

Socialization and Depoliticization of Climate Change Adaptation: shifting adaptation discourses in the 2007 and 2014 IPCC reports¹

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Abstract

With the increasing focus on adaptation in the international climate change debate, this paper argues that the IPCC, in addition to its traditional role in bringing together the top ‘climate science’ and calling to public and decision-maker attention the urgent need for action on climate change, also functions more recently as a forum through which an emerging ‘adaptation science’ is constructed and legitimized. Notably, the actors charged with implementing adaptation projects (e.g. development agencies and NGOs) regularly cite the IPCC as the authoritative source not only on ‘climate science’ and predicted impacts, but also on key conceptual definitions such as adaptation, vulnerability, and adaptive capacity. The IPCC reports thus play an important role in defining what ‘adaptation’ means, with implications for its implementation at the local level throughout the world.

This paper identifies and compares the primary adaptation discourses present within the latest (2014) and previous (2007) IPCC Working Group II reports. Four shifting and competing discourses are identified: technical, managerial, socio-contextual, and critical. Additionally, two important trends in the adaptation debate are highlighted. First, the successive prominence of the socio-contextual discourse, corresponding to greater attention to the importance of social factors influencing vulnerability and adaptation, reflects the increasing role of the social sciences within the adaptation debate. This discourse tends to favor reducing vulnerability through addressing traditional development concerns. Second, a more critical current also supported by social scientists, emphasizing not only the social but *political* aspects of vulnerability and marginalization, is systematically de-emphasized, especially in the more widely-visible Summaries for policymakers.

These parallel processes of socialization and depoliticization of climate change adaptation at the IPCC raise critical questions about how adaptation is being defined by this authoritative source and the increasingly-important if ambiguous role of the social sciences in defining what adaptation means.

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1 Introduction

The undoubtedly most widely-cited sources on any issue related to climate change are the IPCC assessment reports. The reports are composed of contributions from three working groups to cover three main topics: the physical science basis (Working Group I); impacts, vulnerability, and adaptation (Working Group II); and mitigation (Working Group III). The Working Group II contribution, in particular, represents a massive synthesis of available literature on climate change adaptation. This literature has been developing at an amazing pace, and increasingly includes important insights from the social sciences. Likewise, the IPCC reports are increasingly cited as authoritative sources on the subject of adaptation.² Nevertheless, little research to date has addressed the processes through which particular understandings of adaptation gain and or lose prominence, or, in particular, on the role of the social sciences in defining what ‘adaptation’ means. This paper seeks to address this research gap.

The remainder of this paper has been divided into 4 sections. The next section will introduce the IPCC and the IPCC assessment process and examine how it has been conceptualized from a number of different angles in the form of a literature review (Section 2). The following section will briefly present the results of a discourse analysis of the Working Group II Contribution to the IPCC Fourth and Fifth Assessment Reports (hereafter ‘AR4’ and ‘AR5’) and present, compare, and discuss four discourses identified in those reports, demonstrating the ‘multivocal’ nature of the IPCC (Section 3). Two particularly important discourses for the purposes of this paper, a socio-contextual and critical discourses, will be discussed in detail (Section 4). Specifically, it will be demonstrated how these two discourses have evolved between the AR4 and AR5 reports. Additionally, two important trends in the adaptation debate are highlighted. First, the successive prominence of the socio-contextual discourse, corresponding to greater attention to the importance of social factors influencing vulnerability and adaptation, reflects the increasing (but constrained) role of the social sciences within the adaptation debate. This discourse tends to favor reducing vulnerability through addressing traditional development concerns. Second, a more critical current also supported by social scientists, emphasizing not only the social but political aspects of vulnerability and marginalization, is systematically de-emphasized, and can only be identified in fragments scattered throughout the report. (A later version of this paper will take the

² For example, fieldwork related to two climate change adaptation projects in Cusco, Peru demonstrated the importance of the IPCC reports and their definitions in project design and the discourses that project staff use in the everyday implementation of the adaptation projects. How adaptation is defined at the international level clearly influences how adaptation is ‘done’ on the ground.

analysis a step further and examine the IPCC as a site of discursive ‘negotiation’, revealing the process through which particular discourses are ‘organized in’ and others are ‘organized out’ of the IPCC official messages.) The rising importance of the socio-contextual discourse and the continued marginality of the critical one indicate parallel processes of socialization and depoliticization of climate change adaptation at the IPCC. This raises critical questions about how adaptation is being defined by this authoritative source and the increasingly-important if ambiguous role of the social sciences in defining what adaptation means.

Note: For clarity in identifying the specific chapters of the reports, the following citation format used in this paper to chapters of IPCC AR4 and AR5 reports:

AR4_Chx – Chapter *x* from the IPCC AR4 WGII report (IPCC 2007)

AR5_Chx – Chapter *x* from the IPCC AR5 WGII report (IPCC 2014)

Note that the page numbers cited are, as in the report, continuous over the full report, not specific to each chapter.

2 Conceptualizing the IPCC

This section looks specifically at how the IPCC is presented and conceived from a variety of approaches as an introduction to the rest of this paper. Why focus specifically on the IPCC and not, for example, the UNFCCC?³ First, although much public and media attention is often on the UNFCCC and the international negotiations process that takes place at Conferences of the Parties and other climate talks in discussing what to do (or whether to do anything) about climate change, the IPCC has from the beginning played a central if sometimes less visible role in constructing the policy problems in the first place. Indeed, the IPCC, created in 1988, predates the UNFCCC and was in large part responsible for constructing climate change as a global policy problem requiring international coordinated action. The particular construction of the climate problem by the IPCC led directly to the creation of the UNFCCC.

As an illustration of the fundamental importance of the IPCC, it can be noted that not only did the IPCC construct climate change as an international policy problem in the first place, even more fundamentally, through the advent of Global Climate Modeling, the IPCC contributed to constructing the very thing at risk – the ‘global climate’ – at a time when climate had previously been considered as merely ‘average weather’ and largely a local

³ This paper is part of the wider research project Adapt2. Within the framework of this project, the UNFCCC will also be specifically analyzed in depth, but not by this author.

concern (Miller 2004). Similarly but more recently, IPCC reports have contributed to defining and legitimizing particular concepts such as adaptation, vulnerability, and adaptive capacity. In other words, the IPCC may not be the primary forum for discussing the solutions to problems, yet more fundamentally, it is the laboratory in which problems themselves, and sometimes even the very things that are said to be at risk (a ‘global climate’, ‘vulnerable populations’, ‘tipping points’, etc.), are constructed in particular ways. These particular constructions both constrain and enable a particular range of conceivable solutions, and this, at the ‘upstream’ end prior to these solutions even being debated.

Further, the influence of the IPCC and the discourses produced within its assessment reports have wide influence not only upon the UNFCCC process, but also directly upon the agents who put these ideas into practice – the national governments, NGOs, projects managers, and development agencies charged with the task of ‘doing adaptation.’ The IPCC’s influence is derived from its authority to speak on all aspects of climate change, which mirrors and is derived from the authority attributed to science and scientific knowledge in modern society. Though this authority has not gone unchallenged, Hulme and Mahony, in a comprehensive review of different approaches examining the work of the IPCC, summed up the IPCC’s influence:

One thing that nearly all commentators and critics agree on about the IPCC is that it has had a significant influence on climate change knowledge, on public discourse about climate change and on climate policy development. They may disagree about the exact reasons for this influence and whether this influence has always been for the best. (Hulme & Mahony 2010, 712).

The IPCC has thus been chosen for detailed study because its scientific authority regarding climate change gives it undeniable influence, and because of its particular role in defining in the first place the very problems themselves that policy must address.

This section will begin with an identification of the official norms regulating the IPCC assessment process and the way this process is portrayed to the public. A following subsection presents the results of two external reviews of the IPCC following a legitimacy crisis due to errors found in the report in question (though not directly related to adaptation). This will begin to ‘scratch the surface’ of the official image presented by the IPCC. This surface is further scratched, if not shattered, by critiques from the social studies of science (SSS) and other academic literature attempting to understand the IPCC. Ultimately, these different approaches provide some insights but also limitations, permitting the formulation of a number of specific questions that will guide the rest of this part.

2.1 *The IPCC's image of itself – official norms and procedures*

This section explores the IPCC assessment process from the perspective of the formal norms as codified in the official IPCC procedure documents and as presented to the public, before exploring some challenges to the official view of the IPCC in following sections. It serves both as a brief introduction to the IPCC process and as an image of the ‘official view’ of how the IPCC is supposed to operate. Following sections will nuance and critique this official view through contributions from the academic literature.

The official norms governing the aspects of the IPCC assessment process important to this paper can be found in two documents⁴: The ‘Principles governing IPCC Work’ (IPCC 2006) and its Appendix, ‘Procedures for the Preparation, review, acceptance, adoption, approval and publication of IPCC reports’ (IPCC 2003) including its Annex 1 concerning the responsibilities of authors, reviewers, and review editors. These are the documents for internal use by the IPCC that govern its procedures and are agreed by the member countries. Two other documents for ‘external use’ present the work of the IPCC in a more readable form for a wider public: ‘The Preparation of IPCC Reports’ (IPCC Secretariat n.d.) and ‘Statement on IPCC principles and procedures’ (IPCC Secretariat 2010). These four documents have been reviewed here. Three main points will be explored regarding how the IPCC presents and purports to deal with: science, policy and the relationship between the two; controversy and consensus between disparate views; and the summarization process for assessment reports.

Separation of science and policy

The issues the IPCC deals with are by any accounts both scientific and political in nature. Although it is less obvious in English, the name itself at least in French and Spanish means intergovernmental group of experts on climate change, suggesting already a mix of government and experts, policy and science. Yet how does the IPCC itself present and attempt to deal with this ‘dual’ nature of its work? According to the governing principles of the IPCC,

The role of the IPCC is to assess on a *comprehensive, objective, open and transparent* basis the *scientific, technical and socio-economic information* relevant to understanding the *scientific* basis of risk of human-induced climate change, its

⁴ The versions of the two governing documents discussed here are those that were in effect at the time of the writing of the IPCC AR4 report discussed in this and following chapters. They were obtained by personal request from the IPCC Secretariat as they are not available anywhere on the IPCC website. However, the latest versions (IPCC 2012a, IPCC 2012b) are available on the website. According to a careful comparison by the author, despite headings that suggests numerous revisions, the recent versions largely contain the same norms and messages as those discussed in the following section, often even in the same words. In this draft of the paper the norms in effect at the time of the AR4 were used. A later version will use the current IPCC governing documents, as, again, they are in fact nearly unchanged.

potential impacts and options for adaptation and mitigation. IPCC reports should be *neutral with respect to policy*, although they may need to deal *objectively* with *scientific, technical and socio-economic factors* relevant to the application of particular policies. (IPCC 2006, 1, emphases added)

Here, it seems rather clear, through the repetitive use of words like ‘science’, ‘objective’, ‘technical’, and ‘information’, that the IPCC is conceived of as a group of experts who provide policy-relevant yet neutral scientific information to policy-makers. Yet as another document states in introduction, ‘[t]he IPCC is a unique *partnership* between the scientific community and the world’s governments. Its goal is to provide *policy-relevant but not policy-prescriptive information* on key aspects of climate change’ (IPCC Secretariat 2010, emphases added). This already brings up a point of ambiguity regarding the relationship between scientific expertise and political control.

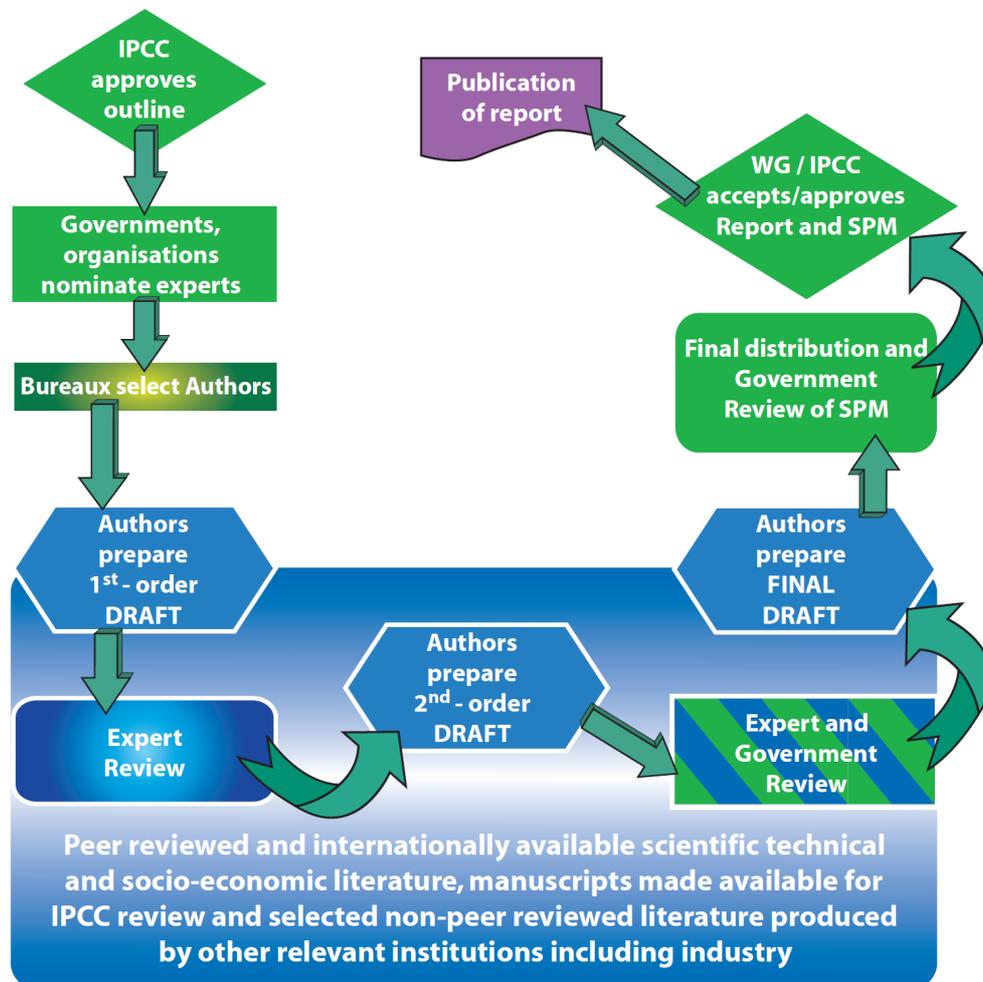


Figure 1 – Illustration by the IPCC Secretariat of the official IPCC procedures for preparing reports, including assessment reports (IPCC Secretariat n.d.). WG is Working Group, SPM is Summary for Policymakers.

Another document for the public provides a colorful schematic presentation of the IPCC assessment process (Figure 3.1). Although the figure comes with no legend, it seems

that green refers to governments and the sphere of policy, and blue refers to experts and science. If this is the case, it appears that the IPCC approves the outline for a report in the beginning of the process and approves the final report at the end but is altogether separate from the expert authors who actually prepare the reports. This places the IPCC on the ‘side’ of policy/government. These may seem like rather pedantic questions, but it is important to point out that there is a fundamental ambiguity surrounding the IPCC that the IPCC itself neither resolves nor even clearly identifies in its formal governing documents or in the more lay-oriented presentations.

