policy community.

The problem-framing perspective has very much in common with the discourse perspective. A discourse can be explained as a distinct way of talking about, and understand the world or a specific problem. A discourse can be seen as decisive for how a problem is perceived, understood and framed, and the frame that surrounds a problem can also be regarded as the boundary of the discourse.

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29 O’Riordan, T., et. al., 1998: p. 376
30 Hilgartner, S., Bosk, C. L., 1988: p. 53
32 Hilgartner, S., Bosk, C. L., 1988: p. 58
34 ibid., pp. 258-261
The interaction between science and policy

Traditional model
There are many ways of perceiving the relationship between the scientific and political sphere. The scientific sphere has traditionally been regarded as strictly distinctive and separated from the political sphere, which is one of the factors that give scientific knowledge authority and legitimacy.\(^{36}\) The traditional model postulates that science and policy are activities that can be understood as occurring in distinct realms, where the political realm is perceived as the domain of values, power and persuasion, and the scientific realm as the domain of value-free and objective knowledge. When, and where, it is necessary the two spheres can interact through the flow of information, usually mediated by published literature or institutions.\(^{37}\) In the traditional model science receives status from its advisory role and actors in the political sphere can legitimize policy decisions by referring to the authority of science.\(^{38}\) In this way of perceiving the science and policy relationship, science for policy arises when scientific or technical information is required for solving a particular policy problem. Furthermore, the relationship builds on the presumption that science can inform policy and make it rational.

Trans-science
The idea that it is possible to separate the scientific and political spheres has been criticized, and Alvin Weinberg (1972) suggested that there are several issues that cannot be solved by the scientific or the political community alone. These questions can be regarded as trans-scientific issues. Trans-science can be described as an interface between science and policy, which means that there is a set of questions that can be asked but not answered by science.\(^{39}\) These questions cannot be answered by scientists because of the complexity and indeterminacy of the systems addressed, or the impossibility of testing the knowledge through usual empirical experimentation. The scientific sphere is therefore assigned an important role in clarifying where science ends and trans-science begins.\(^{40}\) The concept of trans-science establishes a boundary between pure science and trans-science, the former is value free, and the later is permeated by uncertainty, conflict, and subjectivity, but also this concept have been criticized.\(^{41}\)

Mutual construction
It has been argued that the boundaries between the spheres of science and policy are sustained in the concept of trans-science, and that the relationship between the scientific and political sphere is more complicated and the boundaries more fluid than this concept suggests.\(^{42}\) I believe that both scientific knowledge and policy decisions can be regarded as co-products of the political and scientific spheres. The political and scientific spheres work from different criteria and goals which implies that scientific knowledge not automatically can be applied and proven useful in a policy-making context.\(^{43}\) When research-based knowledge is used as an input to the policy-making process it will be taken out of its original context and interpreted within a new framework.\(^{44}\) An account of climate change grounded in contemporary social science research rejects the

\(^{36}\) Bäckstrand, K., 2001: p. 25
\(^{37}\) Shackley, S., Wynne, B., 1995: p. 219
\(^{38}\) Bäckstrand, K., 2001: p. 25
\(^{39}\) Weinberg, A. M., 1972: p. 209
\(^{40}\) ibid., p. 216
\(^{41}\) Bäckstrand, K., 2001: pp. 59-60
\(^{42}\) ibid., p. 26
\(^{43}\) Skodvin, T., Underdal, A., 2000: p. 27
\(^{44}\) Shackley, S., Wynne, B., 1995: p. 218
traditional model, in which science finds evidence of new environmental phenomena that leads to informed social responses via awareness of prediction, rational choice and control.45

Contemporary science and technology studies suggest that environmental issues of global scale emerge from the interplay of scientific discovery and description, together with other political, economic, and social forces.46 Jasanoff and Wynne (1998) argue that social and cultural commitments are built into every phase of knowledge production, and that discourses, beliefs, practices and goals all are part of the context in which knowledge is formulated.47 Shackley and Wynne (1995) argue that the criteria for “good science”, in the climate-related research, is not being determined from the scientific sphere itself, but is instead emerging through the process of mutual construction with policy institutions. Furthermore, the need and expectations of policy and the demand for policy relevance is fed into the domain of science.48 The process, through which scientific knowledge is transformed into decision premises, is neither pure science, nor pure politics, but the process combines elements from both realms and add their own distinctive characteristics.49 Closure or consensus on the answers to particular science-based policy questions are sometimes achieved by regulatory policy decisions rather than by science, but are still presented as being purely scientific in character.50 The framing of policy and policy practices is shaped by scientific knowledge, but most particularly by expectations of what science might be able to provide in the future, in terms of useful knowledge.51

Weingart (1999a) argues that even if the traditional model of the relationship between science and policy has been questioned by the sociologists of science, it is still the traditional model that predominate the perception among policy-makers and advisors. According to Weingart science and scientific advice has become increasingly important in the decision-making process. Furthermore, Weingart also argues that there are two paradoxes in the problem of scientific expertise and policy-making:

The first is the simultaneously scientification of politics and the politicisation of science. This has destructive effects: the increased use of scientific expertise by policy-makers has not increased the degree of certainty, in fact it becomes de-legitimating. This gives rise to the second paradox: despite the loss of authority of scientific expertise, policy-makers do not abandon their reliance on existing advisory arrangements, nor do the scholars adapt their ideas on science and its relation to politics.52

This suggestion has to do with the fact that the scientific and political spheres can not be separated from each other. This consequently leads to the fact that scientific knowledge is produced to suit the political purposes, and the policy-makers compete for the most recent knowledge in search for its legitimating power.53

45 Jasanoff, S., Wynne, B., 1998: p. 4
46 ibid., p. 4
47 ibid., pp. 16-17
48 Bäckstrand, K., 2001: p. 61
49 Skodvin, T., Underdal, A., 2000: p. 22
50 Shackley, S., Wynne, B., 1995: p. 220
51 ibid., p. 228
52 Weingart, P., 1999a: p. 151
53 ibid.
3. Methodological approach

Documents as an empirical basis

To approach the aim, I have taken my point of departure in the extensive written record of the IPCC and the FCCC. Documents reflect conscious and unconscious conceptions of the people that are involved in the creation of the texts, and can therefore say something about these institutions’ perception of the climate change issue. A document can be regarded as a stratification of social practices with a potential of having an affect on both short-term and long-term decisions. However, documents can not be regarded as reflections of reality since they are shaped in a specific context and affected by social and cultural commitments. One of the greatest benefits with using texts as an empirical basis is their stability. In contrast to observations and interviews the researcher does not influence or change the object in focus of the study by his or her mere presence.

Selection of documents

The analysis was based on a line of official documents authored under the IPCC and the FCCC. The selection of the documents was made on the basis that the degree of match between the research questions and the documents should be as high as possible. The point of departure for the IPCC analysis was the 2001 Synthesis Report and accompanying texts. This report synthesizes and integrates information contained in the Third Assessment Report and draws upon all previously approved IPCC reports. The Synthesis Report contains a Summary for Policymakers of the synthesis, the Synthesis Report itself, and is furthermore accompanied by the Summaries for Policymakers and Technical Summaries of the three Working Groups. The report, and the accompanying texts, represent a broad range of the IPCC’s material and consist of different types of texts, which have been written and accepted at different levels within the IPCC. The Climate Change 2001: Synthesis Report was produced and written with the aim to provide a policy-relevant, but not policy-prescriptive, synthesis and integration of information contained within the Third Assessment. It is intended to assist governments, individually and collectively, in formulating appropriate responses to the climate change issue.

The point of departure of the FCCC analysis was the Framework Convention on Climate Change, which constitutes the foundation of the FCCC. Furthermore, the Kyoto protocol was analyzed, and even though the protocol has not yet come in to force, it is still a central concern in the present negotiations. To complement these documents other decisions, action plans, and ministerial declarations from COP meetings that have a central role in the forwarding of the negotiations were analyzed. This collection of documents constitutes both older documents, which are still in force, and more currently accepted documents, and therefore presents a broad range of documents. The documents from the FCCC were developed and written during a complex negotiation process, and contains actual decisions adopted by the Conference of the Parties. They can therefore be regarded as representing some kind of consensus of the perception of the climate change issue within the FCCC.