Through color-coding, the image suggests that the worlds of policy and science, despite their interaction, maintain relatively pure boundaries and distinct roles in the IPCC assessment process. Except for the uneasy-looking green-blue ‘Expert and Government Review’ box, science and policy are, apparently, kept in separate domains. This clear distinction is emphasized by the way the assessment is said to be produced and the kind of information that the assessment provides. This assumes a particular understanding of how scientific knowledge is produced. This is actually explicitly spelled out for us:

The essence of science is testing interpretations against observations, and gradually building a body of knowledge that is consistent with all of the observations and experiments. The main motivation for doing an assessment is assembling all of the available information to see how the pieces fit together, what key themes emerge, and what once-promising hypotheses ended up not being consistent with new observations. A careful assessment is a powerful tool for transforming a huge body of science into the kind of knowledge that can support well-informed policy choices. (IPCC Secretariat 2010, 2)

The IPCC presents the assessment process as amassing building blocks of scientific facts. Scientific knowledge according to this model is treated in a very uncomplicated manner. In the official view, on almost every occasion the assessments and the information they contain are qualified in terms like objective, scientific, technical, neutral, factual, expertise (IPCC 2006, 1; IPCC 2003, 7; IPCC Secretariat 2010, 1; IPCC Secretariat n.d., 2). The assessments provide, ‘policy-relevant but not policy-prescriptive information’ (IPCC Secretariat 2010, 1). The underlying assumption is that policy asks a question, and objective scientific experts respond with neutral facts. This reinforces the model of the IPCC process whereby science and policy live in separate domains and maintain well-defined boundaries. The official model presented here has been critiqued by a number of scholars and will be further explored in the rest of this section. First, two other official norms characterizing the assessment process are identified.

Consensus and controversy

The IPCC, like other international organizations, is based on a consensus decision-making model. Yet it must be noted that the official procedures of the IPCC clearly indicate when consensus-based decision-making must be made and when, on the contrary, differing views must be highlighted rather than subsumed into a consensus view:

In taking decisions, and approving, adopting and accepting reports, the Panel, its Working Groups and any Task Forces shall use all best endeavours to reach consensus [...] Differing views on matters of a scientific, technical or socio-economic nature shall, as appropriate in the context, be represented in the scientific, technical or socio-economic document concerned (IPCC 2006, 2).

The two halves of this quote clearly show that there are two official norms – for the decision-makers (government representatives making up the Panel, Working Groups, and Task Forces) the norm of consensus-making must be applied, whereas for the authors (scientists), differing views must be recorded. Indeed, in the specific procedures for the writing of assessment reports by the scientific authors, there is no mention of a requirement for consensus. On the contrary, ‘[i]n preparing the first draft, and at subsequent stages of revision after review, Lead Authors should clearly identify disparate views for which there is significant scientific or technical support, together with the relevant arguments’ (IPCC 2003, 5). Further, in the preparation of the final report it is reiterated that, ‘[i]t is important that Reports describe different (possibly controversial) scientific, technical, and socio-economic views on a subject, particularly if they are relevant to the policy debate’ (IPCC 2003, 7). The existence of two sets of official norms, consensus-making for the policy-makers and documenting controversies for the scientists, reflects once again the perceived separation of the worlds of science and policy (separate worlds, separate norms), as well as the perceived neutrality of science (‘differing views’ should simply be documented, not debated until consensus is reached).

This official norm for the ‘scientific half’ of the IPCC requiring the inclusion and explicit treatment of a diversity of views and of any controversy between them, especially those relevant to policy, is further reinforced and codified in a number of ways, including in the way authors and editors are to be chosen and in their specific responsibilities. According to the official procedures, the authors themselves should be selected in the first place to reflect, ‘the need to aim for a range of views, expertise and geographical representation’ (IPCC 2003, 5). Two review editors⁵ for each chapter are selected to ensure, ‘a balanced and complete

⁵ The number of review editors required by the procedures has been increased to ‘two to four’ (IPCC 2012b, 6) in order to avoid ‘errors’ like that related to the Himalayan glacier retreat ‘scandal’. In reality, despite the official norm, the IPCC AR4 WGII report implicated already employed two or three review editors per chapter.

assessment of current information’ (IPCC 2003, 6) and the review editors themselves should be chosen to ‘aim for a balanced representation of scientific, technical, and socio-economic views’ (IPCC 2003, 6). Apart from regulating the choice of authors and editors, this norm is further specifically inscribed in the more specific, ‘tasks and responsibilities’ of lead and coordinating lead authors as well as of review editors. Specifically, ‘Lead Authors are required to record in the Report views which cannot be reconciled with a consensus view but which are nonetheless scientifically or technically valid’ (IPCC 2003, 11). Likewise, it is the responsibility of review editors to, ‘advise lead authors on how to handle contentious/controversial issues and ensure genuine controversies are reflected adequately in the text of the Report [... and] need to ensure that where significant differences of opinion on scientific issues remain, such differences are described in an annex to the Report’ (IPCC 2003, 12-13).

In other words, according to the governing principles and procedures, as a general norm and as specific regulatory norms determining the choice of and responsibilities of authors and editors, politically controversial views *must* be addressed in assessment reports. This norm is likewise reiterated in several places in the more public-oriented documents. (e.g. IPCC Secretariat n.d., 2, 3; IPCC Secretariat 2010, 1, 2). In some places the norm is rephrased more affirmatively; instead of stating how the assessment process ‘should’ work they state that the process actually *does* work this way. For example, the ‘first component of an IPCC assessment is that all of the relevant literature is considered, whether or not it agrees with the dominant paradigms’ (IPCC Secretariat 2010, 1). In short, the official norms codified in the principles and procedures of the IPCC explicitly require that differing views be expressed. There is in fact no requirement whatsoever that authors come to a consensus view on any aspects of climate change or response measures, on the contrary. This point has been emphasized here at some length because it will be shown in later sections that this official norm of encouraging and reporting on a diversity of perspectives, and the emphatic assertion that the norm is followed, are at direct odds with the an empirical analysis of how the assessment process actually works.

Summarization – how science for policy messages are constructed

A third aspect of the assessment process of interest here is the conceptualization of the process of ‘summarization’ that takes a number of different forms in the assessment process. First, the assessment process itself is conceived of as a sort of massive summary or literature review of all pertinent knowledge on climate change. Authors ‘synthesize large bodies of

literature' (IPCC Secretariat 2010, 1) to produce a 'comprehensive, objective and balanced' (IPCC 2003, 2) assessment. The assessment report itself is then summarized into a Technical Summary and further into a shorter Summary for Policymakers (SPM). The SPM is an important result of the assessment process. As the name implies, it is specifically directed to policy-makers, and according to the official procedures, 'provides a policy-relevant but policy-neutral summary' (IPCC 2003, 2). Given that, for example, in the IPCC AR5 report the Working Group II contribution alone is 1820-pages, it could be surmised that the SPM of this report, at 32 pages, receives significantly-wider readership. The assessment process itself specifically assigns particular importance to the SPM through the much more elaborate review process that it entails. In IPCC terminology, the SPM is 'approved' while the full report is merely 'accepted' (IPCC 2003, 2). While chapters of the full report are reviewed twice by experts and once by governments, the SPM is reviewed once by experts (although the underlying report will have already been reviewed once beforehand by experts), twice in writing by governments, and finally is subjected to a 'line-by-line approval' in a plenary meeting of the Working Group (IPCC 2003). This means that government representatives actually gather in person to discuss every detail of the SPM over the course of a week of negotiations (for the AR4 WGII negotiations see e.g. Gutiérrez 2007).

The previously discussed norm governing the scientific authors' work of documenting controversies carries over to this discussion in the sense that the assessment report is required and assumed to be an accurate and objective representation of the 'underlying' literature. Each stage of summarization is likewise required and assumed to represent the previous stage. The SPM, then, is presented as an accurate and objective representation of the entire literature reviewed.

The integrity in the IPCC assessments and their *fidelity to the underlying scientific information* comes from four main components, all thoroughly specified in the IPCC procedures. These are (1) broad, balanced participation in the author teams, (2) emphasis on a comprehensive treatment of the relevant scientific literature, (3) two stages of widely distributed, independently monitored review, and (4) word-by-word, consensus approval, by governments, of the Summaries for Policymakers. With each component, important features help ensure high fidelity to the underlying science and minimal opportunity for messages to be shaped by the views of one or a few individuals. (IPCC Secretariat 2010, 1-2, emphasis added)

Not only, then, is the SPM the final product of the assessment process, faithfully representing the report (which faithfully represents the 'underlying scientific information', which is supposed to represent everything science has to say about climate change), but the consensus-based approval by governments is said to be one of the main ways this 'fidelity' is achieved.

‘Approval of the Summary for Policymakers at the Session of the Working Group, signifies that it is consistent with the factual material contained in the full scientific, technical and socioeconomic assessment’ (IPCC 2003, 7; see also IPCC Secretariat n.d., 2; IPCC Secretariat 2010, 1). Whereas some might fear that consensus-based approval of the SPM by government delegates might be an *opportunity* for ‘messages to be shaped by the views of one or a few individuals’, the IPCC claims that it is precisely this process that *ensures* that this does not happen. Further, once the SPM is approved by governments, ‘[c]hanges (other than grammatical or minor editorial changes) made after acceptance [of the underlying report] by the Working Group or the Panel shall be those necessary to ensure consistency with the Summary for Policymakers’ (IPCC 2003, 4). That is, the government-approved message of the IPCC, the SPM, becomes the ultimate measure of truth to which the rest of the report must be ‘made consistent’ (through so-called ‘trickleback’), not the other way around.

A particularly vivid image of the summarization process is given in a public-oriented document that interprets the procedures for the reader. Again, once ‘all of the relevant literature is considered, whether or not it agrees with the dominant paradigms’ (IPCC Secretariat 2010, 1),

the information from all of this literature is distilled into key messages that capture the state of knowledge at the time of the assessment... A collection of pyramids might serve as a useful analogy for the structure of an IPCC assessment. A huge array of studies forms the base of each pyramid. Moving to higher levels, the information is increasingly distilled and qualified with appropriate confidence levels. For the IPCC, the top level is the key messages that appear in the Summaries for Policymakers. (IPCC Secretariat 2010, 1)

This ‘pyramid’ view of the assessment process, along with words like ‘synthesize’ and ‘distill,’ suggest a rather simple image of the successive stages of summarization, as if each stage is a ‘mere’ summary of the previous stage, tracing faithfully all the way back to the original source scientific literature. Nowhere is any criteria stated on how to decide what should go in to a summary and what gets left out. This is in fact consistent with the conceptualization of summarization as ‘distilling.’ If summarizing is distilling, a large body of scientific facts can be reduced to their ‘essence’ without, apparently, anyone having to make any tough decisions about what gets filtered in and what gets filtered out. According to this image, the actual people involved in the process, let alone their likely disparate views and interests, ostensibly play no role in the workings of the pyramidal distillery of scientific facts. This point is emphasized here because it will be shown further on that the successive stages of

summarization is a major way in which some views are organized in to the official message of the IPCC, while other views are organized out.

This brief review of the formal norms regulating the IPCC assessment process and of the way this process is presented to the public reflect both the way the process ‘should’ work and the way the IPCC claims that it actually does work. Three claims important to the following discussion were identified: that science and policy inhabit separate domains in which the assessment process allows objective science to provide neutral expertise to policymakers, that the assessment process ensures that the full diversity of views are expressed and controversies are documented, and that the consecutive summarizations are representative, merely ‘distilled’, versions of the full report and of the ‘underlying’ scientific information. The following sections nuance and challenge this official model of how the IPCC operates.

2.2 The IPCC and ‘science-policy’ from the perspective of social studies of science (SSS)

Given the limitations of the ‘official view’ promoted by the IPCC where should we turn for a useful conceptualization of the IPCC and the assessment process? It is suggested that the social studies of science (SSS)⁶ literature can offer some contributions, with its explicit focus on the relationships between science, technology, society, and policy-making. This section will demonstrate how SSS scholars have critiqued the IPCC as relying on and promoting a ‘linear model’ of science-policy interaction whereby science and policy inhabit distinct worlds. This model has a number of limits and consequences, namely: it is based on the assumption that scientific consensus is a necessary and sufficient condition for political consensus, it portrays science as value-free, and in practice it leads to obscuring value-based controversies behind the language of scientific uncertainty. It will be shown how the model nevertheless persists as it provides some benefits to those who employ it, namely it confers authority on scientists and policy-makers alike. This authority is however not uniformly shared, as a hierarchy of sciences is identified among the scientists who contribute to ‘climate science.’ A final sub-section will demonstrate that while these contributions of the SSS literature are necessary for understanding the IPCC, they are limited in that they do not examine, though they may be relevant to, the theme of adaptation or the role of the social sciences in the production of climate change-related knowledge.

⁶ There is considerable overlap between the terms ‘science studies’, ‘social studies of science (SSS)’, and ‘science and technology studies (STS).’ They will not be distinguished in this work, and the term ‘social studies of science (SSS)’ will be used to refer generally to all of this literature, probably in conflict with how some of the authors within these fields would define them. See Jasanoff (1996, footnote 2).

The linear model of science-policy at the IPCC, scientific consensus for policy consensus

To begin with, an underlying theme that unites the different analyses of the IPCC relates to its dual function as a center for the production of scientific knowledge and its ‘policy relevance.’ As it was described above, the IPCC itself essentially describes the process through which science and policy interact as a linear relationship: science produces knowledge, which is then handed over to policy makers, who must then make the best, ‘science-based’ decisions. This supposes a hermetic separation of science and policy.

In the SSS literature, this simplistic view of the relationship between science and policy has been labeled the ‘linear model’ (e.g. Pielke 2007; Beck 2011), or ‘speaking truth to power’ (Jasanoff & Wynne 1998). Conceiving of the relationship between science and society according to the linear model, and attempting to apply this model in everyday work (that is, using it both as a description of how the relationship between science and society *is* and *ought* to work) has a number of important consequences that are highlighted by this literature. This literature suggests that while the IPCC strives to follow the linear model in practice, it is neither useful as an analytical tool for how the IPCC actually operates nor an ideal model for how it should operate, and that the IPCC’s attempt to follow and portray this model has a number of consequences. As Roger Pielke, Jr. put it,

the so-called “linear model” of the relation of science and society where consensus on science is a necessary and sufficient precursor to achieving a political consensus is not always (and less generously, perhaps rarely) an effective guide for scientists seeking to play a positive role in the policy-making process. Yet, the linear model exerts a strong hold on many scientists and policy-makers as a model for thought and action. (Pielke 2007, 77)

Central to this model then is a heavy emphasis on generating scientific consensus in the hopes that this will compel political consensus and action. According to this model, the ‘influence of science on policy is assumed to be strong and deterministic: if the scientific facts are “sound”, then they have an immediate, direct impact on policy. It is scientific consensus that determines and thus drives political decision-making’ (Beck 2011, 298). The model thus portrays and is based on ‘science as a harmonizing force’ (Beck 2011, 298-299). Others had already noted that the drive for consensus was central to the IPCC since the early reports:

The IPCC leaders’ actions were dominated by an overriding concern to generate a global consensus on the nature and magnitude of climate change risks. Furthermore, the IPCC was concerned not only with scientific but with policy consensus. It thus spent enormous energy on negotiating policy summaries of the science. (Jasanoff & Wynne 1998, 36)

(This last point highlights the importance of the SPM and of the process of ‘summarization’ in transforming a scientific consensus into a political one.) In other words, according to the linear model which the IPCC attempts to operationalize, science and policy are conceived as wholly separate worlds; scientific consensus is produced in the ‘world’ of science and is then communicated to the separate ‘world’ of policy, where the force of the scientific evidence is supposed to incite the appropriate political response.

An empirical example of how this assumption operates within the IPCC and the results it produces is given by O’Reilly et al. (2012). Through interviews with IPCC authors involved, they questioned how and why a scientific consensus was presented in the Third Assessment Report concerning the West Antarctic Ice Sheet’s possible contribution to sea-level rise while no estimate at all was presented in the Fourth Assessment. They found that this ‘sudden collapse of consensus’ was largely because new findings had increased scientific uncertainty and a diversity of views then existed.⁷ Unable to come to a consensus, IPCC authors chose to present no estimate whatsoever rather than a range of conflicting views or an exploration of the nature of the controversy (O’Reilly et al. 2012). This shows not only the importance of consensus as a driving force, but a tendency to remain silent on rather than highlight scientific controversies. Elsewhere it has been suggested that in general, ‘the heroic efforts to generate consensus have resulted in a monolithic corpus of knowledge in which many key variations, conflicts, and complexities, in both the natural and social domains, have been rendered virtually invisible’ (Jasanoff & Wynne 1998, 71). In sum, these authors suggest that the IPCC, in contrast to the officially-stated norm by which controversies must be highlighted, in actual practice, follows an altogether different informal norm emphasizing the importance of scientific consensus for the sake of encouraging policy action. According to this norm, in the case of controversial findings, the IPCC would present either a strong consensus message, with the risk of glossing over the actual diversity of scientific views, or no statement at all.

Beyond ‘uncertainty’ - Controversy over facts and over values

According to Pielke, the linear model runs into serious problems whenever the ‘decision context’, in this case the socio-environmental problem of climate change, is characterized by high uncertainty in the scientific knowledge and/or fundamental conflicts of values regarding the problem and solutions (Pielke 2007; cf. Funtowicz & Ravetz 1993).

⁷ Pielke (2007, 66) likewise argues that scientific progress often leads to increased, not decreased uncertainty (contrary to the assumptions of the linear model), which leads to calls for even more scientific progress to reduce uncertainty, while the underlying value-based conflicts truly at the center of debate go unaddressed.

Taking the case of the debate⁸ over climate change in the United States media, Pielke shows how arguments for and against taking action on climate change in the form of the Kyoto Protocol, an inherently value-based or normative question, were couched in the language of a debate over the uncertainty of climate science, a fact-based positive question (Pielke 2007, 116-134). In other words, while climate change is in fact one of these complex decision contexts characterized by both high scientific uncertainty and divergent values, the debate itself focused only on the first while leaving the second unaddressed. In other words, ‘according to the dominant narrative, policy conflict, or lack of authority and political commitment in “science-led” policy domains is due to scientific uncertainty; hence its reduction will reduce the policy uncertainty’ (Shackley & Wynne 1996, 278). The common perception that the linear model encourages is that a lack of political consensus stems from a lack of scientific consensus, and this in turn comes from scientific uncertainty (controversy over scientific facts), and not from controversy over values. Of course, in the first place, the IPCC’s recurring assertion that it provides ‘policy relevant but not prescriptive’ assessments portrays science as value free, neutral, and independent from policy (Beck 2011, 299). Thus, the debates over climate change have heavily focused on downplaying or highlighting (depending on the political position of the speaker) scientific uncertainties in the climate science, while leaving unaddressed the more fundamental value conflicts regarding whether and how climate change ought to be defined, addressed or prioritized, and ultimately, what kind of a world we want to live in.

Unfortunately, mirroring the political debates (portrayed as scientific debates), the STS literature has likewise focused on scientific uncertainty in climate science rather than questions of values. This work has taken various forms including addressing the perception of uncertainty in climate science by different producers and users of knowledge (Lahsen 2005) and the use of uncertainty language and representations across the science-policy interface (Shackley & Wynne 1996). Tellingly, one useful and otherwise relatively complete review of different perspectives on the nature of the IPCC and the knowledge it produces (Hulme & Mahony (2010) dedicates a section to ‘consensus and uncertainty.’ This work opposes and contrasts these two concepts, and proceeds, following the trend in the literature, as if the only opposite of consensus is uncertainty, a controversy over facts, leaving unmentioned the

⁸ In the early 2000s in the mainstream US media, the words climate change or global warming almost never appeared except when accompanied with the word ‘debate’ and rarely accompanied with the word ‘problem.’ This was despite the wide public consensus elsewhere and the wide scientific consensus on anthropogenic climate change among US scientists who are primary contributors to the science of climate change.

possibility of a lack of consensus stemming from a difference in values (Hulme & Mahony 2010, 710-712).

A few exceptions to the values blind-spot can nevertheless be highlighted. In the case of the IPCC and climate science in general the ‘value free’ nature of climate science has been challenged in various ways. Demeritt (2001), for example, demonstrates how values enter climate science at the ‘upstream’ end, influencing the questions asked and the methods applied, not the least important result of which is the how the particular ‘scientific framing of climate change as a global-scale problem caused by the universal and hence predictable physical properties of GHGs has reinforced, and been reinforced by, the technocratic inclinations of an emergent international regulatory regime’ (310). Miller (2004) likewise shows how the growing emphasis on the particular practice of climate modeling was an historically contingent step in the ‘globalization’ of climate, of climate change science, and of the scale of imaginable policy solutions. In other words, this work highlights the constructed nature of environmental problems, that the particular framing given to a problem is not a solely scientific question and the way it is defined ultimately influences the range of possible policy solutions (Hajer 1997). In reviewing a number of alternative approaches to understanding the relationship between science and policy, Jasanoff and Wynne conclude that: ‘this body of work calls attention to the fact that social and cultural commitments are built into every phase of knowledge production and consequent social action, even though enormously effective steps are often taken to eliminate the traces of the social from the scientific world’ (Jasanoff & Wynne 1998, 16).

To sum up thus far, the linear model contains three basic assumptions: science can and must be presented as a consensus view, science is value-free, and, therefore, any lack of consensus must stem from uncertainty (controversy over facts) and not controversy over values. These issues have been explored briefly by the literature cited above, but only in the case of issues related to the natural sciences (global climate modeling, the existence of the climate change problem itself, mitigation policies). Indeed, the SSS literature cited above, and indeed more generally, has almost always meant the social study of *natural* science, leaving unexamined the ways in which social scientists produce knowledge. Two important points in particular that are missed by this literature are the difference in the nature and function of controversy/consensus and the role of values between the natural and social sciences. As illustrated above in example of the ‘collapse of consensus’, when there is no consensus in the natural sciences it is generally attributed to ‘uncertainty.’ That is, within the positivist paradigm in which the natural sciences operate, if different scientists using different methods

come up with different explanations for the same physical reality, necessarily at least one is simply wrong, as there is only one physical, underlying reality. In other words, controversy reflects uncertainty, an unknown, yet an unknown that is presumed nonetheless knowable by (improved, future) science. On the other hand, the social sciences, (working, in the first place from a number of different epistemologies!) more often deal with explicitly normative issues. Controversy, or lack of consensus, in this case does not reflect ‘uncertainty’ about an objectively-knowable truth, but a difference in explicit or implicit value-based assumptions. In other words, on the one hand, controversy means ‘we don’t know – yet’, whereas on the other, it means, ‘we disagree – and maybe we always will.’ Accordingly, consensus on the one hand means ‘this is the best explanation science can offer’, on the other, consensus between inherently different value-based positions is difficult to imagine. While Clifford Geertz argued for anthropology as ‘a science whose progress is marked less by a perfection of consensus than by a refinement of debate’ (Geertz 1973, 29),⁹ this may be true of the social sciences more generally. Unfortunately, as stated above, the SSS literature tells us nothing about the nature of how consensus and controversy from inherently different value-based positions are handled within the social science contributions to the IPCC assessments, which are precisely those that concern adaptation the most. One aspect of this paper will be to attempt to fill this gap through an empirical analysis of the role of the social sciences in the IPCC AR4 and AR5. But first, other insights from the SSS literature can be collected, although this neglect of the social studies of *social* science will be a recurring theme.

The politicization of science – disguising value-based controversies as fact-based ones

As the literature cited above argues (see especially Pielke 2007, 70-74), when there is a values conflict, and the linear model is applied, the conflict is couched in scientific language and debated as if it were due to scientific uncertainty, leaving the underlying value conflict unaddressed. This leads to what has been called the ‘politicization of science’ or ‘proxy debates’ (Pielke 2007; Beck 2011; cf. Hulme 2010).

From the perspective of the linear model, science not only plays a (if not the) central role in political battle, but because scientific understandings are supposed to motivate political action, winning a scientific debate leads to a privileged position in political battle. Consequently, scientific debates *are* in effect political debates because resolving scientific debates will resolve political conflicts. Science thus becomes a convenient

⁹ He added, more humorously: ‘What gets better is the precision with which we vex each other’ (Geertz 1973, 29). It should be noted that in Geertz’s conception this does not imply that all perspectives are equally valid (extreme relativism); he suggests that they can be judged through a process of ‘appraisal’ (if not ‘verification’) (*ibid.* 18).

and necessary means for removing certain options from a debate without explicitly dealing with disputes over values... For who can argue against truth? (Pielke 2007, 124-5, emphasis in original)

Science thus becomes the ultimate resource for supporting one's political position. This phenomenon has been particularly present in the case of climate change (Pielke 2007, 70-74). In the everyday functioning of the IPCC in particular it is suggested that 'proxy debates',

invite all the parties involved to smuggle their political preferences into the scientific debate so that the IPCC almost automatically internalizes both technical and political conflicts latent in controversies and faces the challenge of resolving them. Disagreements that [are] present[ed] as disputes over scientific evidence are in fact rooted in more fundamental differences regarding epistemology, values, or the role of science in policy making. (Beck 2011, 303)¹⁰

Although Beck does not make it clear who exactly is responsible ('all parties'?) for 'smuggling' values into the debates nor how the process occurs ('almost automatically?'), Pielke specifically demonstrates that both policy-makers and scientists themselves are responsible for carrying out debate over an inherently values-based controversy as if it were only about scientific uncertainty (Pielke 2007, 117-134). Scientists who are involved in the politicization of science and promote or support particular value-based positions, all the while relying on the image of scientific neutrality, are labeled 'stealth issue advocates' (as opposed to overt 'issue advocates', 'pure scientists', 'science arbiters' or 'honest brokers') in Pielke's nomenclature of the diverse roles scientists can (explicitly or implicitly) choose when engaging with policy (Pielke 2007, 1-21). Again, this has only been demonstrated in the case of the politicization of the natural sciences (perceived, perhaps, as the most 'value-free') and of related issues of climate change as a physical problem itself, not in the case of the social sciences and of issues related to adaptation.

If the linear model of science does not give an accurate view of science and policy, why is it applied by institutions like the IPCC? The linear model, again, assumes and asserts that science and policy are separate domains, that science is value free, and that good policy is based on good science. Miller (2004) argues that the IPCC in particular derives much of its scientific credibility and political authority from projecting an image of the clear-cut separation between science and policy, in particular, as manifested in the distinction between

¹⁰ Unfortunately, Beck (2011) does not describe how this process of 'smuggling' actually works, as is emphasized by the vague term 'almost automatically internalizes.' This is due to the limitations of that work which, although attempting to address this specific issue of politicization of science in the case of adaptation (a much-needed contribution), Beck (2011) ends up giving more of a schematic review rather than an empirical analysis. Pielke (2007), on other hand, who does give an empirical blow-by-blow of a particular aspect of the climate change debate in the United States following the publication of a particularly skeptical work, unfortunately does not mention the issue of adaptation whatsoever anywhere in his book.

its three working groups (I - physical science, II - impacts, III - responses)¹¹ – separated on a spectrum from the ‘neutral’ (physical) sciences to the value-laden questions of policy responses. Similarly, the creation of the UNFCCC as the more ‘political’ body allowed a further ‘purification’ of the IPCC and was quickly followed by extending the ‘scientific’ procedures and peer review process, initially applicable only to Working Group I, to Working Groups II and III (Miller 2004). Science’s political power comes precisely from its purported neutrality. This widely-led perception means that anyone who can speak in the name of science, be they scientists themselves or policy-makers supported in making ‘evidence-based’ policy, holds considerable authority. According to Pielke (2007, 126-131) these are precisely the advantages of the linear model for those who assert its relevance; it confers authority on scientists and policy-makers alike. In this sense, much of the debate about climate change could be seen not only as a debate over scientific claims that support and obscure normative claims, but also as a debate about who has the authority to make these claims – to say how the world is, and how it ought to be.

An alternative model – the IPCC as a ‘boundary organization’?

In critiquing the simplistic linear model of science-policy, a number of alternative models have been proposed to attempt to better analyze the reality, and not just the common portrayal, of the science-policy relationship, and the IPCC in particular (Jasanoff & Wynne 1998 provide a brief overview of several approaches). Probably the most widely-employed approach in the SSS literature is to consider the IPCC a ‘boundary organization’ that exists on the interface between science and policy (e.g. Bassett & Fogelman 2013; Hulme and Mahony 2010; Forsyth 2003, 143-5). Indeed, Forsyth (2003) takes the IPCC as the (literally) textbook example of a boundary organization. He defines boundary organizations as ‘social organizations or collectives that sit in two different worlds such as science and policy, and can be accessed equally by members of each world without losing identity [... T]hey provide sites where different epistemological networks may unite’ (Forsyth 2003, 141). Boundary organizations are understood as sites of the coproduction of science and policy that operate through establishing common norms between scientific and political actors, working through scientific and political controversy to arrive at problem closure, and producing definitions and knowledge that are treated as ‘facts’ (ibid. 141-142). In other words, as compared to the linear

¹¹ This reflects the original division of the three working groups. Currently, Working Group II includes impacts, vulnerability and adaptation, while Working Group III focuses on mitigation. The linear progression from ‘hard science’ to ‘soft’ is however more or less maintained.

model of science in which scientific knowledge production and policy's use of that information are considered separate processes, the boundary organization concept would encourage us to see climate science and policy at the IPCC as the coproduction of knowledge, overlapping processes between two 'sides'.

The boundary organization concept attempts to bring together and respond to many of the critiques of the linear model cited above. For example, this approach suggests that boundary organizations derive their political authority and scientific credibility by responding to the needs and criteria of both the scientific and policy-making communities (in Guston's language, they are agents who respond to the 'bidding' of two principals, science and politics) (Guston 2001, 405). Nevertheless, while the boundary organization concept makes a few good points about the 'external' aspects of the IPCC; the authority it conveys in the scientific and political community, the common norms and coproduced knowledge that come 'out' of the process, much less is said about how these organizations actually work. Forsyth (2003) has little to say about the specifics of how the coproduction processes actually takes place. In fact, the article by Guston (2001) that much of the literature on boundary organizations cites likewise reveals little about their everyday internal workings. Ironically, this leads to a tendency to reify boundary organization and treat their two 'sides' as homogeneous, and indeed separate, actors. In this view, the IPCC is a 'special' forum where the policy-making community comes to talk to the scientific community, as if these two 'communities' actually exist in separate and homogenous domains everywhere else. That is, despite an explicit attempt to address the blurriness of the boundary between the two 'sides' of policy and science, in the end the concept seems to both overemphasize the distinction between science and policy (as if they only meet in these exceptional places like the IPCC), underemphasize the distinctions that exist *within* these two 'sides', and ultimately teach us little about the process through which knowledge is negotiated through the interaction of different groups.

After writing these words, it was reassuring to find Miller (2001) make precisely these two critiques of the concept of boundary organization (though he ultimately retains the concept with modifications) especially if the concept is to be used to describe an international organization like the IPCC. As against focusing solely on the science/policy interface, he cites the need to,

pay greater attention to differences between, say, biology, physics, and agriculture (or, equally, state and federal institutions or legislatures, executive agencies, and courts)... The norms, practices, ideas, and discourses of [these] distinct forms of life may differ considerably from one another, even if they are encompassed within the domain of either science or politics (Miller 2001, 483).