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54 Bergström, G., Boréus, K., 2000: p. 15
55 May, T., 2001: p. 212
56 Merriam, S. B., 1994: p. 121
57 Hakim, C., 2000: pp. 47-48
58 IPCC, 2001a
59 ibid., Foreword
The documents from IPCC were all from 2001, but the documents from the FCCC were from a time-span of 1992 to 2002. This was based on a conscious choice that is motivated by the fact that the scientific basis from the IPCC have changed quite dramatically since the first report in 1990, but the political documents from the FCCC are still in force. Still you have to be aware of the possibility that the FCCC’s framing of the climate change issue might have changed since 1992, but at the same time the current discussions are still founded on the Convention text.

**Method of analysis**

The empirical material described above has gone through a qualitative textual analysis. When the researcher wants to penetrate a problem profoundly from a small material the qualitative method is preferable, and therefore a qualitative method has been applied. The point of departure of the qualitative methods is that every single phenomenon consists of a combination of qualities, which cannot be measured. Almost every method for textual analysis takes its point of departure in the hermeneutics. One of the main ideas of the hermeneutics is that the meaning of a sentence only can be understood in the light of the totality, and that the totality only can be understood in the light of the parts. In reality this means that I have shifted between looking at the meaning of the whole text, the context, a single sentence, and then back to the whole again, and so on. Another central idea is that the researcher never can be separated from his or her frame of reference, and never faces the text without pre-suppositions. The central frame of reference in this thesis was the theoretical framing described in chapter two. The hermeneutic process is dependent on the researcher’s own power of initiative to start a dialogue with the text. In order to start a dialogue a number of questions were formulated and asked to the texts, in a similar way that can be done in an interview. Through the process of analysis it is important to consider how the context affects the production, consumption and interpretation of the text. However, as a consequence of the delimitation of the study the analysis is more focused on the actual content of the texts rather than of the context in which they are produced. This also means that I will not analyze the empirical material in relation to theories focused on international relations.

The applied method is very similar to what Bryman (2002) describe as qualitative content analysis. This method includes the search for underlying themes in the material, which also was in focus in this analysis. In the analysis both the implicit and explicit aspects of the texts were searched for, since the actual meaning can be difficult to find. I have been trying to elucidate and conceptualize the essential content in the texts in relation to the aim of the thesis and the research questions defined below. The following questions were assorted under two different topics and formulated with the aim as the point of departure:

<table>
<thead>
<tr>
<th>1. Description, causes and consequences of the climate change issue:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. How is the climate change issue described?</td>
</tr>
<tr>
<td>b. In what kind of terminology is the climate change issue described?</td>
</tr>
<tr>
<td>c. What is causing the climate change issue?</td>
</tr>
<tr>
<td>d. What are the consequences of the climate change issue and who will be affected?</td>
</tr>
</tbody>
</table>

Figure 1: the figure shows the questions identified under topic 1.

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60 Svenning, C., 2003: p. 159
61 Andersen, V., Gamdrup, P., 1994: p. 71
62 Alvesson, M., Sköldberg, K., 1994: p. 115
63 ibid., p. 121
64 ibid., p. 162
65 Hellspong, L., 1997: p. 115
66 Essiasson, P., et. al., 2002: p. 233
67 ibid., p. 238
2. **Response to the climate change issue:**

<p>| | |</p>
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</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Is the main focus on mitigation or adaptation as responses to the climate change issue?</td>
</tr>
<tr>
<td>b.</td>
<td>What kinds of actors are described in relation to the suggested response strategies?</td>
</tr>
<tr>
<td>c.</td>
<td>What kinds of responses are suggested to the climate change issue?</td>
</tr>
</tbody>
</table>

Figure 2: the figure shows the questions identified under topic 2.

**Interpretation of the results**

I searched the texts for patterns and divergences of how the climate change issue is framed and defined within the organizations. These patterns were organized into themes found in the material. The texts were read and re-read several times, and the process of sorting the results was in continuous progress and reformulated several times to find the most representative interpretation. The textual analysis generated four themes from each organization’s material, which are shortly described below. The themes found in the analysis of the FCCC were compared with the themes found in the IPCC analysis, and the similarities and dissimilarities in the way that these institutions define and frame the climate change issue were sought for. The point of departure for the comparison was the questions decided in advance and the themes found in the material. The analysis was visualized by citations or by referring to the texts. To broaden the discussion about how the definitions and framings of the climate change affect the relationship between the scientific and political spheres, the results were analyzed in relation to relevant theories. The theoretical standpoints were developed during the process, and the way of working can be characterized by a continuous alternating between the empirical material and the development of theories.

**The themes found in the FCCC analysis**

**Human activities alter the atmosphere**

In this theme it became clear that the climate change issue is connected to, and caused by, greenhouse gases and human activities that alter the composition of the atmosphere, which could lead to extensive and serious consequences. This theme also indicates that the responses mainly are focused on reducing human emissions of greenhouse gases.

**Energy efficiency, public awareness, and economic responses**

This theme focuses on the actual responses that the FCCC suggest. It is concluded that measures, such as technology improvements, to make energy production and consumption more efficient are important for mitigating climate change. The promotion of public awareness and education is also an important part of the response strategies forwarded by the FCCC. Furthermore, the responses are discussed in economical terms and different economic means of control are suggested.

**Global approach: developed countries in the lead**

The third theme indicates that the FCCC perceives the climate change issue as caused by the past development of the developed countries. Furthermore, this theme implies that the developed countries have to take the lead in the handling of the climate change, and that the developed countries have to assist the developing countries to proceed their development and address the climate change issue.

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69 Alvesson, M., Sköldberg, K., 1994: pp. 41-42
Science as an important source of information
The forth theme concerns the strong dependence on scientific input in the FCCC’s framing of the climate change issue. The strong dependence on science suggests that there is an evident reliance on the notion that the scientific sphere can reduce many of the existing uncertainties.

The themes found in the IPCC analysis

Technology and research as responses to greenhouse gases
The first theme concerns how the IPCC frames climate change in relation to human emissions of greenhouse gases and suggested responses. The responses aims to decrease the emissions of greenhouse gases and the discussion mainly focuses on mitigative responses and not on adaptive responses. The responses are mostly described in terms of technological solutions and increased research and development.

Extensive consequences on human and natural systems
The second theme identified in the IPCC documents is the emphasis on the extensive consequences that the climate change will involve. It is obvious that the IPCC argues that climate change will have serious effects on both human and natural systems, and that these consequences can be valued and described in monetary units.

Uncertainty and complex interactions in the decision-making process
The third theme deals with how the climate change issue is described as an issue that is surrounded by irreducible uncertainties, which has fundamental implications for the decision-making process. It is argued that the political sphere has to deal with a lot of the uncertainties that the climate change involves.

Development, equity and institutional change
The fourth theme deals with the relation between the climate change issue and development paths and it is frequently emphasized that the climate change can effect other questions, such as equity and sustainable development. It is argued that the climate change is going to have the most extensive effects for those who already are vulnerable, which could lead to increased inequalities. The IPCC argues that there is a need for fundamental societal and institutional changes to deal with the climate change issue.
4. Comparing the FCCC and the IPCC

Definition and practical usage of the term climate change

When comparing the definitions it is clear that there are differences between the FCCC and the IPCC. The FCCC states in 1992 in the Convention that:

“Climate change” means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.\(^{70}\)

The above standing citation indicates that climate change, in the FCCC’s sense, means changes in climate that can be connected to human activities that alter the atmosphere. This means that the FCCC exclusively perceive the climate change issue as an issue connected to human emissions of greenhouse gases. Furthermore, it implies that natural changes in climate are not included in the FCCC definition. The FCCC have not provided any new definition since 1992 and therefore this definition can be regarded as the only existing definition. The IPCC is more inconsistent in their definition of the climate change issue. There is a consistency in the definition of climate change among the three Working Groups, but an inconsistency between the Working Groups and the Synthesis Report. The climate change is according to the Synthesis Report defined as:

[...] statistically significant variations that persist for an extended period, typically decades or longer. It includes shifts in the frequency and magnitude of sporadic weather events as well as the slow continuous rise in global mean surface temperature. Thus the discussion here includes climate-weather variations on all temporal and spatial scale, ranging from brief-lived severe storms to seasonal El Niño events, decadal droughts, and century shifts in temperature and ice cover.\(^{71}\)

This definition includes changes in climate that are statistically significant, but whether or not both natural and anthropogenic caused changes are included is not explicitly stated. On the other hand, all of the three Working Groups define climate change as:

[...] any change in climate over time, whether due to natural variability or as a result of human activity.\(^{72}\)

All in all, this means that climate change according to the IPCC’s definition is any change in climate, short-term or long-term, human induced or due to natural variability. From the analysis, it can be concluded that the FCCC’s definition excludes natural variability, and solely focuses on greenhouse gas emissions caused by human activities, whereas the IPCC has a wider definition of the climate change issue, which includes both short-term and long-term changes that are due to natural variability and human interference.