While this can be seen as taking a first step towards opening the black box of the ‘science’ side of ‘science-policy’, at least recognizing that there are different (physical) science disciplines operating, glaringly absent are the social sciences. This point would seem to be all the more pertinent in the case of the IPCC Working Group II, where the domain of science includes the full range of natural and social scientists. Thus, instead of talking about ‘science’ and ‘policy’ as reified separate entities, we should be looking at the actual actors and groups with differing interests, disciplinary perspectives, and normative bases that operate within, for example, the IPCC. In the end, calling the IPCC a ‘boundary organization’ may only encourage us to focus on the ‘boundary’ between science and policy, and forget about other, perhaps more pertinent, boundaries that separate groups (e.g. disciplinary ‘boundaries’) and the processes that bring different groups together (e.g. coalitions and alliances). Miller (2001) suggests such an approach by considering that,

the climate change regime contains a host of equally important but less formalized networks that link people and ideas around the globe. These networks and institutions are essential components of the climate regime, whose actions and interrelations must be understood if we are to make sense of the globalization of environmental governance (Miller 2001, 484).

This kind of an approach has been applied, but only in the case of claims made by natural scientists about the nature of climate change itself as a physical problem. The specific issue of adaptation has not been covered by SSS literature. Doing so would require that the social sciences take a reflexive stance and critically consider their own position in the production of scientific knowledge related to climate change.

Approaching the IPCC through discourse and policy

An approach to the science-policy relationship that is alternative both to the linear model and to the boundary organization concept is what has been called constructivist policy analysis. The essence of this approach is to focus on the ‘upstream’ end of the policy process and consider, not how policy problems are addressed through problem-solving, but how policy problems come to be defined in the first place (Hajer 1997). This approach has been taken up to some extent in the SSS literature. Jasanoff and Wynne (1998), two widely-cited authors in these fields, give a particularly good explanation of this approach and is worth citing at length:

Constructivist policy analysis recognizes not only that issue framings do not flow deterministically from problems fixed by nature, but also that particular framings of environmental problems build upon specific models of agency, causality, and

responsibility. These frames in turn are intellectually constraining in that they delimit the universe of further scientific inquiry, political discourse, and possible policy options. Constructivist policy analysis, therefore, begins with the assumption that questions about how problems are defined and framed must be addressed to have a basis for evaluating the efficacy, merits, or legitimacy of competing social policies. Why do some issues come to be expressed as matters of policy concern in particular ways, at particular times, in particular locations, and through the efforts of particular groups or cultures?... How do issues come to be perceived as natural or technical rather than social, as public rather than private, or as global or universal rather than local? And what roles do science and scientists play in these processes of definition and change?¹² (Jasanoff & Wynne 1998, 5)

While this particular quote uses the term ‘frames’ rather than ‘discourses’, in another work it has been argued that the concepts overlap (Scoville-Simonds 2009). Unfortunately, the work cited above (Jasanoff & Wynne 1998), conceived as a review of the existing science-policy literature, does not apply this approach to the IPCC nor to any other case for that matter.

The hierarchy of science and the forgotten social sciences

It is a general observation that the social sciences have been much less present than the natural sciences in studying diverse aspects of climate change. This may be due to an assumption that the only role the social sciences could play would be as a critique of climate (natural) scientists and of the process of production of climate change knowledge. Many social scientists may be reluctant to take up this role, either because they feel they lack the knowledge necessary to evaluate climate science or for fear that this would mean aligning themselves politically with climate skeptics. Whatever the reasons, the fact remains that social scientists are a relative minority in the study of climate change, impacts, and responses (Grundmann & Stehr 2010; Lever-Tracy 2008; cf. Yearley 2009; Rayner & Malone 1998). Nevertheless, the role of the social sciences is increasing. O’Neill et al. (2010), for example, coded the contributions to a recent climate change congress and found that while the majority of the contributions were from the social sciences, indicating an increasing role of these disciplines, the overall framing and organization of the congress by the organizers and media reflected an ‘epistemological hierarchy’ similar to that at the IPCC’s organization in Working Groups I (physical science basis), II (impacts, vulnerability, adaptation), and III (mitigation) that favors the dominance of the geosciences. Hulme and Mahony (2010, 707-708) review a number of different works that come to the same conclusion: the social sciences are marginalized within the IPCC and in the construction of climate-related knowledge in general.

¹² To these questions could be added: what are the consequences of particular definitions, or, who wins and who loses?

Much of the literature cited here, in making these observations, implicitly or explicitly suggest that the role of the social sciences ought to be increased. For example, Agrawal et al. (2012) argue that the social sciences have been making increasing contributions to studying climate change, but more is needed. Barnes et al. (2013), specifically suggest that anthropology has a number of contributions to make to the study of climate change directly, as well as examining the knowledge claims of 'climate science' (physical science of climate change). These examples highlight two things, 1) the social sciences are playing an increasing yet still marginalized role in the production of climate change-related knowledge, and 2) the common conclusion of these examinations is that 'more is needed.' What this paper proposes, rather, is a more critical examinations of the role that the social sciences are *already* playing in defining adaptation at the international level.

On the other hand, the social sciences, specifically the SSS in the various examples cited in the sections above, have actively examined the role of the natural sciences in producing climate change knowledge. Indeed, the social studies of science often can be seen as social studies of *natural* science. One common theme in this work has been to highlight a 'hierarchy of science' within the natural sciences. As the quote from Miller (2001, 483) pointed out above, there are of course diverse (natural) scientists working on IPCC reports and the relationships between them have been explored to some extent. A particularly strong focus from the SSS literature has been to examine the role of global climate models (GCMs) in climate change research. As authors have pointed out in different ways, the growing and now dominant use of GCMs to understand and predict future climate has contributed to the framing of climate change as a global, environmental (as opposed to social or political) problem requiring (natural) scientific expertise to apprehend it, and similarly-global science-based policy solutions to address it (Demeritt 2001; Miller 2004; Shackley & Wynne 1996). The 'authoritative position of the GCM as the hub around which other scientific and policy making communities must revolve', thereby establishing an, 'implicit research hierarchy' (Demeritt 2001, 316). For example, experimentalists take a secondary role with respect to climate modelers by producing inputs and 'parameterizations' of geophysical processes for the GCMs (Sundberg 2007). In this hierarchy, other natural scientists who are engaged in climate-related research (e.g. glaciologists) must translate their research into forms that are compatible with the needs of GCMs rather than expecting GCMs to adapt to their inputs (Demeritt 2001, 316). Likewise, experimentalists in meteorological research have had to adapt their research interests and activities, or at least represent them in particular ways, to maintain relevance to the GCM community and thereby access research funding (Sundberg

2007). In other words, global climate modeling and the particular way of understanding the climate system it entails, has come to dominate and define what even counts as ‘climate research’ (Sundberg 2007), and set up a hierarchy among natural scientists and their contributions to climate research (Demeritt 2001, 316).

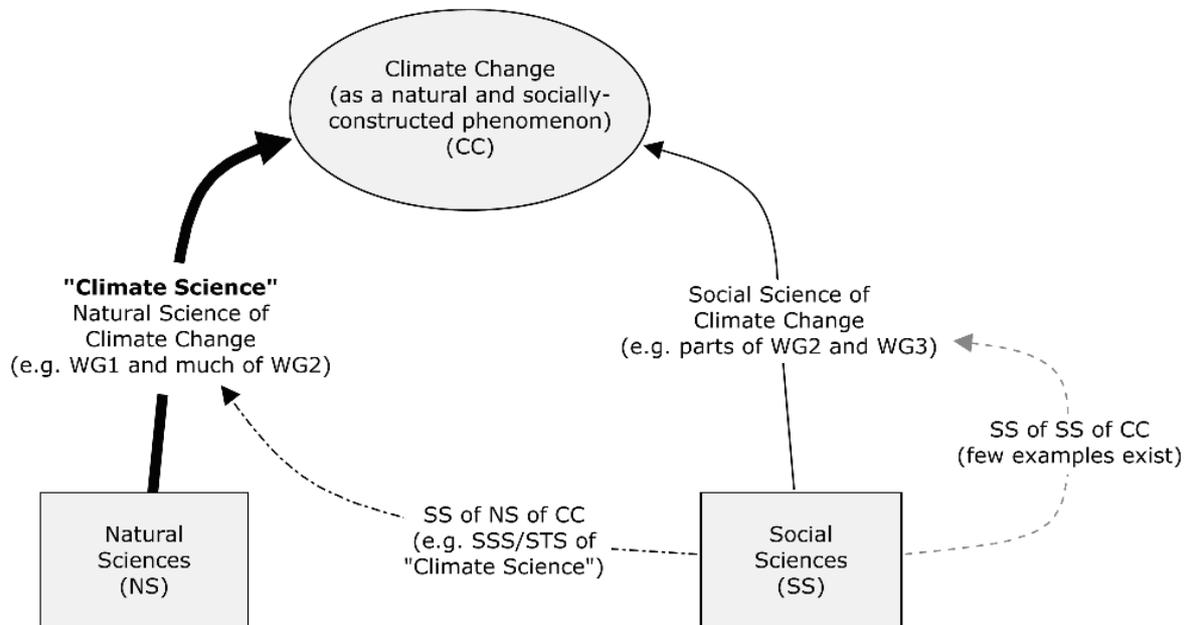


Figure 2 – Author’s illustration of the relationship between the natural sciences studying climate change (“climate science”), the social sciences studying climate change from a different perspective, and the social studies of science studying these two approaches. The weights of the arrows approximately reflect the relative prevalence of each approach (e.g. the natural sciences of climate change clearly dominate, while a reflexive look at the role of the social sciences is nearly absent). The too-clean distinction between natural and social sciences here admittedly oversimplifies and ignores interdisciplinary approaches, such as the more socially-aware environmental science approaches and the contribution of different geographers.

If it has been claimed that the social sciences are marginalized, how exactly do they fit into this hierarchy? What is their particular role? In the end, the vast majority of the SSS literature focuses on the natural sciences’ contribution to climate change-related knowledge. The topic of adaptation, in which the social sciences have perhaps their most important role, has gone almost completely unaddressed by the SSS literature.¹³ In other words, there is as yet no significant body of social science of the social sciences’ contribution to climate change-knowledge. One exception is Yearley (2009) who suggests that a, ‘key part of the way that climate science is currently constructed is the nature of the role assigned to the social sciences and the implicit hierarchy among those sciences’ (401). Yet he ultimately concludes with a call, as here, to break with the ‘majority practice, namely to concentrate on the role of natural

¹³ As an illustration, a search through all abstracts published in two top SSS journals for the terms ‘adaptation’ and ‘climate change’ returned only one result in *Science, Technology & Human Values* and zero results in *Social Studies of Science* (since January 1971 and October 1976, respectively. Search performed October 24, 2013).

scientific knowledge in “environmental policy and politics” (Yearley 2009, 201) and to place the role of the social sciences in climate research under an equally critical light.

As topics involving ‘science of science’ can quickly become confusing, Figure 3.2 attempts to illustrate and summarizes the points made in this subsection. Again, in the climate change field, the natural sciences clearly dominate in the production of scientific knowledge; this is generally what is referred to as “climate science,” and is represented by the work of IPCC Working Group I (physical science basis) and much of Working Group II (impacts, vulnerability, adaptation) in examining the extent of the physical nature of the climate change problem itself and in measuring and predicting the environmental impacts. On the other hand, the social sciences have slowly been integrated into different aspects of the climate change problem, in particular in relation to societal impacts of climate change, vulnerability, adaptation, and mitigation as policy responses, reflected in some of the work of Working Groups II and III. Meanwhile, the SSS literature has largely focused on examining and critiquing the first of these (natural sciences of climate change) while leaving largely unexamined the second (the role of the social sciences in producing climate change-related knowledge). Of particular importance to this paper is that the social sciences contribute to defining what concepts like ‘adaptation’ and ‘vulnerability’ mean, yet there is little reflexivity examining how these concepts come to be defined in particular ways, and the role of the social sciences in the construction of international adaptation discourses. This paper can be seen in part as a contribution to such an effort.

To conclude this section, what has been learned from this review of the how the IPCC and science-policy in general have been conceptualized? A first subsection (2.1) explored the official norms regulating the assessment process and the simplistic way this process is portrayed to the public. Following section (2.2) nuanced and challenged this image to differing degrees and made a number of contributions. First, that the IPCC portrays and attempts to apply a ‘linear model’ for the relationship between science and policy, based on a number of assumptions: that science and policy are separate worlds, that science is value-free, and that scientific consensus is a necessary and sufficient condition for political consensus. Despite the IPCC’s official norm that controversies are to be highlighted, the literature above has suggested that the IPCC in practice presents only consensus views that, rather than highlighting, obscure or omit controversies. Further, the IPCC claims that its policy-relevant messages (especially the Summary for Policymakers) are the ‘pinnacle of the pyramid’ of a process of summarization of scientific facts, whereas this has been questioned by the SSS

literature. In fact, summarization involves a process through which particular views are highlighted while others are obscured.

Further, it was suggested that the IPCC's application of the linear model leads in practice to the politicization of science (or 'proxy debates') whereby both scientists and policymakers couch their value-based positions in the language of science to avoid openly debating the underlying issues and attempt to add the weight of scientific fact to their arguments. Although the linear model is insufficient as a conceptual basis for understanding the relationship between science and policy, it was suggested that its continued application has the advantage of reinforcing the authority of both scientists and policymakers. A final section related to the 'hierarchy of sciences' shows that looking at 'science-policy' as the meeting of two separate and homogeneous worlds is insufficient. The 'science' side in particular is composed of a number of different groups and disciplines. The social sciences, almost unmentioned in most of the literature, play a secondary role. Their position may be assumed to be marginal, though their specific role has largely gone unexamined by the SSS literature, from which we might expect such critical contributions to come.

Yet this review has also demonstrated that existing work on the IPCC's assessment process is limited in a number of respects. The insights summarized above, while important, focus narrowly on the roles and interactions of various disciplines and communities within the *natural* sciences only. The social sciences, if marginalized though not absent from climate change research, are unfortunately also marginalized as an object of study for SSS examinations. It seems to be a forgone conclusion that the social studies of science should focus on the natural sciences' contribution to climate change-related knowledge while often not even mentioning, let alone critically examining, the growing role of the social sciences in the production of this knowledge, especially as it pertains to adaptation. Thus, the SSS literature has brought out important insights about the interactions between different *natural* science communities within climate research and the interaction between these and the policy-making community.

More generally, the shortcomings of the linear model and, to some extent, of the 'boundary organization' concept and the SSS literature in general, highlight the need to go beyond talking about science and policy in abstract ways and instead to address the IPCC with an empirical approach. While a promising 'constructivist policy analysis' approach apparently exists in the SSS field (Jasanoff & Wynne 1998), it appears that this and similar approaches to discourse and policy have not been widely applied to the IPCC. The method for addressing discourse and policy in Chapter 2 as well as the review above suggests a number of questions

to guide such an empirical approach: How does the assessment process actually work in practice? How are specific views – discourses, values, norms; and not just ‘facts’ – such as particular definitions of the adaptation problem, organized into the assessment-writing process, and others organized out? (And, what are the diverse specific views in the first place?) Especially, how do particular definitions get organized into the SPM and sanctified as IPCC official messages? What role are the social sciences currently playing in this process?

The following section will attempt to address specifically these questions through an empirical discourse analysis. The section will identify the multiple discourses present in the IPCC AR4 and AR5 WGII reports and the extent to which a particular discourse is emphasized and another marginalized. A later version of this paper will include an in-depth empirical analysis of the IPCC assessment process as a site of discursive negotiation, taking the final report and the available preliminary drafts and reviewer comments as primary source documents to examine the informal ‘de facto’ norms that are actually applied in the assessment process. This analysis both challenges and confirms some of the previous conceptualizations of the IPCC cited above, and presents a picture of the IPCC process that differs significantly from the official IPCC norms.

3 Summary and comparison of four discourses identified in the IPCC AR4 and AR5 WGII reports

Four shifting, competing and sometimes overlapping discourses were identified in the AR4 and AR5 WGII reports. A discourse was considered distinct from others based on 1) how it constructs a particular definition of the climate change adaptation problem 2) the epistemic assumptions that give particular value to certain kinds of knowledge over others and 3) the way it positions particular actors with respect to this problem (following a methodology developed in Scoville-Simonds 2009). The identification and full description of these discourses was presented in a previous work (Scoville-Simonds 2014), the results of which can be summarized in the following comparative table (Table 1). The four discourses vary greatly yet overlap occasionally in terms of how the problem is defined, the solutions they propose, the positionings they set up for different actors, and the types of knowledge that are valued.

	Technical	Managerial	Contextual	Critical
Underlying problem	Climate change	Climate change	Climate change in context	Political marginalization
Specific problems	Immediate biophysical impacts of climate change (e.g. temperature, sea-level rise, crop damage, etc.)	Impacts of climate change to specific sectors, lack of planning capacity, uncertainty in impact projections	Multiple stressors, vulnerability to climate change (~poverty), access to resources	Exclusion of most vulnerable from decision-making
Specific solutions	Dams, seawalls, forecasting and alert systems, new crop varieties, adjustment in infrastructure design parameters, etc.	Improved impact projections, integrate projected impact information into sectoral planning	Reduce vulnerability (~poverty), build adaptive capacity, policies to ensure equitable access to resources	(None?)
Overall solution	Apply existing and develop new technology and techniques	Apply existing planning and policy-making techniques in light of impacts	'Mainstream' adaptation into development	Functioning democratic structures, transforming power relations
Types of knowledge valued	Fact-based 'information' collected by experts and the technical expertise they provide	Technical expertise as the primary input to planning process	Fact-based expertise from the experience of development agencies and social scientists	Value-based choices of those who must adapt
Positionings	Experts: natural scientists, engineers Knowledge users: decision-makers Vulnerable: infrastructure, systems	Experts: Policy-maker as judicious decision-maker, informed by analyst as expert Vulnerable: sectors	Experts: Development actors, social scientists Vulnerable: poor countries and groups	Vulnerable: politically marginalized groups excluded from decision-making

Table 1 – Discourses identified in the AR4 and AR5 WGII reports, distinguished and described according to different characteristics of discourse.

The different discourses may seem like simply varying points of view, different perspectives on a complex problem, with a variety of different proposed solutions. Yet, here it is suggested that these diverse points of view can be characterized in a more fundamental way by asking a pair of related questions for each discourse. If adaptation is essentially change, what must change, and what is either implicitly or explicitly assumed not to change from the perspective of each discourse? Taking this perspective and, admittedly, taking a flexible interpretation of each discourse, Table 2 can be constructed.

In words, the technical discourse assumes that the necessary and sufficient changes for adaptation to take place are technical in nature, responding directly to climate change impacts. At most, infrastructure and people must be relocated out of harms way. The managerial discourse focuses on change at the planning level to effectively implement similar responses

to impacts. Effective adaptation would mean developing plans and policies that take into account future impacts and uncertainty surrounding this knowledge. The contextual discourse identifies poverty, or more generally the distribution of resources as the underlying root cause of vulnerability, and thus proposes that changing this (through development) is what successful adaptation must mean. If vulnerable people had the resources necessary to adapt, the other more specific changes would also follow (plans and infrastructure, etc.). The critical discourse focuses on the distribution of decision-making authority – what must change for successful adaptation to take place are the fundamental power relations that constrain and enable the choices available to people. It is assumed that the more specific adjustments (distribution of resources, planning, and technical changes) depend on the value-based choices of those who must adapt and would follow automatically if decisions were made in an inclusive democratic manner. Each of the discourses then specifically identifies a particular ‘locus’ of the changes necessary for adaptation to take place. Each reflects what ‘adaptation’ means – who and what must change.

	Technical	Managerial	Contextual	Critical
technology, settlement patterns, infrastructure	Δ	Δ	Δ	Δ
plans, policies, and ways of managing	=	Δ	Δ	Δ
distribution of resources (objective capacities)	=	=	Δ	Δ
distribution of decision-making authority (power relations)	=	=	=	Δ

Table 2 – Varying depth of change required for successful adaptation, indicated as either (Δ) required change or (=) status quo (often implicit).

Perhaps the more interesting argument is that when changes are not explicitly required, it is an implicit assumption that the status quo is sufficient or desirable. That is, reading Table 2 from bottom to top, technical changes can be made through existing decision-making structures, without fundamentally changing the distribution of resources or requiring significant policy-maker decisions on planning. Managerial solutions may likewise be implemented through typical bureaucratic means, without challenging power relations or the rules governing access to resources. It is assumed that contextual solutions can be achieved by

changing access to resources (e.g. reducing poverty, enhancing adaptive capacity), without fundamentally challenging the rules that govern who makes the resource-access rules. The critical discourse requires change on the most transformative level – it is precisely the status quo of power relations that much be challenged. With this interpretation, it can be seen that all four discourses contain implicit or explicit normative content. They either challenge or leave unquestioned the status quo on the diverse levels illustrated. Each of them is thus ‘political’ in the sense that the problems they define and solutions they propose have effects of reiterating or challenging relations of power, though it is only the critical discourse that addresses this explicitly.

On a general level, this analysis demonstrates that the IPCC is by no means a homogeneous ‘actor’ with a particular and well-defined ‘position’ in the debate on climate change adaptation. On the contrary, it highlights the multivocal nature of the IPCC which encompasses divergent views, each defining the problem of adaptation in varying ways, valuing varying types of knowledge, and assigning different roles to actors presumed to be involved in thinking and doing adaptation. The range of different perspectives, at least between the technical, managerial, and contextual discourses, from the more impacts-driven end of the spectrum requiring a direct response to impacts to the more socially-aware end of the spectrum also reflects in some ways the conceptual history of adaptation. That is, while initially it was considered that impacts would require specific ‘adaptation policies’, there has been a shift towards focusing on development policy to address underlying vulnerability (poverty) as well as an increasing emphasis on adaptation as a developing country issue and therefore an increase in the role of development actors in defining what adaptation means (Schipper 2006).

Each of these different discourses can, on a more general level, be seen as reflecting and reproducing particular worldviews. For the technical discourse for which the problem of climate change is a technical one of responding directly to specific impacts, the world is made up of a collection of systems – ecosystems, infrastructure, etc. The term ‘vulnerable,’ if used at all (more often, ‘exposed’, or ‘at risk’), refers to these systems. Climate change is a problem because particular systems and infrastructures are at risk (which in turn, certainly, affect people). For the managerial discourse, emphasizing the need for appropriate planning faced with uncertain impacts, the world is an economy, composed of economic sectors – climate change is a problem because some economic sectors are particularly vulnerable. From the perspective of the contextual discourse, the world is made up of individuals and social groups – climate change poses a problem for vulnerable populations (often identified as poor,

'local' populations), for the people who act as their advocates (social scientists) and for those who see it as their job to them adapt (development actors). The critical discourse understands the world as a network of power relations. Individuals and social groups are seen as vulnerable, but not only to climate change. If climate change poses a problem, it is that the pre-existing structures of inequality risk being exacerbated not only by climate change impacts, but also by the policies put in place to address those impacts.

The world is made of systems and infrastructure, economies and sectors, social groups, or power structures. These different perspectives highlight the varying disciplinary starting points reflected by each discourse. The technical discourse relies on the expertise of natural scientists and of engineers – the experts who are able to predict the specific nature, location, and degree of impacts, redesign existing infrastructure and systems, and develop new techniques and technologies to face those impacts directly. The managerial discourse also values this kind of expertise, but takes a wider view by considering the impacts to entire sectors and asks questions about the costs and benefits of impacts and their responses that require the expertise of the economic sciences in particular. The social sciences find the greatest space for their contributions, and thus their most authoritative role, in the contextual discourse highlighting themes on which their expertise is valued – poverty, inequality, health, education, etc. The critical discourse likewise relies on insights from the social sciences, but takes a more critical stance, focusing not only on the social aspects of adaptation, but on its inherently political aspects.

Given that it is only the critical discourse that puts particular emphasis on the importance of adaptation as a value-based choice, thereby requiring that those who must adapt be involved in the decision-making, while the other three focus on the importance of expertise, these first three discourses can be seen as technocratic, in the sense that it is assumed that adaptation solutions can and should be devised and implemented by 'experts' of different shades. If the technical, managerial, and contextual discourses are technocratic, it is only which particular type of expertise, or *techne*, and correspondingly which expert, or technician, that is variably assigned the decision-making authority. Again, the technical discourse values the expertise of the natural scientist and engineer; the managerial discourse, the economist and planner ('economic engineer'); the contextual discourse, the social scientist and developer ('social engineer'). The critical discourse on the other hand, admittedly short on recommending practical adaptation measures, does not prescribe the specific solution, but asks a question – who should be the 'engineers' of adaptation and of society?

4 Description of the Contextual and Critical discourses and their shifts within the full reports

As this paper seeks to address the role of the social sciences in the adaptation debate, the two more socially-aware discourses which reflect the influences of the social sciences, the socio-contextual and critical discourses, will be addressed here in greater detail. A second objective of this work is to demonstrate the shifting nature of these discourses between the AR4 and AR5. On a general level, it can be said that the AR5 clearly provides greater space for the discussion of adaptation and likewise, greater participation from social scientists than the AR4 (e.g. AR4 included only two chapters clearly dedicated specifically to adaptation, whereas AR5 includes some seven). But what qualitative shifts does this quantitative shift entail? Specific shifts in the commitments of the socio-contextual and critical discourses will be addressed, as well as the overall prevalence of each discourse within the report. The socio-contextual discourse as it appears in the AR4 will be treated first (Section 4.1), followed by a discussion of how it has evolved in the AR5 (Section 4.2). The critical discourse in AR4 (Section 4.3) and its evolution as seen in AR5 (Section 4.4) will then be discussed. In this, it will become clear that while some shifts have occurred, the socio-contextual discourse continues to enjoy relative dominance as compared to the critical discourse, which can only really be identified in fragments scattered throughout the reports.

4.1 The socio-contextual discourse as it appears in the AR4

The main distinguishing feature of the socio-contextual discourse is that it puts particular emphasis on the social, contextual, often 'local' factors that influence vulnerability to climate change, while dissociating the adaptation problem from impacts and projections (and thereby, the expertise associated with impacts projections). Coming back to the definition of vulnerability, whereby vulnerability is expressed as a function of exposure, sensitivity, and adaptive capacity is pertinent here. The technical and managerial discourses on the exposure and sensitivity elements of vulnerability, which are most directly related to the impacts themselves rather than to society. The contextual discourse, while still focusing on impacts from climate change (it is still vulnerability *to* climate change), puts more emphasis on the adaptive capacity component of vulnerability and on the social contextual factors that influence this adaptive capacity.

Adaptive capacity

In one chapter a particular subsection titled 'key adaptation issues' highlights the way the contextual discourse relates to but goes beyond the technical and managerial solutions, and focuses on adaptive capacity:

The central issues for adaptation to climate change by industry, settlements and society are (a) impact types and magnitudes and their associated adaptation requirements, (b) potential contributions by adaptation strategies to reducing stresses and impacts, (c) costs of adaptation strategies relative to benefits, and (d) limits of adaptation in reducing stresses and impacts under realistically conceivable sets of policy and investment conditions... Underlying all of these issues, of course, is the larger issue of the adaptive *capacity* of a population, a community, or an organisation: the degree to which it can (or is likely to) act, through individual agency or collective policies, to reduce stresses and increase coping capacities (Chapter 17). In many cases, this capacity differs significantly between developing and developed countries, and it may differ considerably among locations, economic sectors and populations even within the same region. (AR4_Ch7 383, emphasis in original)

The reference to Chapter 17 is appropriate. There, adaptive capacity is defined as, ‘the ability or potential of a system to respond successfully to climate variability and change, and includes adjustments in both behaviour and in resources and technologies’ (AR4_Ch17 727). The phrase ‘climate variability and change’ is more inclusive than just ‘climate change impacts.’ At the same time as refocusing attention on adaptive capacity, the contextual discourse takes attention away from the importance of impacts themselves. Thus, adaptation, understood as ‘enhancing adaptive capacity,’ becomes an independent activity disassociated from specific impacts.

If for the contextual discourse the problem is defined as vulnerability, specifically focusing on low adaptive capacity, the solution – successful adaptation – means planned adaptation measures designed to enhance adaptive capacity. Technical solutions such as changing agricultural inputs, irrigation timing and methods, crop varieties, erosion control, improved pest, disease and weed management, and genetically modifying crops to increase resistance under new climate regimes (AR4_Ch5 294-296), are by no means excluded as parts of the solution, yet their expected effectiveness may be limited and must be evaluated taking into account the specificities of different contexts (AR4_Ch5 295). Planned adaptation does not come in the form of a pre-packaged technical solution targeting a specific impact (technical discourse) or even in a portfolio of solutions to be applied by flexible ongoing planning faced with diverse impacts (managerial discourse), but rather means providing a more ‘robust’ solution through enhancing adaptive capacity of those who must adapt.

Dissociation from impacts

Although the contextual discourse does not exclude technical solutions, an important aspect of the discourse is the way that it dissociates adaptation activities from impacts, and thereby, from climate projections and the experts who perform them. In this understanding,

the meaning of ‘adaptation’ is expanded in the sense that what people adapt to is a wider category than just current and future climate change impacts. For example, central and unique to this discourse is pointing out the importance of ‘other stresses’ besides climate change: ‘In practice, adaptations tend to be on-going processes, reflecting many factors or stresses, rather than discrete measures to address climate change specifically’ (AR4_Ch17 720). Likewise, the contextual discourse often brings up the importance of a society’s history of adaptation (and maladaptation) to climate, climate variability, and extremes:

There are well-established observations of human adaptation to climate change over the course of human history... Despite evidence of success stories, many individuals and societies still remain vulnerable to present-day climatic risks, which may be exacerbated by future climate change. Some adaptation measures are undertaken by individuals, while other types of adaptation are planned and implemented by governments on behalf of societies, sometimes in anticipation of change but mostly in response to experienced climatic events, especially extremes (AR4_Ch17 720)

And likewise,

Adaptation measures are seldom undertaken in response to climate change alone (very high confidence). Many actions that facilitate adaptation to climate change are undertaken to deal with current extreme events such as heatwaves and cyclones. Often, planned adaptation initiatives are also not undertaken as stand-alone measure, but embedded within broader sectoral initiatives such as water resource planning, coastal defence, and disaster management planning. (AR4_Ch17 719)

Thus, if the definition of the problem for the technical and managerial discourses rests essentially on the climate change impacts themselves, for the contextual discourse, the problem is defined as climate change within a context of existing stresses and taking into account a history of adaptation and vulnerability to climatic variability and extremes. The contextual discourse thus proposes a broader definition of the problem, and likewise considers that adaptation ought to include a broader set of solutions, including addressing these ‘other stresses’ and pre-existing vulnerability to climate. This explains the focus on enhancing ‘adaptive capacity’ rather than proposing direct solutions for specific impacts.

Multiple stresses

Thus, one aspect of the contextual discourse, and as a departure from both the technical and managerial discourses, is pointing out that societies (and ecosystems) face ‘multiple stressors’ in addition to climate change. These multiple stresses increase vulnerability, or equivalently, reduce adaptive capacity. The vulnerability of small-holder agriculture, for example, is affected by environmental degradation, increasing food quality and safety regulations, withdrawal of government market-stabilization interventions,

developed countries' protectionist agricultural policies, and declines and variability in world market prices for agricultural commodities of developing countries (AR4_Ch5 279). Likewise, rapid urbanization and a shift away from agriculture as a primary livelihood,

are among the key factors likely to *shape the social setting* in which climate change is likely to evolve. These factors will *determine how climate change affects agriculture*, how rural populations can cope with changing climate conditions, and how these will affect food security. Any assessment of climate change impacts on agro-ecological conditions of agriculture must be undertaken against this *background* of changing *socio-economic setting* (AR4_Ch5 280, emphases added).