The FCCC’s definition of climate change corresponds with the practical usage of the term. One of the most characteristic features in the framing of the climate change issue is that the FCCC claims that climate change is caused by human activities and the emissions of greenhouse gases. The FCCC states in the Convention from 1992 that it is:

Concerned that human activities have been substantially increasing the atmospheric concentrations of greenhouse gases, that these increases enhance the natural greenhouse effect, and that this will result on average in an additional warming of the Earth’s surface and atmosphere and might adversely affect natural ecosystem and humankind.\(^{73}\)

\(^{70}\) United Nations, 1992: art. 1, § 2
\(^{71}\) IPCC, 2001a: p. 44
\(^{73}\) United Nations, 1992: p. 2
From the quotation above it can be concluded that the FCCC argues that there is a chain of reactions; human activities cause greenhouse gas emissions, that alter the atmosphere, that increase the natural greenhouse effect, that result in an additional warming, and finally lead to adverse effects to human and natural systems. The analysis shows that the climate change is perceived as a greenhouse gas issue. The FCCC states in 1992:

The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provision of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.  

The objective of the Convention indicates that the ultimate aim with the FCCC’s handling of the climate change issue is to stabilize greenhouse gases in the atmosphere. This way of perceiving the climate change issue also implies that all other conceivable causes to the climatic changes are not controlled under the Convention and other related documents.

The IPCC’s practical usage of the term climate change differs from its definition. In the running texts, the IPCC describes climate change as a problem caused by human emission of greenhouse gases, even though the IPCC’s definition suggest that the climate could be affected concurrently by natural and human factors. For example, in the Synthesis Report a figure shows that the emission of greenhouse gases is the driving force to the climatic changes. Thus, even if the IPCC in their definition gives a picture of that the climate could be affected concurrently by natural and human factors, its focus is on human interferences of the climate. In relation to this finding it is important to consider that the IPCC, in the Synthesis Report, explicitly states that it takes its point of departure in the Article 2 of the Convention, i.e. the objective, which the following quotation indicates:

It addresses specifically the issues of concern to the policymaker, in the context of Article 2 of the UNFCCC – issues such as the extent to which human activities have influenced and will in the future influence the global climate, the impacts of a changed climate on ecological and socio-economic systems, and existing and projected technical and policy capacity to address anthropogenic climate change.  

This illustrates that the Convention text probably has influenced the actual content in the IPCC reports, and this could be the reason for why the IPCC in the running texts takes its point of departure in the FCCC’s definition. This is a quite interesting finding. O’Riordan et. al. (1998) argues that the ability of actors to persuade others to accept their framing can be regarded as an political expression of power. In this perspective it may be argued that the IPCC has accepted the framing of the FCCC in the sense that it focuses on the FCCC’s definition, instead of using its own definition. This could be seen as an indication on that the FCCC, in this respect, is the actor with the most power. But there are also several other possible explanations. The IPCC has a definition that is independent from the FCCC, and the fact that the IPCC focuses on issues that the FCCC regards as relevant can also be understood as a indication on that the IPCC tries to present policy-relevant information.

The FCCC’s definition builds on the presumption that human-induced climatic changes can be separated from natural climate variability, but under the IPCC’s definition this separation becomes less important. The IPCC, moreover, argues that separating natural variability from anthropogenic interferences can be very difficult:

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74 United Nations, 1992: art. 2
75 IPCC, 2001a: p. 40
76 ibid., Foreword
77 O’Riordan, T., et. al., 1998: p. 376
To distinguish anthropogenic climate changes from natural variations, it is necessary to identify the anthropogenic “signal” against the background “noise” of natural climate variability.78

The FCCC assumes that natural variability and human interference can be separated, and does not even discuss possible problems with this separation and distinction. The IPCC focuses on proving that there actually is a climate change and that this change at least in part is due to human influences. This is done by presenting weather data on precipitation, temperature, droughts, heat waves etc. and relating these findings to the atmospheric concentrations of greenhouse gases and the IPCC claim that there, with a high degree of certainty, is a climate change.79 Even tough the IPCC argues that it is difficult to separate natural variability from human-induced changes, it is still arguing that the human influence on climate is rather indisputable:

New reconstructions of temperature over the last 1,000 years indicate that the temperature changes over the last hundred years are unlikely to be entirely natural origin, even taking into account the large uncertainties in palaeo-reconstructions.80

The analysis of the IPCC documents indicates that the IPCC regards itself as in a position in which it has to prove that human activities actually have affected the climate. Action under the FCCC’s definition of climate change requires that there is a human interference of the climate system, and the IPCC’s focus on proof could partly be regarded as a consequence of the FCCC’s definition. According to Hilgartner and Bosk (1988) the problem definition is decisive for the action taken in response. The narrow definition of the FCCC could further be regarded as a factor that affects the scientific focus on human interferences, and this could lead to a situation where extensive scientific resources are put on proving that there exists a human interference with the climate system. Consequently other interesting climate change related scientific issues might have been left unexplored.

According to Hilgartner and Bosk (1988) the problem definition is also decisive for what kind of knowledge that is gathered. From this perspective the results indicate that the FCCC’s problem definition shapes what kind of knowledge that is gathered or assessed within the IPCC. This can be regarded as an indication that, as discussed in chapter two, the criteria for good science is formulated through a process of mutual construction with policy institutions, and not by science itself. Furthermore, this indicates that the relationship between the scientific and political institutions is close, and that the expectations and demands for relevant knowledge from the political community in part control the knowledge production an vice versa.81 Weingart (1999a) calls this the politicization of science, which is characterized by the fact that the scientific knowledge is produced to suit the political purposes. Pielke (1997) argues that problem definition and framing relates valued goals to scientific data with respect to those goals.82 The FCCC’s definition gives an advantage to a specific type of knowledge, namely knowledge that is connected to human interference with the climate system, and science that aims to separate human and natural climate change. Pielke (1997) argues that too narrow definitions can lead to blind spots and indirectly to the exclusion of relevant aspects and responses, which seems to be the case in the climate change definition.83 The FCCC’s definition builds on a traditional view of the relationship between the political and scientific spheres, where science is the objective actor and where scientific knowledge via input to the decision-making process, can make policy rational.84

78 IPCC WG I, 2001a: p. 25
79 ibid., p. 25
80 ibid., p. 56
81 Bäckstrand, K., 2001: p. 61
83 ibid., pp. 258-261
84 Bäckstrand, K., 2001: p. 7
Consequences of the climate change issue

Considering the consequences of the climate change issue there are many similarities in the FCCC’s and the IPCC’s descriptions. The documents from the FCCC give a picture of that the climate change issue is quite alarming, and can be considered as a threat to human populations and natural systems. The climate change is repeatedly described as having adverse and serious effects. In the Convention in 1992 the FCCC argues that adverse effects are:

\[
\text{[…] changes in the physical environment or biota resulting from climate change which have significant deleterious effects on the composition, resilience or productivity of natural and managed ecosystems or on the operation of socio-economic systems or on human health and welfare.}
\]

This description of “adverse effects” points to the fact that climate change can affect both nature and human populations significantly. In 2002 the FCCC argues that the climate change should be regarded as an issue that could endanger future well being, ecosystems, and economic progress in all regions. The FCCC express’ a concern that the climate change can affect future generations, which can be understood as an indication that the climate change issue is perceived as a question that can cause persistent consequences and effects.

The IPCC emphasizes that the climate change is going to be visible through an extensive rise in temperature:

\[
\text{The globally averaged surface temperature is projected to increase by of 1.4 to 5.8°C over the period 1990 to 2100. This is about two to ten times larger than the central value of observed warming over the 20th century and the projected rate of warming is very likely to be without precedent during the last 10,000 years based on paleoclimate data.}
\]

This citation shows that the IPCC argues that there is going to be an extensive warming of the Earth, and that this warming is going to be of historical magnitude. The reports also give a picture of a world where extreme weather events are going to increase, which in turn affect ecological systems and socio-economic sectors:

\[
\text{Models project that increasing atmospheric concentrations of greenhouse gases result in changes in frequency, intensity, and duration of extreme events, such as more hot days, heat waves, heavy precipitation events, and fewer cold days. Many of these projected changes would lead to increased risk of floods and droughts in many regions, and predominately adverse impacts on ecological system, socio-economic sectors, and human health.}
\]

The citation above gives a picture of a rapidly changing climate that could have devastating effects on both ecosystems and society. Furthermore, in the IPCC documents the climate change is frequently described in terms of irreversibility:

\[
\text{[…] some impacts of anthropogenic climate change may be slow to become apparent, and some could be irreversible if climate change is not limited in both rate and magnitude before associated thresholds, whose position may be poorly known are crossed.}
\]

The fact that climate change is described in terms of “irreversibility”, and the climate systems as having “thresholds”, can be seen as an indication of that the IPCC perceive the climate change as very serious. It also becomes clear that the IPCC picture the climate change as an ongoing
process that already has begun, and that there is going to be a change even if a reduction or stabilization of greenhouse gases takes place in the near future.92

I argue that the IPCC describes the climate change as an even more frightening issue than the FCCC does. Both the IPCC and the FCCC emphasizes that the consequences of the climate change can be very long-term and persistent. According to the problem framing perspective, as argued by Rochefort and Cobb, the description of a problem’s magnitude is decisive for how quickly and urgently actions are taken.93 The IPCC’s and the FCCC’s descriptions of the seriousness of the climate change points to the fact that action has to be taken soon. According to Rochefort and Cobb (1994) the terms that are used for describing the consequences could indicate how serious a problem is regarded to be, for example the word “crisis” denotes that the problem requires urgent and extensive responses.94 The IPCC uses several terms that denote the seriousness of the issue, such as “irreversibility”, and the climate system as having “thresholds”.

Another interesting observation made during the analysis was that the IPCC describes the effects and consequences in monetary units.95 This way of valuing the consequences is founded on the belief that damages, on both natural and human systems, can be valued in economical terms. The IPCC argues that monetary units are important for policymakers:

While the underlying measures of welfare have limits and using monetary values remains controversial, the view is taken that the methods to “convert” non-market inputs into monetary terms provide useful information for policymakers.96

This implies, first and foremost, that the IPCC argues that effects on both nature and society can be valued and translated into monetary units. This in turn suggests that the knowledge production and assessments are controlled by expectations, on behalf of the scientific sphere (here IPCC), of what kind of knowledge that they believe that the political sphere regards as relevant and useful (see chapter 2).

The FCCC’s documents emphasize that the consequences of the human-induced climate change are described as being more serious in low-lying countries and developing countries that are already vulnerable. The Conference of the Parties states in 2001 that they:

Remain deeply concerned that all countries, particularly developing countries, including the least developed countries and small island States, face increased risk of negative impacts of climate change.97

The FCCC is, as the citation indicates, concerned of the negative impacts of climate change and the effects that these are going to have on developing and already vulnerable countries. The IPCC describes that the climate change can constitute an obstacle in the process of development, particularly in the developing countries.98 The climate change issue is described as detrimental for the social and economical development for regions and populations already vulnerable. The IPCC also argues that the climate change is going to widen the inequalities even further:

Climate change impacts will affect the prospects for sustainable development in different parts of the world and may further widen existing inequalities. Impacts will vary in distribution across people, places, and times, raising important questions about equity.99

92 IPCC WG I, 2001a: p. 76
93 Rochefort, D. A., Cobb, R. W., 1994: p. 17
94 ibid., p. 17
95 IPCC, 2001b: p. 8
96 IPCC WG III, 2001a: p. 51
97 UNFCCC, 2001: dec. 1
98 IPCC WG II, 2001a: pp. 41-42
99 ibid., p. 21
Furthermore, the IPCC emphasizes that the climate change impacts are going be unevenly distributed and can therefore be perceived as a question of equity.100

**Scientific input in the decision-making process**

The FCCC’s framing of the climate change issue calls for an extensive scientific input in the decision-making process, i.e. the FCCC’s framing makes scientific input in the policy-process essential. Already in the objective of the Convention from 1992 scientific knowledge is given a central role:

> The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.101

As seen in the citation above, the objective is to prevent dangerous anthropogenic interference, but the identification of that level can be problematic. What further complicates the identification of the level is the fact that the prevention should be achieved within a time-frame that makes a continued economic development possible, that allows ecosystem to adapt, and secures food production. This statement also implies that all these goals do not impose contradictions. The FCCC emphasizes in the Convention that the climate change issue is surrounded by considerable uncertainties, in the prediction of climate change, particularly with regard to the timing and the regional patterns of the climate change.102 Moreover, the objective, together with the fact that climate change is surrounded by uncertainties, makes scientific input important in the decision of the actual emission reduction level.

The fact that the stabilization level is not specified, creates a considerable need for scientific input in the decision-making process, to identify the level at which it becomes a “dangerous anthropogenic interference”. According to Rowbotham (1996) the objective can be very difficult to implement and the meaning of the term “dangerous” can vary amongst regions.103 This is further complicated by the fact that different regions and states will experience different impacts and therefore also define the term “dangerous” differently.104 Furthermore, Rowbotham argues that the decision of what is regarded as “dangerous” has to be decided globally, and it is obvious that the objective refers to a global stabilization of greenhouse gases, and not to individual states.105 Prediction of future climate has a central role in the FCCC’s framing of the climate change issue, and the predictability of the climate change issue can be regarded as a perquisite to be able to identify the level at which climate change becomes dangerous.

The analysis shows that the FCCC is very optimistic about the possibility to reduce or eliminate many of the surrounding uncertainties.106 Nevertheless, the FCCC also asserts that the lack of scientific certainty shall not be used as a reason for postponing responses, which the following citation indicates:

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100 IPCC, 2001b: p. 12
101 United Nations, 1992: art. 2
102 ibid., p. 2
103 Rowbotham, E. J., 1996: p. 34
104 ibid., p. 34
105 ibid., p. 35
106 United Nations, 1992: art. 3, § 3
Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures, taking into account that policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost.\footnote{United Nations, 1992: art. 3, § 3}

This argumentation is quite ambiguous since the objective of the Convention requires that there is scientific evidence that the climate change issue is human-induced. The FCCC’s framing consequently relies on the fact that science actually is able to contribute with relevant information during the decision-making process.

The IPCC recognizes that the climate change issue is very complex and that there are lots of irreducible uncertainties surrounding the climate change issue.\footnote{IPCC, 2001a: p. 98} In the IPCC’s framing, these uncertainties depend on several aspects:

\begin{quote}
Some uncertainties arise from a lack of data and a lack of understanding of key processes and from disagreement about what is known or even knowable. Other uncertainties are associated with predicting social and personal behavior in response to information and events.\footnote{ibid., p. 136}
\end{quote}

One of the uncertainties emphasized in the IPCC documents is the magnitude of the warming in relation to a specific stabilization-level of greenhouse gas concentration. This uncertainty affects the possibility to scientifically define at what level of greenhouse gases the interference with the climate system becomes dangerous.\footnote{ibid., p. 98} This uncertainty is, in the IPCC’s framing of the issue, partly due to the fact that the climate change is characterized by inertia, which implies that the effects of the climate change might not be visible until it is too late, and can therefore, not be predicted.\footnote{IPCC, 2001b: p. 16}

As discussed before, the objective of the Convention, and other related documents, is founded on the belief that natural climate variability can be separated from human-induced changes, and that this is a task for the scientific community. The FCCC argues in the Berlin Mandate from 1995 that it perceives the IPCC as an important source of information in the decision-making process, which the following quotation shows:

\begin{quote}
The process will be carried out in the light of the best available scientific information and assessment on climate change and its impacts, as well as relevant technical, social and economic information, including, inter alia, reports of the Intergovernmental Panel on Climate Change. It will also make use of other available expertise.\footnote{UNFCCC, 1995: dec. 1, art. 3}
\end{quote}

The analysis of the IPCC documents points to the fact that the possibility to predict future climate change is limited because of the complexity of the problem and uncertainties that the climate change issue involves. The analysis furthermore indicates that the IPCC argues that the political sphere has to deal with a lot of the uncertainties surrounding the climate change issue.\footnote{IPCC, 2001b: p. 3} This can be further illustrated by the quotation below:

\begin{quote}
Decision making has to deal with uncertainties including the risk of non-linear and/or irreversible changes and entails balancing the risk of either insufficient or excessive action, and involves careful consideration of the consequences, their likelihood, and society’s attitude towards risk.\footnote{IPCC, 2001a: p. 39}
\end{quote}

The IPCC argues that the political sphere has to consider available scientific data as well as society’s attitude towards various risks. The IPCC states that the level of greenhouse gases that
constitutes “dangerous anthropogenic interference” is not known with certainty. Nevertheless, the IPCC argues that there is still a great deal of knowledge that the scientific sphere can contribute with in the policy process, as can be understood from the following citation:

*Natural, technical, and social sciences can provide essential information and evidence needed for decision on what constitutes “dangerous anthropogenic interference with the climate system.” At the same time, such decisions are value judgements determined through socio-political processes, taking into account considerations such as development, equity, and sustainability, as well as uncertainties and risk.*

From this citation it can be concluded that the IPCC perceives the climate change as being a question with both scientific and political answers, and that the scientific and political spheres have to co-operate. In the IPCC framing, the decision of “dangerous anthropogenic interference” is a question that neither the scientific sphere, nor the political will be able to provide a complete and unequivocal answer too. The question has to be decided politically, but with extensive input from the scientific sphere.