Likewise, in the case of impacts of climate change on human health, it is noted that 'social conditions' modify the ways that climate change is translated into concrete health impacts (AR4_Ch8 396). Clearly, the contextual discourse in defocusing attention on impacts and refocusing on social aspects of adaptation reflects an increasing influence of the social sciences in adaptation literature. This point will be treated more in depth further on.

What exactly are these 'other stresses' that the contextual discourse suggests increase vulnerability or decrease adaptive capacity? A specific formula is not described, but a number of examples are riddled throughout the text:

The capacity to adapt is dynamic and influenced by economic and natural resources, social networks, entitlements, institutions and governance, human resources, and technology... Multiple stresses related to HIV/AIDS, land degradation, trends in economic globalization, and violent conflict affect exposure to climate risks and the capacity to adapt. (AR4_Ch17 719)

While a consensus on the precise factors that make up adaptive capacity is not given, it is suggested that 'there has been a convergence of findings in the literature showing that human and social capital are key determinants of adaptive capacity at all scales, and that they are as important as levels of income and technological capacity' (AR4_Ch17 728). It is one of the main conclusions of the final chapter of the report that:

Vulnerability to specific impacts of climate change will be most severe when and where they are felt together with stresses from other sources... Non-climatic stresses can include poverty, unequal access to resources, food security, environmental degradation and risks from natural hazards (AR4_Ch20 813).

Other examples of the factors to consider include: levels of national development, political stability, economic well-being, human and social capital and institutions, per capita income, inequality in the distribution of income, health care coverage, access to information (AR4_Ch17 728). Elsewhere, the 'list of critical determinants of adaptive capacity... includes

access to economic and natural resources, entitlements (property rights), social networks, institutions and governance, human resources and technology' (AR4_Ch20 814-5)

Poverty, development

Within this litany¹⁴ of 'other stresses', is there not one root cause that can be singled out? Already mentioned explicitly and implicitly suggested several times, above all a central tenant of the contextual discourse is that, '[p]overty is the most serious obstacle to effective adaptation' (AR4_Ch8 417). Likewise elsewhere,

progress towards health, education, training and access to safe water and sanitation, and other indicators of social and environmental progress including adaptive capacity remains a significant challenge. It can be addressed through appropriate policies and commitment to ending poverty (AR4_Ch20 832).¹⁵

The myriad other stresses cited above are generally treated as symptoms of the underlying problem of poverty. The contextual discourse, in associating with vulnerability many of the same problems already associated with poverty, essentially equates the two.¹⁶

The above few paragraphs have described some of the factors that determine vulnerability and adaptive capacity and suggested that in various places throughout the report the connection is made that these factors are also associated with poverty, and thus the equation between vulnerability and poverty is made. When the adaptation problem is defined this way, the solution is easy to see. If vulnerability is poverty, adaptation means development. According to the contextual discourse, if vulnerability to climate change is defined as a problem of poverty and associated issues, the solution (successful adaptation) means enhancing adaptive capacity or reducing vulnerability, through development. The association between adaptation and development is clear in the IPCC AR4 WGII report, even if it is not always explicitly stated. The adaptation-development equation is made most often indirectly through associating vulnerability with all of the same problems as are associated with poverty as cited above (access to resources, land degradation, conflict, diseases, political instability, etc.).

¹⁴ Indeed, Chapter 20 includes a subsection explicitly titled 'A catalogue of multiple stresses' (AR4_Ch20 816). See the discussion below.

¹⁵ Again, elsewhere, the main determinants of adaptive capacity are identified as poverty and access to resources (AR4_Ch7 383).

¹⁶ It should be noted that the report explicitly states, at least in one place, that, '[r]esearchers and practitioners should not equate vulnerability to poverty, though, and they should not consider adaptation and adaptive capacity in isolation' (AR4_Ch20 818). That there is one instance of this statement amid myriad other explicit and implicit remarks throughout the report that suggest the extremely close relationship between vulnerability and poverty can be seen as the exception that proves the rule.

The most explicit examples of the adaptation-as-development link can be found in Chapter 20, ‘Perspectives on climate change and sustainability.’ As the last chapter of the report it is positioned as a sort of conclusion¹⁷ and makes explicit the adaptation-development association. In one place, the association is demonstrated by connecting the ‘determinants’ of adaptive capacity and of sustainable development (similar to the way in which the determinants of vulnerability and poverty are associated, as discussed above):

A brief excursion into some of the recent literature on economic development is sufficient to support the fundamental observation that the factors that determine a country’s ability to promote (sustainable) development coincide with the factors that influence adaptive capacity (AR4_Ch20 816).

The demonstration proceeds through a review of economic development literature, highlighting along the way the factors contributing to sustainable development that are also identified as factors contributing to adaptive capacity. The argument there is that the determinants of sustainable development and adaptive capacity are identical, specifically- ‘*access to resources, entitlements (property rights), institutions and governance, human resources (human capital in the economics literature) and technology*’ (AR4_Ch20 816, italics in original). The particular list of determinants of adaptive capacity is taken directly from Chapter 17, which largely expresses the same view of adaptation-as-development, though less explicitly. In other words, the adaptation problem had already implicitly been defined as one of poverty in Chapter 17, so it is no surprise that Chapter 20 finds that enhancing adaptive capacity bares a striking resemblance to sustainable development. Likewise, Chapter 20 reviews and recommends a number of traditional development methodologies (Rapid Rural Appraisal, Participatory Integrated Assessment, etc.) for implementing adaptation (AR4_Ch20 832-834). The problem and the solution fit together seamlessly.

At times, the adaptation-development equation is not stated directly. Instead, it is expressed as a forgone conclusion as if it were already a widely-accepted fact. For example, in lamenting how current indicators of sustainable development do not take into account adaptation it is stated that, ‘[t]here is, for example, no mention within the [Millennium Development Goals] of potential changes in climate-related disasters or of the *need to include*

¹⁷ The IPCC AR4 WGII report has no official ‘conclusion’ chapter. Yet Chapter 20 is implicitly positioned as a set of conclusions by the way that it brings together statements from throughout the report through the much greater use, as compared to other chapters, of internal references to previous chapters of the report to support the chapter’s main points. It also explicitly sets itself apart from the rest of the report by stating: ‘the first 19 chapters of this volume assess the regional and global impacts of climate change and the opportunities and challenges for adaptation. Chapter 17 and 19 in this volume offer synthetic overviews of this work that focus specifically on adaptation and key vulnerabilities. Chapter 20 in this volume expands the discussion to explore linkages with sustainable development’ (AR4_Ch20 814).

climate-change adaptation within development programmes' (AR4_Ch20 819, emphasis added). That such a 'need' exists is presumed. Elsewhere,

Future links between sustainable development and climate change *will evolve from current development frameworks*; but recognizing the exposure of places and peoples to multiple stresses... and accepting the *challenge of mainstreaming adaptation into development planning* will be critical in understanding what policies will work where and when (AR4_Ch20 818, emphases added).

Throughout, the keyword that allows different actors to gloss over this association, that at once argues the case for adaptation-as-development while avoiding stating this directly, is the word 'mainstreaming.' Here, mainstreaming is presented as a 'challenge.' That such a challenge exists and that we should be focusing on it is presumed. In other words, the report presumes the essential equivalence of adaptation and development and proceeds directly to debating the 'tough' questions – how can we meet this challenge, what are the barriers, obstacles, determinants and best ways to proceed? The problem is defined as how to mainstream adaptation into development planning, and the report focuses so much on how to meet this 'need' or 'challenge,' that the reader almost forgets to ask how and why the problem has been defined this way in the first place, and whether it is really such a widely-held belief that this is how it ought to be defined. While this definition of the problem is presented by the contextual discourse as a forgone conclusion, the following chapters of the thesis will demonstrate that this is far from the case.

This presumption is also evident in the way Chapter 20 is structured. For example, the section titled 'Opportunities, co-benefits and challenges for adaptation', includes subsections such as 'Challenges and opportunities for mainstreaming adaptation into national, regional and local development processes' (AR4_Ch20 832) and 'Bringing climate-change adaptation and development communities together to promote sustainable development' (AR4_Ch20 834-6). Again, it is evident that the question being asked about adaptation-as-development is always, 'how can it be done' rather than, say, 'should this be done.' This is explicitly recognized in one place: '[a]lthough linkages between climate-change adaptation and sustainable development should appear to be self evident, it has been difficult to act on them in practice' (AR4_Ch20 835). The way that mainstreaming is presented as a forgone conclusion and quickly skipping ahead to the questions of implementation are indicators that adaptation-as-development is already, or is presumed to be, a widely-held norm. The self-evident, what goes without explanation, is what is assumed to be true.

Several of the figures in Chapter 20 illustrate this conception of adaptation. First, the basic premise of the chapter is that adaptation (rather, ‘enhancing adaptive capacity’) can be seen as an integral part of sustainable development. In one diagram, it is depicted as a fourth ‘leg’ integrated in among the other legs of the ‘three-legged stool’ of sustainable development (referring to the ‘three pillars’ – social, economic, environmental – of the mainstream conception of sustainable development) (AR4_Ch20 815). Likewise it is asserted, that ‘a strong political will and public commitment to promoting sustainable development is needed, focusing simultaneously on economic growth, social progress, environmental conservation and adaptation to climate change’ (AR4_Ch20 835). Elsewhere a series of global maps illustrate for the reader the policy choices facing the planet are presented to us in simplified form (one of two series is reproduced in Figure 4.1). The maps depict the effect of combinations of two policy choices – 1) mitigating emissions with a target of restricting carbon dioxide levels to 550ppm and 2) enhancing adaptive capacity worldwide so that developing countries’ adaptive capacity reach the current global mean by 2050 or 2100 (the latter date in the case shown).

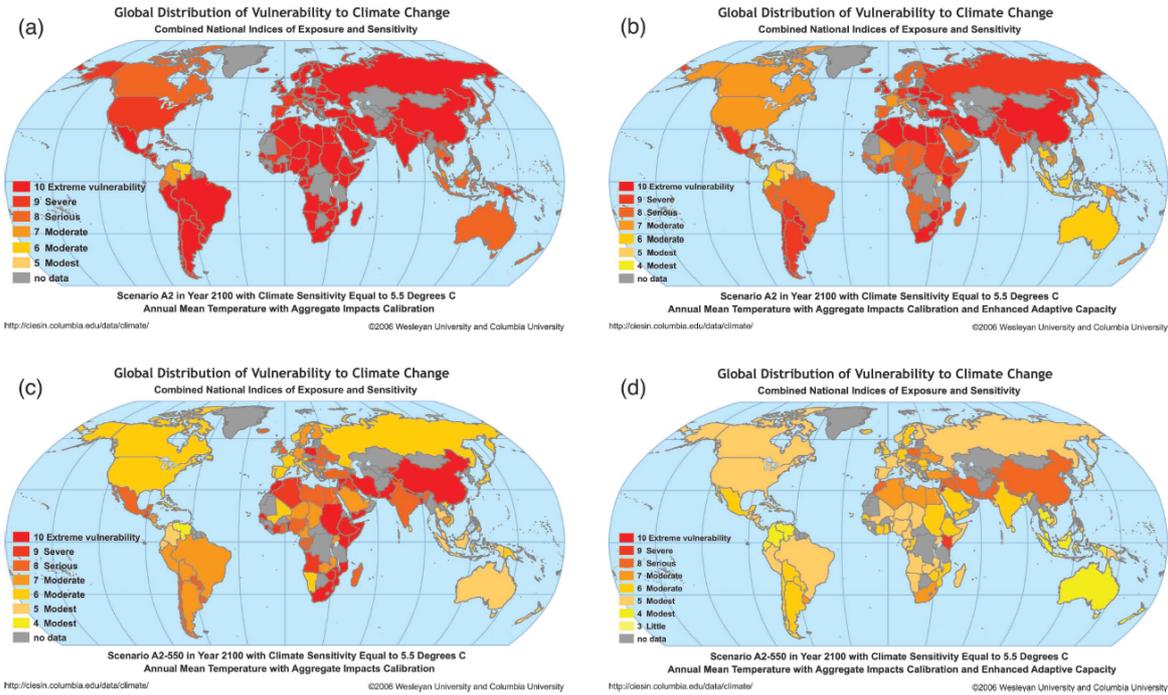


Figure 3 – Global distribution of vulnerability in 2100, expressed as a function of a combination of the two policy choices – mitigation and enhancing adaptive capacity. (a) no policy action (b) enhanced adaptive capacity only, (c) mitigation only, and (d) mitigation and enhanced adaptive capacity combined. (figure from AR4_Ch20 831)

The point that the authors attempt to make through this illustration is that both mitigation and enhancing adaptive capacity are necessary to address global vulnerability; that neither alone is sufficient (and even pursuing both may not eliminate all vulnerability)

(AR4_Ch20 827-832). Yet these maps also reveal a number of assumptions of the contextual discourse:

-Instead of mitigation and adaptation, the typical two solutions discussed under the UNFCCC, the policy options are mitigation and ‘enhancing adaptive capacity.’ Adaptation is synonymous with, indeed replaced by, enhancing adaptive capacity. The use of adaptive capacity in place of adaptation is frequent throughout Chapters 17 and 20.

-Vulnerability is a characteristic (indeed, quantity) that can be unproblematically measured and aggregated to the national level. That is, there are not only vulnerable people and groups, but also vulnerable countries. Further, the latter is considered to sufficiently represent the former.

-Adaptive capacity is likewise a characteristic that can and should be enhanced world wide. (Likewise elsewhere, ‘a high priority should be given to increasing the capacity of countries, regions, communities and social groups to adapt to climate change in ways that are synergistic with wider societal goals of sustainable development’ (AR4_Ch17 737))

-Adaptive capacity in developing countries can be brought up to current world average levels through some appropriate program of ‘enhancement.’ That is, somehow, developing countries can be helped to ‘catch up.’

The parallels to the underlying logics of development discourse are evident. Poverty/vulnerability can be measured and quantified. Not only can people and communities be labeled poor/vulnerable, but, through aggregation of these quantities, entire countries can be identified as poor/vulnerable. Poverty/vulnerability can be reduced through a program of development/adaptation whereby developing/vulnerable countries can ‘catch up’ with the rest of the world. As with the technical and managerial discourses, the contextual discourse contains not only an urgency that ‘something must be done’, but also a certain optimism that something can be done, and that it can be done through existing methods and logics. Development is assumed to already address many of the same ‘determinants’ of vulnerability and adaptive capacity. Adaptation, then, can be addressed through integrating (‘mainstreaming’) adaptation activities into traditional development activities. There is no need to reinvent the wheel.

Apart from defining the adaptation problem and solutions in particular ways, it can be seen from the discussion above that the contextual discourse sets up a number of identity positions for different actors. First and foremost, there are the ‘vulnerable’ – the ‘target’ group of adaptation. As already mentioned, in the contextual discourse vulnerable is largely equated with poor, and can be applied to social organization at any scale, in particular, at the national

scale. Thus the category ‘vulnerable country’ is constructed, which is largely equivalent to ‘developing country.’ The vulnerable (people, countries) are portrayed as both the victims and heroes of the climate change adaptation problem. Victims, as they are the ones who must adapt to a problem largely created by the ‘developed’ countries, who are then the villains of the story. Yet the contextual discourse, especially as it is enunciated by the IPCC with its requirement of remaining ‘policy-relevant’ but not ‘policy prescriptive’ generally avoids the ‘too-political’ characterization of the adaptation problem as one with victims and villains, or of adaptation-as-restitution. Instead, under the adaptation-as-development norm, both the developing and developed countries are portrayed in a positive light. Thus, both are potential ‘heroes’ of adaptation: developing countries who face the challenge of adaptation by taking climate change seriously in national plans and policies, and developed countries, by charitably initiating the funding transfers assumed necessary.

Most frequently in the contextual discourse the terms ‘vulnerable’ and ‘adaptive capacity’ are applied to countries. The discourse is thus highly compatible with the UNFCCC international (inter-state) negotiation process in that it the main players are present – developing and developed states, and reflects an essentially statist view. The assumption is that the solution to the adaptation problem is, essentially, financial flows from developed to developing countries. Likewise, it is a forgone conclusion that terms like vulnerable and adaptive capacity are applicable at the national level and that applying them in this way gives an adequate picture of the worldwide state of affairs. If the question of how we move from thinking about vulnerable people to vulnerable countries is addressed at all, it is treated as a technical question of ‘aggregation’ – a calculation that combines multiple quantities at lower scales into a single quantity assumed to represent the whole. Focusing on aggregation obscures of course the more fundamental question of representation. Can it really be assumed that vulnerable countries (or state negotiators at the UNFCCC) represent the needs and interests of the most vulnerable? If national ‘adaptive capacity’ is somehow ‘enhanced’ through some program or funding transfer, does this automatically mean that vulnerable groups within ‘vulnerable’ countries are better off? These questions go not only unanswered but simply unasked in the IPCC report.

In any case, adaptation-as-development is a convenient shortcut that the contextual discourse, by associating vulnerability with poverty, vulnerable countries with developing countries, permits. By applying the new schema of categorization in terms of vulnerability onto the historical schema of developing/developed, vulnerability is naturalized as a legitimate category and as a pertinent one for use in the design of policy intervention. It is a

convenient metaphor that permits actors to think and to act in familiar ways within a new-world-made-familiar in a way that abstract definitions of vulnerability and adaptation created ex nihilo have failed to do.

Authoritative position for development agencies

A consequence of this particular categorization of the world offered by the contextual discourse is the authoritative position that it ascribes to the traditional actors of development. One direct illustration of this tendency is the way that literature published by development agencies is employed by IPCC authors. Two simple demonstrations suffice to demonstrate this. One particular report, 'Poverty and Climate Change: Reducing the Vulnerability of the Poor through Adaptation', (AfDB et al. 2003) prepared by a group of ten development agencies is cited eleven times in the IPCC AR4 WGII. This text is fundamental as it represents the consensus view on adaptation by development agencies. The main message of this report is identical to the core commitment of the contextual discourse, that, 'the best way to address climate change impacts on the poor is by integrating adaptation responses into development planning' (AfDB et al. 2003, v). Apart from a few instances in which the report is cited on purely economic matters, the report is widely employed by different IPCC author teams as an authoritative source on themes that directly contribute to the definition of the climate change adaptation problem and its solutions. It is cited regarding impacts of climate change (AR4_Ch9 458; AR4_Ch16 709), specific adaptation strategies (AR4_Ch7 383; AR4_Ch9 453), development as a determinant of adaptive capacity (AR4_Ch17 728), and above all, the 'need' to mainstreaming adaptation into development (AR4_Ch16 709; AR4_Ch18 767; AR4_Ch2 835; AR4_Ch20 835). Similarly, World Bank publications¹⁸ are cited throughout the report regarding impacts of climate change (AR4_Ch10 483; AR4_Ch16 697; AR4_Ch16 697; AR4_Ch16 698; AR4_Ch17 701), methods for vulnerability assessment (AR4_Ch2 138), environmental problems as 'other stresses' (AR4_Ch13 597), ecosystem and resource management as specific adaptation strategies (AR4_Ch13 592; AR4_Ch10 491; AR4_Ch5 279; AR4_Ch10 491; AR4_Ch13 602), costs of adaptation (AR4_Ch17 727; AR4_Ch17 734), financing Adaptation (AR4_Ch18 753; AR4_Ch18 769), and, again, mainstreaming adaptation into development (AR4_Ch20 835).

¹⁸ The data analysis for this illustration was the same as described in the previous footnote, but based on references to any works authored by the World Bank. That is, all citations of the form '(World Bank, <date>)' were included. No effort was made to track down the many other publications from the World Bank listed in the references sections of each chapter but cited according to their respective authors.

If we take the understanding of discourse as the system of rules determining possible statements (Foucault [find ref again]), it can be seen that at least within the contextual discourse directly citing development agencies as authoritative sources on what the impacts of climate change will be and how they will affect people, how vulnerability should be defined and assessed, what adaptations strategies are appropriate, and how adaptation ‘should’ be integrated into development planning, are ‘possible’ statements permitted by the underlying assumptions of the discourse. In other words, it was considered acceptable by at least 10 of the 20 IPCC AR4 WGII chapter teams to cite the primary development actors as authoritative sources on what adaptation is or ought to mean. In this not-so-subtle yet largely unquestioned way, the traditional actors of development are repositioned as authoritative voices in debates defining how adaptation is to be conceived and carried out. The contextual discourse more than the others largely embraces and lends credence to this new authoritative role of development actors through its definition as vulnerability as poverty and adaptation as development.

Authoritative position for the social sciences

With this focus on the social conditions (health, education, poverty, etc.) that affect vulnerability rather than on the physical and environmental conditions (impacts themselves and the exposure and sensitivity to them), the contextual discourse also gives a more authoritative position to social scientists and the knowledge they bring to the debate. Indeed, the author teams of the two chapters most often cited above as exhibiting the clearest examples of the contextual discourse (AR4_Ch17; AR4_Ch20) involve more wider participation of social scientists than other chapters more focused on biophysical impacts. Thus, the contextual discourse, by divorcing itself from a concern with the uncertainties and specificities of impacts projection simultaneously distances itself from the kinds of expertise these concerns require, namely from the physical sciences and engineering. By focusing on ‘adaptive capacity’ as the most important component of vulnerability, both assumed to be a characteristics of people, communities, societies, and nations (but also sometimes ecosystems), the contextual discourse gives more space and voice to the social sciences.

4.2 Evolution of the socio-contextual discourse in the AR5

In the AR5 WGII report, the socio-contextual discourse continues to enjoy relative dominance, and has witnessed a certain level of evolution, development, and shift over the seven years between the two reports, reflecting the significant growth in publications on

adaptation, particularly from a more socially-aware perspective. Shifts can be highlighted along a number of different themes.

*Culture, indigenous peoples, and 'traditional ecological knowledge'*¹⁹

While the AR4 did indeed address social aspects of climate change (as described above), the concept of 'culture' and its relationships with climate change were left nearly unaddressed. The AR5, in contrast, now includes a (still relatively short) section on 'Cultural Dimensions' and their relationship to climate change (AR5_Ch12 762-766). Similarly, although the AR4 already recognized the importance of indigenous and 'traditional' knowledge, albeit in a short passage ([find ref again]), the AR5 includes a more comprehensive, if still quite limited discussion of the value of 'local, traditional, and indigenous forms of knowledge' (AR5_Ch12 765-6). In these sections, it is suggested that climate change, primarily through its impacts on natural resources and livelihoods practices, may affect various aspects of culture including worldviews or cosmologies (AR5_Ch12 763-764). A slightly more complete argument is made that, importantly, culturally-specific worldviews influence how people experience and perceive (or do not perceive at all), climate change, risks, the 'need' to adapt, and particular adaptation options (AR5_Ch12 762-4). These of course are important insights that have been surprisingly neglected in previous reports, and, unfortunately, continue to receive little attention in the AR5. That climate change is not perceived or experienced from within the same 'universal' framework of understanding would seem to be not only the subject matter for three pages within a nearly two-thousand-page report, but rather a necessary fundamental starting point from which to understand and address such a global environmental problem.

Adaptive capacity, vulnerability and other concepts

Whereas the more socio-contextual discourse present in the AR4 made frequent reference to the concept of adaptive capacity (indeed, it was positioned as a sort of unifying concept), generally, in AR5 a broader range of concepts are employed to express the social aspects of the adaptation problem. These include the concepts and approaches of human security (e.g. AR5_Ch12), resilience (e.g. AR5_Ch20), and persistent inequalities (e.g.

¹⁹ This particular grouping is not mine, but reflects the section headings of the AR5 report itself and treats these three topics in a closely-related way. There almost seems to be an underlying assumption that it is only, or mostly, 'indigenous' and other 'local' and 'traditional' people (have you ever met an a-local person?) who have things like culture and 'traditional knowledge.' More likely, the subsection was assigned to a contributing author with an anthropological background and their contribution was maintained in one subsection, which would also explain the lack of integration of these insights into the rest of the report.

AR5_Ch13). This wider conceptual range is no doubt due to the generally increased space for the topic of adaptation allocated in the AR5 than in previous reports, and likewise the inclusion of a larger group of authors from different backgrounds. In the AR4 adaptation was given unique focus in only two chapters (AR4_Ch17 and AR4_Ch20), perhaps permitting a higher level of conceptual consistency. Nevertheless, throughout the adaptation-specific chapters of AR5, the general view is expressed that vulnerability, like poverty, is generally associated with a ‘lack’ of something, and adaptation, like development, is about filling that ‘need.’ Indeed, an entire chapter is dedicated to ‘Adaptation Needs and Options’, in which one of the main conclusions is that: ‘the focus has been on tackling the underlying causes of vulnerability such as informational, capacity, financial, institutional, and technological needs’ (AR5_Ch14 836). That the ‘underlying causes of vulnerability’ can be understood exclusively in terms of needs (‘lack’ of something), illustrates the continued proximity to the concept of ‘adaptive capacity’ (related to an understanding of poverty in terms of ‘capitals’, see the following section); that is, something that an actor or system either has, or does not have and can be given, rather than a more structural understanding of vulnerability or marginality (again, see the following section for an alternative understanding). Related to this understanding of vulnerability in terms of capacity, capital, or need, is the continued understanding of adaptation as essentially a local problem with local solutions. Although expressed and implied elsewhere throughout the report, one particular conclusion from the same chapter illustrates quite well the logic of socio-contextual discourse:

Assessments that include both top-down assessments of biophysical climate changes and bottom-up assessments of what makes people and natural systems vulnerable to those changes will help to deliver local solutions to globally derived risks (AR5_Ch14 837).

This single quote contains a number of assumptions of the socio-contextual discourse:

1. knowledge of ‘biophysical climate changes’ necessarily comes from outside expertise (‘top-down’). The understanding the problem is assumed to come from somewhere at the international level, and local understandings of climate change itself are excluded.
2. ‘What makes people vulnerable’ is assumed to exist only at the local level.
3. While the cause of climate change (but not, apparently, vulnerability) can be found at higher scales, it is at the local scale that solutions must (and can) be ‘delivered.’

These assumptions clearly preclude a more structural analysis of vulnerability, which might include examining the role of, say, national and international trade and agricultural policies in

producing ‘local’ vulnerabilities, as well as more generally the role of power relations across scales.

Mainstreaming adaptation into development

The socio-contextual discourse as it can be traced in the AR5 reiterates rather than nuances its central commitment that adaptation can and should be ‘mainstreamed’ into development. For example, a short section treating specifically ‘Adaptation and Development’ cites a number of works that suggest the links between adaptation and development and states that, ‘In many cases, the most attractive adaptation actions are also those that offer development benefits in the near term, as well as reductions of vulnerabilities in the longer term. In developing countries, adaptation has been embedded in the development context in NAPAs and national adaptation strategies’ (AR5_Ch15 882). The authors forget to mention, although it was already included in AR4, that NAPAs in particular have demonstrated all of the same weaknesses and problems as traditional development interventions, including in particular the exclusion of affected groups from decision-making processes (AR4_Ch17 732).

Similarly, the socio-contextual discourse continues to consider ‘mainstreaming’ adaptation into development as a ‘challenge’ (e.g. AR5_Ch14 836), again the forgone conclusion being that adaptation ought to be mainstreamed into development. The overall schema of adaptation continues to be presented in terms of a relationship between developed and developing countries. That is, that adaptation is essentially a developing country concern (e.g. AR5_Ch14 836), a schema which lends itself to reinforcing existing relationships between developed and developing countries and addressing adaptation through funding transfers from the former to the latter, that is, through development ‘aid.’ Similarly, whereas the AR4 mostly avoided such direct language, in the AR5 some authors at least no longer hesitate to employ the term ‘under-development’ (AR5_Ch14 852; AR5_Ch6 416). More generally, that adaptation can and should be implemented through traditional development actors and approaches is typically treated as a forgone conclusion. One chapter even reproduces the World Bank’s definition of adaptation financing: ‘Adaptation financing broadly refers to resources that are deployed to support climate-resilient development’ (AR5_Ch15 880). This is stated without further critique or nuance, or even a phrase of the form ‘The World Bank considers that...’ Instead, the definition is taken as is, whereas in fact ‘climate-resilient development’ is a very particular (and not at all universally-accepted) ‘brand’ or approach to adaptation.

Generally, despite a few novelties (attention, though brief to culture; broadening conceptual diversity), the socio-contextual discourse retains its primary core commitments between the AR4 and AR5:

-The problem of climate change adaptation is essentially understood as a social (but not fundamentally political) problem with local determinants and local solutions.

-Vulnerability and adaptive capacity are assumed to be influenced by a number of ‘multiple stresses’ that are essentially equivalent to the sundry problems already typically associated with poverty or ‘underdevelopment.’ As this is the case, the solution becomes clear. Instead of conceiving independent responses to specific climate change impacts (as the technical and managerial discourses contend), adaptation should be fully ‘mainstreamed’ into development activities.

-The consequence of this is that the discourse opens up a new authoritative role for traditional development actors such as the World Bank and lends the knowledge they produce credence in the climate change adaptation debate, contributing to the definition of what adaptation means and how it should be carried out.

-Similarly, the contextual discourse’s focus on the social aspects of adaptation and dissociating adaptation activities from impacts, impact evaluation, and the expertise and experts involved in these (physical sciences and engineering) opens up authoritative space for social scientists.

Significant attention was dedicated here to the contextual discourse, due to its importance within the report, but especially due to its role as an emerging consensus view on adaptation that gives space to the social scientists and to the actors of development.

4.3 Fragments of a critical discourse in AR4

In contrast to the socio-contextual discourse, a ‘critical’ discourse with some presence in the reports takes a further step and redefines the problem not as climate change impacts nor as a lack of adaptive capacity, but as the structures at different scales that constrain local choices. More generally, the critical discourse has a number of distinct features – it defines the underlying problem as one of political marginalization, evaluates and critiques the solutions proposed by the other three discourses, identifies adaptation as a value-based choice, and underlines the importance of decision-making and the participation of the most vulnerable.

The critical discourse is admittedly difficult to trace in the IPCC AR4 WGII report as it is itself marginalized, yet it appears in a number of identifiable fragments throughout the

report, some of which will be cited here.²⁰ The critical discourse questions the efficacy of solutions proposed by the other three discourses summarized in the table above. This can be traced through a few instances that reflect a tension between different voices in the report. For example, while certain passages in the report explicitly support technical solutions, one also reads that, ‘technological solutions such as seasonal forecasting are not sufficient to address the underlying social drivers of vulnerabilities to climate’ (AR4_Ch17 721). Questioning the optimism regarding possibility of adaptation that is expressed widely in the report, there is also concern that adaptation strategies themselves may have inequitable impacts (AR4_Ch8 417; AR4_Ch7 383). Indeed the critical discourse cautions that adaptation may have inadvertent consequences. For example, increasing irrigation, intended to reduce vulnerability to water stress, may increase infectious disease transmission (AR4_Ch8 417-8), or coastal re-engineering may help some but also may negatively impact other coastal-dwellers due to changed sediment transport (AR4_Ch7 382). In particular, ‘existing or new technology is unlikely to be equally transferable to all contexts and to all groups and individuals [...] Adaptations that are effective in one location may be ineffective in other places, or create new vulnerabilities for other places or groups, particularly through negative side effects’ (AR4_Ch17 734). Generally, the underlying assertion is that adaptation itself (and not just climate change) may produce ‘winners’ and ‘losers.’ This is in stark contrast to the socio-contextual discourse’s assumption that adaptation options can be designed and implemented unproblematically.