Nevertheless, the IPCC gives a quite unclear picture of the opportunities to scientifically define “dangerous anthropogenic interference”. On the one hand, the IPCC states that the climate change issue involves irreducible uncertainties, but on the other hand they give a picture of a growing knowledge base in the area of concern for the definition of “dangerous anthropogenic interference”. For example, the IPCC frequently states that sufficient knowledge “does not yet exist”, which implies that it is just a matter of time before sufficient knowledge is available. The IPCC further explains that scientific evidence helps to reduce uncertainty and increase knowledge. So, even though the IPCC argues that there are a lot of irreducible uncertainties surrounding the identification of “dangerous anthropogenic interference”, the documents all together give a quite optimistic picture of that the scientific knowledge is growing steadily and will continue to grow, also in the area of “dangerous anthropogenic interference”. So, in a policy-making context this could be interpreted as that the IPCC in the future can provide the FCCC an answer to the question of when the climate change becomes dangerous.

In relation to the scientific input in the decision-making process there are a lot of disagreements in the framings given by the IPCC and the FCCC. The FCCC shows an extensive reliance on the scientific input in the decision-making process, which can be seen as an indication on that the problem framing is decisive for what kind of knowledge that is needed. According to Pielke (1997), the definition of a problem can affect the relationship between the scientific and political sphere, and moreover, a definition can provide the scientific community with a connection to policy. The analysis indicates that the FCCC’s framing builds on the traditional model of science and policy relationship, where scientific knowledge can be used in the decision-making process to make it more rational. I argue that the objective of the Convention creates a need for scientific input to enable the implementation of the Convention according to its objective.

The results from the IPCC analysis are more difficult to interpret. My conclusion is that the IPCC describes many of the questions, which the FCCC perceives as relevant, as trans-scientific question. Weinberg (1972) describes trans-science as questions that cannot be answered by science, because of the complexity of the systems addressed or the impossibility of testing the knowledge through usual empirical experimentation. This is true for the IPCC’s description of the climate change issue, but furthermore, it is at the same time argued that many of the

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115 IPCC, 2001a: p. 62
116 IPCC, 2001b: p. 2
117 ibid., p. 22
118 IPCC, 2001a: p. 38
uncertainties could be reduced in the future. Conclusively, this indicates that the IPCC, on the one hand, argues that many of the issues that the political sphere regards as relevant are trans-scientific issues. On the other hand, the IPCC gives an impression that these questions could be turned into scientific questions if the knowledge grows a bit further. The FCCC documents give a very optimistic picture of the possibility to reduce the uncertainties and be able to, on a scientific basis, find out at what level greenhouse gas concentrations should be stabilized to prevent dangerous interferences. This could be regarded as a supportive indication on the theory from Shackley and Wynne (1995), that the political sphere frames the issue in terms of what science might be able to provide in future, and not what the scientific sphere explicitly states they can contribute with.

The IPCC argues that the uncertainty, complexity, and inertia make it necessary to fundamentally change the decision-making process. It is argued that there are several strategies to develop the decision making process, such as hedging strategies and sequential decision making (iterative actions, assessment, and revised action). Also the FCCC recognizes the need for a new approach in the decision-making process, and both of the organizations emphasize that decisions have to be considered and reconsidered in the light of new scientific knowledge. The parties of the Convention recognize that:

> [...] steps required to understand and address climate change will be environmentally, socially and economically most effective if they are based on relevant scientific, technical and economic considerations and continually re-evaluated in the light of new findings in these areas.\(^{121}\)

This indicates that the decision-making process has to be quite flexible in terms of incorporating new knowledge. This also leads to a situation where the decision-making process becomes quite dependent on the information provided by the scientific community. The fact that science and policy is mutually dependent in the addressing of the climate change can be connected to the discourse of ecological modernization. According to this perspective the changing social perception of the environmental problems have made science increasingly entangled in the center of the process of policy-making.\(^{122}\) The concept of “dangerous anthropogenic interference” has many similarities with the term “critical loads” which have been used in the environmental context. This concept means that the level to which a substance should be reduced is dependent on when the substance constitutes a threat for nature or for humans.\(^{123}\) The usage of such concept can, according to Hajer (1997) be regarded as an indication on that the scientific and political communities have become more and more entangled.

**Adaptation and mitigation**

When considering the responses that the IPCC and the FCCC suggest there are many similarities between the two institutions. The FCCC explicitly expresses that the objective of the Convention is to stabilize greenhouse gas concentrations in the atmosphere, and consequently the ultimate response is mitigation. In the prolongation, this leads to the fact that the FCCC focuses on mitigative responses and not so much on adaptive responses. Pielke (1998) argues that adaptation compared to mitigation has not received the same level of attention from either the policy-makers or the researchers.\(^{124}\) Pielke also argues that the fact that the Convention and the FCCC favors mitigative responses is a consequence of the definition.\(^{125}\) However, in more recent

\(^{120}\) IPCC, 2001b: p. 18
\(^{121}\) United Nations, 1992: p. 4
\(^{122}\) Hajer, M. A., 1997: p. 27
\(^{123}\) ibid., p. 27
\(^{125}\) ibid., p. 161
documents the FCCC has paid more and more attention to adaptive measures. In 2002 the
Parties to the Convention state that they are:

Noting that mitigation actions are now taking place both in Annex I and non-Annex I
countries and emphasizing that mitigation of greenhouse gas emissions to combat climate
change continues to have high priority under the provisions of the Convention and that, at the
same time, urgent action is required to advance adaptation measures.\footnote{126}

Furthermore, investigations of adaptive concerns under the FCCC show that adaptation only
were mentioned five times in the Convention but attracted much attention during the seventh
COP meeting in 2002, which also indicates that the attention for adaptive measures has risen.\footnote{127}

The IPCC, gives a picture that both mitigation and adaptation will be needed to deal with the
climate change issue.\footnote{128} According to the IPCC, the best combination of adaptation and
mitigation is decided by, for example, the magnitude of the climate changes. A Greater and more
rapid climate change would pose greater challenges for adaptation.\footnote{129} Another aspect that,
according to the IPCC documents, affects the best combination of adaptation and mitigation is
the inertia in the climate, ecological, and socio-economic systems, which makes adaptation
inevitable and already necessary.\footnote{130} Considering how the relation between adaptation and
mitigation is described, the most characteristic feature is that the cost of adaptive measures is
frequently emphasized, which the following quotation indicates:

Adaptation to climate change has the potential to substantially reduce many of the adverse
impacts of climate change and enhance beneficial impacts, though neither without cost nor
without leaving residual damage.\footnote{131}

Mitigation, on the other hand, is discussed in terms of benefits:

Slower rates of increase in global mean temperature and sea level would allow more time for
adaptation. Consequently, mitigation actions are expected to delay and reduce damages
caused by climate change and thereby generate environmental and socio-economic benefits.\footnote{132}

From the citation above it can be concluded that costs can be reduced and benefits could be
gained from taking mitigative actions. Adaptation, though, is often described as a complement to
mitigation, and not the other way around.\footnote{133} In the IPCC’s framing, mitigative responses have
advantages in relation to adaptation, and the IPCC also gives much more attention to mitigative
responses than to adaptive.