A distinguishing feature of the discourse is a focus on not only the social aspects (like the contextual discourse), but the political aspects, of adaptation. Vulnerability can be thought of not so much or not only in terms of being exposed to climate change impacts (technical and managerial discourses), or poverty, lack of adaptive capacity and associated other stresses (socio-contextual discourse), but fundamentally lacking access to decision-making processes that concern adaptation and other issues. In one place in the report this is expressed explicitly: ‘[l]ocal groups and individuals often feel their powerlessness in many ways, although none so much as in the lack of access to decision makers’ (AR4_Ch17 729). Further, ‘[d]ifferential

²⁰ The demonstration that the critical discourse is marginalized in the report along with an in-depth analysis of the IPCC AR4 WGII review process that reveals how this occurred is found in another work (Scoville-Simonds 2014). The reader may at this point with good reason wonder whether the following ‘fragments’ justify identifying and describing the critical discourse at all at this stage, yet the discussion in that work demonstrated that the position that the critical discourse advocates was supported by a number of different reviewers who pushed for its increased inclusion in the report, unsuccessfully. For this reason, I feel that is justified to piece together the ‘fragments of a critical discourse’ here, as it clearly represents a position that was supported by a certain group (perhaps minority) during the IPCC AR4 WGII assessment process, even if, in the end, its appearance in the final report is distinctly marginalized.

power and access to decision makers may promote adaptive responses by some, while constraining them for others [...] even so-called community-based interventions to reduce vulnerability create excluded groups without access to decision-making' (AR4_Ch17 736). Although it is not spelled out explicitly, it could be interpreted, based on this focus on power and access to decision-making, that the critical discourse redefines the problem not as climate change, but as political marginalization.

A single passage fairly well demonstrates several commitments of the critical discourse. In reviewing a case study of Bangladesh's National Adaptation Programme of Action (NAPA), the report findings that,

NAPA consultation and planning processes have the same constraints and exhibit *the same problems of exclusion and narrow focus as other national planning processes (such as those for Poverty Reduction Strategies)*. They conclude that the fairness and effectiveness of national adaptation planning depends on *how national governments already include or exclude their citizens in decision-making* and that *effective participatory planning for climate change requires functioning democratic structures*. Where these are absent, planning for climate change is little more than rhetoric. (AR4_Ch17 732, emphases added).

By showing that the NAPA process exhibits the same problems as the famous PRSP, the critical discourse is thus of the solution that the socio-contextual discourse proposes – conducting adaptation on the model of development. This skepticism comes to its head after a review of the diverse 'barriers' to adaptation which together, 'raise questions about the efficacy and legitimacy of adaptation as a response to climate change' (AR4_Ch17 733). Whereas other sections of the report admit that adaptation may have its limits, this is the only passage in the report that suggests that adaptation as it is presently conceived may simply not be a viable solution.

In this quote regarding the NAPA we also find the clearest expression of what the critical discourse considers necessary for successful adaptation; nothing less than 'functioning democratic structures.' Referring to the three other discourses as presented in the table above, in the technical, managerial, and socio-contextual discourses problems and solutions are defined, variably, by technical experts, by policy-makers, planners, development agencies, and social science researchers. Each of these actors was positioned favorably and the knowledge they offer assigned authoritative weight. That is, each relies on 'expertise', albeit from different sources. By putting the focus on power and decision-making, the critical discourse shifts focus away from asking, 'what must be done about climate change?' and towards the more general question, 'who decides?' Thus it does not replace one kind of expert

and expertise with another. For this reason it is difficult to locate specific ‘solutions’ and practical measures offered by the critical discourse. If the critical discourse offers any solution at all, it is the assertion that effective adaptation depends on ‘functioning democratic structures’ that involve citizens in the decision-making process (AR4_Ch17 732). Rather than prescribing a specific ‘adaptation measure’, the critical discourse, if it prescribes anything, it prescribes a democratic process. It is clear from this that the emphasis is on participation in its fullest sense.

The role of knowledge in this discourse is particularly important. In the other identified discourses knowledge is treated as ‘information’ or ‘data’, generally produced by experts to be used by policy-makers to plan adaptation – that is, it was ‘expertise.’ In the critical discourse it is asserted that ‘[i]ndividuals and groups may have different risk tolerances as well as different preferences about adaptation measures, depending on their worldviews, values and beliefs’ (AR4_Ch17 736). This may seem a self-evident truth, yet surprisingly, this is one of the few instances in the entire AR4 WGII report where it is acknowledged that adaptation inherently involves value-based choices. That is, the ‘right’ adaptation measure for a particular situation is not something that can be ‘discovered’ by sufficient scientific inquiry (or, say, IPCC reports, no matter how massive). The majority of the report is written as if the appropriate solutions to climate change depend only on ‘facts’, not on values, and that, with enough scientific advancement, solutions can be devised and applied from the ‘outside’, be they technical fixes developed by engineers, sectoral plans developed by planners, or ‘socially-aware’ context-specific solutions developed by social scientists and/or development agencies. Yet, if adaptation is a choice, the role of those who must adapt is clearly key.

A specific tension between the contextual and critical discourses is evident in the report, especially in Chapter 17 from which a number of examples for both discourses has been drawn. To take one example where this tension is most evident, the passage containing the block quote above regarding the requirement for functioning democratic structures for the success of adaptation planning (AR4_Ch17 732), clearly a critical stance, ends with a more ‘up beat’ tone: ‘The key role of non-government and community-based organisations in ensuring the sustainability and success of adaptation planning is likely to become evident over the incoming period of NAPA development and implementation’ (AR4_Ch17 732), whereas, it was already cited earlier that, ‘even so-called community-based interventions to reduce vulnerability create excluded groups without access to decision-making’ (AR4_Ch17 736). There is thus a clear tension between the contextual discourse, expressing optimism about the

possibility of achieving adaptation through traditional (and especially ‘local’, ‘community based’) development interventions, and the critical discourse, which is more skeptical about the success of such interventions and instead suggests that real adaptation requires real change in the power structures determining access to decision-making.

To summarize, the critical discourse takes the most ‘radical’ position with respect to the problem of climate change adaptation. Indeed, it decenters the question of adaptation altogether and asks wider questions about the nature of power relations in the world that limit the actions and choices of marginalized groups, not only but also in facing climate change. Unfortunately, little more can be said about the critical discourse based upon the IPCC AR4 WGII as a resource as it can only be located in the report in traces and fragments. Indeed the majority of the examples above come from a single chapter (AR4_Ch17), but even there it is difficult to trace out, given the dominance of the contextual discourse in that and other chapters.

4.4 Evolution of the critical discourse in AR5

In the different adaptation-specific chapters of the AR5 WGII report, the critical discourse can be traced in a number of different ways, and certainly more fully than in the case of the AR4. That is, the AR5 provides somewhat greater space for the treatment of adaptation as an inherently political problem.

Ethical dimensions

Refreshingly new, though surprisingly short, is a section on the ‘Ethical dimensions of adaptation’ (AR5_Ch16 925-6). Though brief, this section at least points out that climate change adaptation is fundamentally an ethical and social-justice issue (AR5_Ch16 925). The AR4 largely failed to clearly state this anywhere in the report; indeed, it seemed to attempt to avoid such ‘politically-charged’ issues altogether. That the issue of developed countries’ responsibility to compensate vulnerable countries and groups for climate change impacts is allocated two lines of text (AR5_Ch16 926) and identified summarily as ‘a contentious issue’ (AR5_Ch16 917), suggests that it is not an issue that the IPCC reports are currently able to address. Unfortunately, in this short section these issues are dealt with briefly and are awkwardly couched in the terms of ‘opportunities, constraints, and limits’ according to the predefined scope of the chapter in which it appears. Nevertheless, as it will be seen, adaptation as a political issue is taken up in a scattered way in other areas of the report (except the issue of compensation, which is not addressed elsewhere).

Adaptation winners and losers, adaptation as a value-based choice?

As in the AR4, the critical discourse again takes up the role of evaluating and critiquing existing adaptation solutions. As compared to the few critiques in the AR4, in various places throughout the AR5 it is recognized that adaptation solutions may indeed have unintended consequences and negative effects (e.g. AR5_Ch12 762) yet it is also recognized that few evaluations of adaptation interventions actually exist (AR5_Ch13 815-6). More generally, the idea that adaptation solutions (and not just climate change itself) produce both ‘winners’ and ‘losers’ is given further emphasis in the AR5. The report even includes a (short) section on ‘maladaptation’ (AR5_Ch14 858-859). In a more nuanced way it is stated that,

differences among stakeholders regarding adaptation options may result in some actions being simultaneously perceived as adaptive and maladaptive [...] a challenge in adaptation planning and implementation is determining who decides what options are adaptive or maladaptive and successful or unsuccessful (AR5_Ch16 917).

Finally here, although somewhat obscured, is the fundamental question of governance – who decides? Like the AR4, much of the AR5 proceeds (through nearly two thousand pages) as if adaptation options and projects can be discussed, designed, and implemented without addressing fundamental questions such as values, choice, and governance. While it is recognized that values are not universally-shared (AR5_Ch16 925), and the importance of participation in decision-making processes is cited sporadically (e.g. AR5_Ch12 765), it is scarcely mentioned in the report that adaptation is fundamentally a value-based choice.

Power relations across scales

As compared to the socio-contextual discourse which understands adaptation as essentially a local problem with local solutions (vulnerability and adaptive capacity being locally-produced and determined), the critical discourse highlights the role of power relations across scales in producing vulnerability, adaptation options, and constraints. For example it is suggested that a, ‘large number of studies have emerged since the AR4 that focus on how local adaptation efforts are constrained by higher levels of governance, such as state or federal governments or private companies. This has led some to question whether it is appropriate to consider adaptation as an exclusively local process’ (AR5_Ch16 917). Two paragraphs are even dedicated to ‘cross-scale dynamics’ in determining vulnerability, such as the influence of global markets at the local level (AR5_Ch16 918). Similarly, a focus on ‘capitals’ (similar to the socio-contextual’s focus on ‘adaptive capacity’) is critiqued for ‘not sufficiently explaining wider structural processes (e.g., policies) [...] and eclips[ing] power dynamics and

the position of households in class, race, and other dimensions of inequality' (AR5_Ch13 798). 'Wider structural processes' that are cited include 'the spread of infectious diseases, rapid urbanization, and economic globalization' (AR5_Ch13 799). In this case, 'stressors' are understood to be not only local but extra-local factors that influence local choices:

Stressors include climatic (e.g., shifts in seasons), socioeconomic (e.g., market volatility), and environmental (e.g., destruction of forest) factors, that interact and reinforce each other across space and time to affect livelihood opportunities and decision making. Stressors that originate at the macro level include climate change, globalization, and technological change. [...] Which specific stressors ultimately result in shocks for particular livelihoods and households is often mediated by institutions that connect the local level to higher levels. Moreover, inequalities in low-, medium-, and high-income countries often amplify the effects of these stressors. This is particularly the case for livelihoods and households that have limited asset flexibility and/or those that experience disadvantages and marginalization due to gender, age, class, race, (dis)ability, or being part of a particular indigenous or ethnic group. (AR5_Ch13 799)

This excerpt can be seen in direct contrast with the socio-contextual discourse's view of adaptation and vulnerability as a local problem in which climate change itself is the only extra-local factor considered to affect the local level. In the critical discourse, vulnerability and adaptation options are influenced by extra-local factors in addition to climate change. This, of course, recalls a political ecology approach in which factors at higher scales must always be taken into consideration when seeking out the root causes of 'local' problems.

Regarding adaptation solutions, in the AR5 as in the AR4, the critical discourse is short on practical recommendations. Nevertheless, the final chapter of the first part of the AR5, positioned as a sort of summary or synthesis of the adaptation-specific chapters (AR5_Ch20 1106), concludes that to address climate change may require 'transformational' changes, including within the political sphere. In fact, other types of changes,

are often constrained by larger systems and structures, including financial, political, legal, social, economic, ecological, and cultural systems that define the boundaries for action. The "political sphere" is where systems and structures are transformed (intentionally or unintentionally) through politics and social movements, or through changes in social and cultural norms and power relations (AR5_Ch20 1122).

How, finally, power relations may be transformed is an age-old question that, apart from the passing reference to social movements, is not addressed in that chapter. At the very least, however, it seems that the definition of the climate change adaptation problem as an inherently political one is at least on the table.

Nevertheless, traces of the critical discourse continue to be found in relatively scattered fragments. Their collection here in one place may give the inaccurate impression

that these issues are actually emphasized or dealt with in a systematic manner in the AR5 report. They are not. Rather, they typically appear as passing comments, isolated lines of text citing one or two authors, then abandoned. Not only are the issues not addressed, it can hardly be said that they are really raised in the first place. The critical discourse is still marginal by far compared to the socio-contextual discourse.

5 Conclusions

Thus far, this paper has identified the characteristics of two adaptation discourses and followed their evolution through the IPCC AR4 and AR5 WGII reports: First, a socio-contextual discourse which defines the adaptation problem as essentially a local and social (but not political) one, and proposes ‘mainstreaming’ adaptation into existing development actions as a solution; and second, a critical discourse which questions the straightforwardness of such an approach, defines climate change adaptation as a fundamentally political problem in which vulnerability at the local level must also be explained in terms of extra-local factors, maintains that adaptation decisions are inherently a question of conflicting values among diverse stakeholders, potentially creating both ‘winners’ and ‘losers’, and suggests that solutions must also imply radical changes on a political level (i.e. power relations). While both discourses reflect contributions from the social sciences to the adaptation debate, they propose significantly different definitions of the problem.

The above discussion has also highlighted that the socio-contextual discourse is relatively dominant in the report as compared to the critical one. This raises the concern that the social science contributions to IPCC reports, while clearly growing in magnitude with successive assessment periods, continue to demonstrate an inability or unwillingness to fully address more political and critical aspects of the adaptation problem.

Two points remain to be explored in a later version of this paper. First, it will be demonstrated that in both the AR4 and AR5 reports, the important and more widely-read Summaries for Policymakers (SPMs) reflect some contributions from the socio-contextual discourse but no significant contribution from the critical one. That is, in the official messages of the IPCC, climate change adaptation can be considered as a social, but not a political, problem. While it is already apparent from the discussion above that there exist significant constraints to the range of debate and views that can be expressed within the IPCC reports (e.g. the marginalization of the critical discourse in the full reports), it remains to be shown that a further stage of marginalization and occurs through successive stages of summarization.

That is, though some critical voices may be heard in the full report, they are successively ‘organized out’ of the official summaries.

A second point to explore then is how this process can be explained. A future version of the paper will examine the report writing and review process through the analysis of the IPCC report draft, comment, and review materials. Such an analysis for the AR4 report using this extensive empirical dataset has already been performed but has not been presented here, as it could not yet be compared with a similar analysis for the AR5 (the AR5 review materials were released very recently and represent a very large data set). The AR4 analysis suggested that a number of points compatible with the critical discourse were indeed present in earlier drafts of certain chapters and were repeatedly supported by report reviewers. Nevertheless, critical messages were ‘toned down’ or removed in successive chapter drafts and in the report summaries. While it is easy to jump to the conclusion that government reviewers or delegates were responsible for removing ‘too political’ messages from the report, this is actually not the case. Rather, it appears that chapter authors themselves consciously removed controversial elements from their material in order to present a vague but widely-acceptable ‘consensus’ view that could garner support from a wide coalition of actors including social scientists, government delegates, and in particular, development agencies (who were also involved in the report review process). The intention, it appears, was to ‘get the social scientists’ foot in the door’ on the issue of adaptation, and to do so they chose the path of least resistance, although this meant compromising critical voices. A similar analysis for the AR5 remains to be performed.

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