The fact that mitigation is described as advantageous compared to adaptation can be a
consequence of the FCCC’s narrow definition, and that the objective of the Convention only is
focused on the stabilization of greenhouse gases. Also the scientific community (here the IPCC)
can be affected and influenced by social, cultural and political aspects, and ultimately also by what
kind of knowledge they think the political sphere expects from the scientific sphere.\footnote{134} Even
though the IPCC uses a broader definition it focuses on mitigation, which can be seen as an
indication on that the IPCC is affected by the problem definition in the political community, in
this case the FCCC. The fact that both of the institutions focuses on mitigation can also be
regarded as a sign of that the problem definition affects the way a problem is discussed, framed,
and finally probably acted upon. I argue that the respective problem framing of the IPCC and the FCCC have moved a step closer to each other, which is characteristic for the problem definition process as described by Pielke (1997). It is clear that the political and scientific community both have a great deal of influence on each other. The spheres cannot be regarded as strictly separate, as the traditional model suggests. Instead I argue that the model that for example Shackley and Wynne (1995) discusses, about a mutual construction of science and policy, is proven to be more useful to explain the relationship between the scientific and political spheres in the climate change issue.

Response strategies

The conducted analysis shows that there are several similarities in the responses that the IPCC and the FCCC suggest. In the FCCC’s description of the responses the economical aspect is frequently discussed, and the cost-effectiveness of the responses are regarded as an important aspect to consider when taking adaptive and mitigative responses. The FCCC gives in 1997 a very optimistic picture of different responses that are focused on the market and each Annex 1 party shall implement or elaborate policies such as:

- Progressive reduction or phasing out of market imperfections, fiscal incentives, tax and duty exemptions and subsidies in all greenhouse gas emitting sectors that run counter to the objective of the Convention and application of market instruments.

The quotation above, and the discussion in the documents analyzed, shows that the FCCC argues that market instruments can work as effective responses. In the Kyoto protocol it is emphasized that there are major possibilities to elaborate emission trading, within and among countries. This principle can be seen as founded on economic principles, since those who cannot reduce their emission can buy more emission units. Also the IPCC suggests that economical means of control, such as tradable permit systems, have great potential. Furthermore, both of the institutions argue that actions to address climate change can be justified economically in their own right, which indicates that both the FCCC and the IPCC argue that the climate change issue can be economically beneficial.

Technology and technological solutions are stressed as very important in the mitigation of climate change. The development and employment of renewable energy is, in the FCCC’s framing of the climate change, dependent on voluntary targets at a regional and national level, which the following citation from 2002 illustrates:

- Actions are required at all levels, with a sense of urgency, to substantially increase the global share of renewable energy sources with the objective of increasing their contribution to total energy supply, recognizing the role of national and voluntary regional targets as well as initiatives, where they exist, and ensuring that energy policies are supportive to developing countries’ efforts to eradicate poverty.

The citation above indicates that the FCCC argues that both private and public sectors, such as industry, transport, agriculture and forestry, have to address the climate change issue. The IPCC shows an optimism of the development of environmentally sound technology, especially connected to energy consumption and renewable energy sources. This is further illustrated by the following citation:

135 Pielke, Jr., R. A., 1997
137 UNFCCC, 1997: art. 2, § 1a
138 ibid., art. 17
139 IPCC WG III, 2001a: pp. 49-50
141 UNFCCC, 2002: dec. 1
Net emissions reduction could be achieved through a portfolio of technologies [...]. Advances are taking place in a wide range of technologies at different stages of development, ranging from the market introduction of wind turbines and the rapid elimination of industrial by-product gases, to the advancement of fuel cell-technology and the demonstration of underground CO₂ storage.

The citation above indicates that the IPCC is quite optimistic about the technological possibilities to reduce greenhouse gas emissions. Nor the IPCC neither the FCCC pays much attention to responses aimed to change energy-consumption patterns. This together with the fact that the possibilities of technological options is described in such a positive way, by both the IPCC and the FCCC, imply that no major changes in energy-consumption patterns will be necessary in order to mitigate climate change. A special characteristic in the IPCC’s description is that research is perceived as an important part of the responses to the climate change issue. The IPCC frequently argues that expanded research and development will assure continued technological improvement. This is also illustrated by the following citation:

Furthermore, on-going research and development is expected to significantly widen the portfolio of technologies that provide emission reduction options.

Even though the description above indicates that there are a lot of similarities between the responses forwarded by the IPCC and the FCCC there are also several differences. According to the FCCC, legislation and other binding commitments are important measures to take at a national level. The Parties of the Convention states in the Convention 1992 that they are:

Recognizing that States should enact effective environmental legislation, that environmental standards, management objective and priorities should reflect the environmental and developmental context to which they apply, and that standards applied by some countries may be inappropriate and of unwarranted economic and social cost to other countries, in particularly developing countries.

From the quotation above it can be concluded that environmental legislation should be developed, whereas the IPCC does not discusses legislative measures extensively. Also other binding commitments are discussed by the FCCC such as national programmes. These programmes would concern the actors that contribute to emissions of greenhouse gases, such as; energy, transport, industry, agriculture, forestry and waste management. Furthermore, both the private and the public sector should be involved and take initiatives to these programmes. Another special characteristic in the FCCC’s description is the emphasis on educational responses. The educational aspect of climate change is frequently described as a particularly important aspect, and can together with public awareness be understood as important responses. In the Convention it can be read that all parties shall:

Promote and cooperate in education, training and public awareness related to climate change and encourage the widest participation in this process, including that of non-governmental organizations.

This citation indicates that the FCCC perceives public awareness as a necessary part of a successful portfolio of responses. Article 6 of the Convention is dedicated to education, training and public awareness, and there are several commitments that promote educational responses. The Parties shall, amongst other things, promote public access to information and public participation when addressing climate change. Conclusively, the results show that the FCCC
focuses much of its attention on legislation, energy efficiency, public awareness and market based solutions.

The IPCC, on the other hand, argues that there is a need for more fundamental changes in society and its institutions. The IPCC is focused on life-styles changes, and argues that this factor has to be addressed and changed in all countries around the world.

In all regions, many options are available for life-style choices that may improve quality of life, while at the same time decreasing resource consumption and associated GHG emissions.\(^{150}\)

This also implies that the climate change issue cannot be solved under the life-styles patterns that exist today. Furthermore, behavioral changes are described as a necessary element, but requires institutional changes:

Social learning and innovation and changes in institutional structure could contribute to climate change mitigation. Changes in collective rules and individual behaviors may have significant effects on greenhouse gas emissions, but take place within a complex institutional regulatory, and legal setting.\(^ {151}\)

An important aspect in this new institutional setting is greater public participation in the decision-making process and networking among different actors.\(^ {152}\) Another dissimilarity is that the FCCC, first and foremost, discusses responses as single entities. But the IPCC, on the other hand argues that there is a need for a whole portfolio of responses:

The portfolio may include — according to national circumstances — emission/carbon/energy taxes, tradable or non-tradable permits, land-use policies, provision and/or removal of subsidies, deposit/refund systems, technology or performance standards, energy mix requirement, product bans, voluntary agreements, government sending and investments, and support for research and development.\(^ {153}\)

Conclusively, the results of the conducted analysis suggest that the IPCC calls for a much more fundamental change than the FCCC does, even though the IPCC also takes its point of departure in the technology and economy.

In relation the response strategies that the IPCC and the FCCC suggest, there are many connections to the discourse labeled “ecological modernization” as described by Hajer (1997). This is a discourse that recognizes the structural character of the environmental problems, but at the same time assumes that existing political, economic, and social institutions can internalize the care for the environment.\(^ {154}\) Ecological modernization frames environmental problems combining elements from the natural sciences together with monetary units.\(^ {155}\) Both the IPCC and the FCCC take elements from the natural sciences and describe the climate change in relation to costs and benefits, and the IPCC also values the impacts through socio-economic analyses. Furthermore, the ecological modernization discourse is characterized by the fact that environmental protection could be economically profitable, which also is emphasized by both the IPCC and the FCCC.\(^ {156}\) The FCCC clearly emphasizes that a wide participation, with participants from different sectors, both public and private, is necessary to address the climate change. This is also one of the main points in the discourse of ecological modernization, and according to this perspective it is not only the states and their institutions that have to take action, but all of the involved actors.\(^ {157}\) Yet another characteristic in the discourse of ecological modernization is a

\(^{150}\) IPCC WG III, 2001a, p. 21
\(^{151}\) IPCC, 2001a: p. 120
\(^{152}\) ibid., p. 121
\(^{153}\) ibid., p. 110
\(^{154}\) Hajer, M. A., 1995: p. 25
\(^{155}\) ibid., p. 26
\(^{156}\) ibid., p. 26
\(^{157}\) ibid., p. 26
reconsidering of existing participatory principles and acknowledging of new actors, which also is emphasized by both the IPCC and the FCCC.\textsuperscript{158}

The responses that the FCCC discusses have one thing in common, namely the fact that they do not call for fundamental societal changes. The climate change can be handled within the present societal system, but there is a need for stronger commitments, increased economic development, land-use changes, and diffusion of technology and knowledge. The most characteristic feature of the discourse of ecological modernization is that it does not call for any fundamental changes, but instead the solution is an extended modernization.\textsuperscript{159} Even though the IPCC also has very much in common with the FCCC’s perspective, there are also some differences, especially the fact that the IPCC shows that there is a need of more fundamental changes in society and its institutions. This can be regarded as a critique of the society and the fact that the IPCC mainly is a scientific institution makes these kinds of statements quite striking. I argue that this could be regarded as a politicization of science, in the sense that the scientific sphere is concerned and focused on issues that have been regarded as purely political, and that there is a blurring of the boundaries between scientific and political spheres. At the same time it is important to be aware of the fact that the IPCC is an institution set up by the political community.

\textbf{Sustainable development}

One of the most characteristic features of the FCCC’s framing of the climate change issue is that the developed countries are described as one of the causing factors. The FCCC argues in 1995 that the process of addressing climate change should be guided by:

\begin{quote}
The fact that the largest share of historical and current global emissions of greenhouse gases has originated in developed countries, that per capita emissions in developing countries are still relatively low and that the share of global emissions originating in developing countries will grow to meet their social and development needs.\textsuperscript{160}
\end{quote}

This citation shows that the emissions of greenhouse gases in developing countries will have to increase. The IPCC’s point of reference when describing the climatic changes is the pre-industrial era.

\begin{quote}
During the period of the intense industrialization from 1860 to 1997, an estimated 13,000EJ of fossil fuels were burned, releasing 290GtC into the atmosphere, which along with land-use change has raised atmospheric concentrations of CO\textsubscript{2} by 30%.\textsuperscript{161}
\end{quote}

From this quotation the conclusion is made that climate change came with the industrialization. The IPCC argues that development paths have had, and will continue to have, great influence on the climate. This developmental aspect can further be illustrated by the following citation:

\begin{quote}
In particular, the socio-economic and technologic characteristics of different development paths will strongly affect emissions, the rate and magnitude of climate change, climate change impacts, the capability to adopt, and the capacity to mitigate.\textsuperscript{162}
\end{quote}

Furthermore, the IPCC repeatedly describes the climate change issue in relation to GDP (Gross Domestic Product), which is used as a measurement of economic growth, and the IPCC argues that there is a correlation between high GDP and high CO\textsubscript{2} emissions.\textsuperscript{163} Thus, economic growth can through this perspective, be regarded as a cause to the changes in the global climate. The

\begin{itemize}
  \item \textsuperscript{158} Hajer, M. A., 1995: p. 29
  \item \textsuperscript{159} ibid., p. 32
  \item \textsuperscript{160} UNFCCC, 1995: dec. 1, § 1d
  \item \textsuperscript{161} IPCC WG III, 2001a: p. 27
  \item \textsuperscript{162} IPCC, 2001a: p. 41
  \item \textsuperscript{163} ibid., p. 94
\end{itemize}
IPCC discusses and suggests that the causes of climate change are the same as of most environmental problems. This can further be illustrated in the following quotation:

*The primary factors underlying anthropogenic climate change are similar to those for most environmental and socio-economic issues – that is – economic growth, broad technological changes, life style patterns, demographic shifts (population, size, age structure, and migration), and governance structure.*

164

This statement can be seen as an indication on that the IPCC argues that there are structural errors within the contemporary socio-economic system that is causing environmental problems. Furthermore, this description indicates that the climate change issue is the results of ineffective social, economic and institutional conditions. The analysis of the IPCC documents indicates that it takes the point of departure in equity principles and argues that equity has to be the overriding aim for all countries. The challenge of climate change, according to the IPCC’s framing, can also contribute to increased equity, which the following citation indicates:

*Mitigation and adaptation actions can, if appropriately designed, advance sustainable development and equity both within and across countries and between generations. Reducing the projected increase in climate extremes is expected to benefit all countries, particularly developing countries, which is considered to be more vulnerable to climate change than developed countries.*

165

This could occur if the mitigation of climate change makes the developing countries less vulnerable. By reducing vulnerability to climate change, the vulnerability to other issues would be reduced.

The IPCC and the FCCC agree that a sustainable development is the way to solve the climate change issue, and at the same time proceed the development. The IPCC suggests that:

*The climate change issue is part of the larger challenge of sustainable development. As a result, climate policies can be more effective when consistently embedded within broader strategies designed to make national and regional development paths more sustainable.*

166

The FCCC is very clear that it perceives economic growth as a prerequisite to be able to address the climate change issue, which the following quotation from 2002 indicates:

*Parties have a right to, and should, promote sustainable development. Policies and measures to protect the climate system against human-induced change should be appropriate for the specific conditions of each Party and should be integrated with national development programmes, taking into account that economic development is essential for adopting measures to address climate change.*

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This citation further suggests that environmental protection and economic development could be reconciled. The FCCC’s description is are founded on the perception that development can be regarded as the cause to the climate change issue, but at the same time it can be regarded as the solution. Even if both the IPCC and the FCCC describe sustainable development as the main goal, the analysis indicates that they might not perceive and interpret sustainable development in the same way. The IPCC describes that there will be a need of a structural societal change, lifestyle changes and a less detrimental development. The FCCC on the other hand has great faith in that the present societal system only requires small changes to be able to deal with the climate change issue.

I understand the IPCC to be a bit critical of the past development and partly seeing the development (technical, industrial, behavioral and economic) as the cause to the climate change.
This could be regarded as quite strong statement coming from a scientific institution, and it can be seen as a critique of the contemporary societal system. The IPCC’s statements are focused on questions that traditionally have been regarded as belonging in the political sphere. Traditionally the scientific sphere has been regarded as value free and objective, and the political sphere as the one of values, power and persuasion.\textsuperscript{168} The IPCC is widening its area of concern to also include questions that can be regarded as quite “unscientific”, and rather a question of value judgements than of scientific analysis. This could be seen as supportive for the theory that Jasanoff and Wynne (1998) present, of that there are lots of cultural commitments built in to the knowledge production process. In the terms of Weingart (1999a) this could be regarded as a politicization of science, where the scientific knowledge is produced to suit the political purposes.\textsuperscript{169} Even though the question of development can be seen as quite political, the discussion of the question is described by a scientific institution and is in this respect presented as purely scientific in nature. This is, according to Shackley and Wynne (1998) characteristic for the decision-making process when it comes to complex environmental issues.\textsuperscript{170}

\textsuperscript{168} Bäckstrand, K., 2001: p. 56
\textsuperscript{169} Weingart, P., 1999a: pp. 151-153
\textsuperscript{170} Shackley, S., Wynne, B., 1995: p. 220
5. Discussion

The analysis has shown that the IPCC and the FCCC define the climate change issue in different ways, but nevertheless, there are a lot of similarities in the way the issue is framed. The FCCC’s and the IPCC’s definitions differ, but in the practical usage it is the FCCC’s definition that is applied. This indicates that the IPCC’s practical usage has moved closer the FCCC’s definition. In relation to this finding it is important to consider the fact that the FCCC also might have been affected by the IPCC and the scientific sphere. As described in the introduction of the thesis it was the scientific sphere that put the climate change issue on the political agenda, and therefore the problem definition of the FCCC have probably in its early stages been affected by the IPCC and the scientific sphere. It is therefore difficult to draw any conclusions regarding the question if it is the IPCC or the FCCC that have the power in terms of the problem definition authority. The analysis indicates that the model of a mutual construction of science and policy is very useful in explaining the science and policy interface in the climate change issue. Weingart (1999b) argues that the science and politics in the area of climate change is not connected in a linear and sequential fashion but instead they are connected in a much more complex way. Science cannot be regarded as a neutral arbiter delivering factual knowledge to policy-makers, but rather as a participant in the framing of the climate change issue.¹⁷¹

One of the most obvious similarities, between the institutions, is that the descriptions of the climate change issue could be connected to the discourse of ecological modernization as discussed by Hajer (1997). The FCCC, and more specifically the objective of the Convention, is founded on the belief that climate change can be mitigated at the same time that the economic development proceeds in a sustainable manner. IPCC, on the other hand, is more modest in its description of economic development and also emphasizes that structural institutional changes together with life-style changes are necessary. Sustainable development and the global addressing of the climate change issue are recurrent themes in the IPCC’s and the FCCC’s framings. Another similarity is the fact that the climate change issue is described as serious and adverse by both of the organizations. This lays, according to the problem framing perspective, as described in chapter 2, the foundation for a rapid handling of the climate change issue.

The overall characteristic of the IPCC’s framing of the climate change issue is that it is concerned about questions that traditionally have been regarded as quite “unscientific”, such as equity, responsibility and other political goals. This tendency has become stronger and stronger and, according to the IPCC, this is a consequence of a conscious choice to focus on these kinds of questions. The FCCC specifies several principles (equity, common but differentiated responsibilities, precaution, cost-effective measures, right to sustainable development, and support for an open international economic system) which guide the IPCC’s process of addressing the climate change.¹⁷² Furthermore, the IPCC takes its point of departure in the politics in the sense that the objective of the Convention also can be regarded as the objective of the scientific assessments. The content and meaning of these principles can by no means be set objectively, and therefore the scientific sphere also has to give those principles meaning, which implies that the meaning of these terms is co-products of the scientific and political spheres. This can be interpreted as that the political sphere indirectly has had a great deal of influence on the questions that are discussed and analyzed in the scientific reports, and further it could be an indication on that political values have diffused into the scientific sphere.

¹⁷¹ Weingart, P., 1999b: 103
¹⁷² IPCC WG III, 2001a: p. 19
The analysis of the documents from the IPCC indicates that the IPCC in some aspects prescribes how the political sphere should act by relating scientific findings to political goals and values. The scientific sphere is not only regarded as having a role where it strictly should present different alternatives to address the climate change issue, but it also has the task to value different options against others. It does not only present the benefits and disadvantages of different responses but also clearly states which way to go. This gives the impression of the IPCC documents as being a bit prescriptive, in the sense that they do not leave much room for the policy-makers to develop their own opinions. This is quite an interesting finding since the IPCC itself states that the reports should be policy-relevant, but not policy-prescriptive. This could be regarded as an indication of that there is no clear boundary between the scientific and political sphere.

One of the most outstanding findings of the analysis is that the IPCC gives a very unclear picture of what kind of knowledge the scientific sphere can contribute with in the decision-making process. On the one hand, the IPCC gives a picture of an issue that is, and will continue to be, surrounded by considerable uncertainties. On the other hand, it gives a picture that indicates that the scientific sphere in the future also can give answers to “trans-scientific” questions. The FCCC’s definition can be “blamed” for much of the pressure that the IPCC experience. The analysis has shown that the FCCC’s definition could affect the knowledge production in the sense that it gives advantages to a special type of knowledge, mainly that knowledge that focus on anthropogenic changes and the separation between natural and human-induced climatic changes. The IPCC has a responsibility to more clearly show where science ends and policy begins, to use the term of Weinberg (1972). The IPCC has to make clear which questions asked by the political sphere that could be answered fully, or partly by scientific knowledge, and which questions that cannot. The IPCC continues to search for the answer to questions, which might be unanswerable, and gives the FCCC false expectations of what science can contribute with in terms of useful knowledge. Jasanoff and Wynne (1998) noticed that by trying to master trans-scientific questions, false expectations could be given to the political community that the trans-scientific questions could be addressed and answered. Several investigations indicates that the IPCC carries on its research from the expectation that trans-scientific questions can be transformed into purely scientific questions if the scientists collect more data and improve their models. Furthermore, the analysis indicates that there is a mutual construction of the science and policy sphere and that this relationship builds upon the mutual expectations that they have on each other.

I argue that the analysis indicates that there is a politicization of science and a scientification of policy, to use the term of Weingart (1999a), in the sense that the spheres cannot be regarded as strictly separate. Instead there is an extensive blurring of the boundaries and a mutual construction. However, it seems like both the IPCC and the FCCC perceive the relationship between the scientific and political spheres in a traditional sense, where science should provide the political sphere with objective scientific knowledge that could be used in the decision-making process. Both the IPCC and the FCCC need to consider this relationship and evaluate this perception of the science and policy relationship in the context of the climate change issue. A more clearly stated allocation of tasks and area of concerns between the organizations might reduce some of the confusions that the science and policy relationship seems to involve. Moreover, this allocation of tasks and area of concerns have to be developed through a discussion with all of the involved parties. This discussion could preferably also include a discussion about what the IPCC can expect from the FCCC and vice versa, and how the scientific knowledge best can be used in a political context, without being abused. Shackley and Wynne (1995) argues that when research-based knowledge is used in policy-making situations it is

taken out of its original context and interpreted within a new framework. This implies that it is important to consider how scientific knowledge can be used and proven meaningful in a political situation. However, this does not suggest that the scientific and political sphere can be, or should be completely separated in the climate change area. Instead there has to be an awareness of, and a discussion about, that the traditional model might not be able to explain the relationship between the scientific and political spheres, and that the boundaries are more blurred than this model suggests.

Finally, it can be concluded that the IPCC and the FCCC define the climate change issue differently, and that the FCCC’s definition creates a need for extensive scientific input in the decision-making process. However, this does not have to be regarded as a disadvantage, even though it might have caused some confusions and problems. The FCCC and the IPCC work from entirely different, goals, purposes, criterions, and assumptions, and therefore it is also natural that definitions and framings of the climate change issue differ. From this perspective, considering these factors, it would be more surprising if they had the same framing and definition of the climate change issue. Nevertheless, I argue that the FCCC’s definition should be reconsidered, to get by the dependence of scientific knowledge, and there might be need for a reformulation to better deal with the issue and enable actions even under uncertainties. According to Zillman (1997) and Pielke (1998) the fact that the IPCC and the FCCC have different definitions of the climate change issue leads to confusion, and consequently also to considerable difficulties in addressing the climate change issue. This reasoning indicates that the IPCC and the FCCC should have the same definition of climate change, and Pielke (2003) suggests that the FCCC should adopt the definition of the IPCC. Still, it is much more complicated than this. Generally, the problem definition in the political community aims at taking actions to deal with the issue, the problem definition in the scientific community have other goals, and this lays the foundation for divided definitions. To get by this inherent problematique, and still make it possible for the institutions to define the climate change issue from their own perspectives, it is important to actually be aware of the fact that the divided goals have implications on the problem framings and definitions.

Underdal (2000) argues that constructive use of scientific knowledge in the making of climate change policy, require that they find some way to combine the integrity and autonomy of scientific knowledge with responsiveness to the needs of decision-makers for relevant knowledge in the decision-making process. Conversely, it also requires that decision-makers find some way not only to utilize the knowledge that science offers, but also to ask policy-relevant question without ordering particular answers. The political sphere has to recognize and interpret the information that the scientific sphere provides from the perspective of the divided goals, purposes and assumptions and vice versa. Furthermore, it cannot be regarded as a presumption that the scientific evidence can be used directly in the policy-making process. Jasanoff and Wynne (1998) notices that the solution lies in the construction of communities that provide legitimacy through inclusion rather than exclusion, through participation rather than mystification and through transparency rather than black boxing. From this perspective an increased discussion between the IPCC and the FCCC could enable a more effective relationship and communication between the political and scientific community.

175 Pielke, Jr., R. A., 2004
177 Jasanoff, S., Wynne, B., 1998: p. 77
6. Conclusions

There are apparent differences between the FCCC’s and the IPCC’s definitions of the climate change issue. The IPCC’s definition includes natural as well as anthropogenic climatic changes, but the FCCC’s definition only includes human-induced climate change. Nevertheless, the IPCC seems to have accepted the FCCC’s definition in its practical usage and focuses solely on human-induced climatic changes in the running texts. There also appears to be several other similarities in the IPCC’s and FCCC’s framing of the climate change issue. For example, both the IPCC and the FCCC describe the climate change issue as part of a larger challenge of sustainable development and connected to the discourse of ecological modernization. However, in some aspects the IPCC shows a tendency to oppose to the discourse of ecological modernization, when for example the IPCC argues that changes in life-style patterns will be necessary.

The study suggests that the differing definitions and framings used by the FCCC and the IPCC influence the relationship between the scientific and political sphere. There is an apparent linkage between the scientific and political sphere, for example the fact that the FCCC’s definition in itself creates a demand for scientific input in the policy-making process. The results of the study point to the fact that the scientific and political spheres are mutually affected by each other’s definitions and framings of the climate change issue. The knowledge production in the IPCC seems to be affected by the objective of the FCCC’s Convention, which further implies their mutual dependence.
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