16

Controversies

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Overview

Over three decades, the Intergovernmental Panel on Climate Change (IPCC) has been no stranger to controversies. Given its institutional character as a boundary organisation working between science and policy, it is no surprise that IPCC reports often reflect wider controversies in the scientific and political life of climate change, especially those concerning its consequences and potential solutions. In this chapter, we explain why controversies about the IPCC's knowledge assessment are inevitable and point out how the IPCC could use controversies for adapting and developing its assessment processes in constructive ways. That is, we show how controversies serve as 'generative political events' for the IPCC's own learning process. To do so, we classify IPCC knowledge controversies into four types (*factual*, *procedural, epistemic* and *ontological*) and, using two illustrative cases, distinguish between controversies that the IPCC *triggers* and those that the IPCC *absorbs* into its knowledge assessment.

16.1 Introduction

Scientific or knowledge controversies do not have a good reputation. They are thought to reveal the uncertainty of scientific knowledge, to undermine the authority of science, and to slow down the quest for 'universal truth'. It may seem that controversies are best avoided. Yet, in practice, controversies are routine in the production of scientific knowledge. They are important drivers of scientific progress. They are also expressions of the inherent 'social games' (Skrydstrup, 2013) embedded in all human activities. In the case of climate change, controversies have been used to discredit the work of climate scientists –and in some cases they are deliberately manufactured for the purpose of stalling policy regulation (Oreskes & Conway, 2010). However, controversies have also

https://doi.org/10.1017/9781009082099.020 Published online by Cambridge University Press

contributed to deepening the scientific understanding of climate change – its impacts and potential solutions – and have led to increased transparency and reflection in scientific practices. The Climategate affair that erupted in November 2009 is a good example of this (Raman & Pearce, 2020; see also **Chapter 6**).

From a science and technology studies (STS) perspective, controversies offer a good entry point for studying the production of scientific knowledge and investigating how science and technology transform society (Pinch, 2015; Jasanoff, 2019). STS researchers may disagree amongst themselves about precisely what constitutes a 'scientific controversy'. Nevertheless, they would agree that controversies can be regarded as key moments that open the black box of scientific facts and provide a lens through which to explore the solidity (or the fragility) of the institutions that produce scientific knowledge, as well as those who make decisions based on science. By following controversies, researchers are better able to understand 'science in the making' and 'science in society'. As Pinch (2015) points out, it is during a controversy – or a 'moment of contention' – that the normally hidden social and cultural dimensions of science may become more explicit. Given that at such moments knowledge claims become subject to public dispute, knowledge controversies can act as 'generative events' that create an opportunity to arouse a different awareness of the problem and facilitate the negotiation of new practices and procedures (Stengers, 2005; Whatmore, 2009).

In this chapter, we first look at different types of knowledge controversies that have invested the IPCC, before then highlighting the role of the organisation in both generating and stabilising wider political controversies. In doing so, we view the IPCC as an institution that establishes, stabilises or disrupts the knowledge order about climate change, its impacts and potential solutions (see **Chapter 12**).

16.2 A Typology of IPCC Controversies

Controversies have been central objects of study in the sociology of scientific knowledge and STS since the 1970s (Pinch, 2015; Jasanoff, 2019). Controversies have become a method by which to study the complex entanglement between science and society. Broadly speaking, controversies are 'situations where actors disagree' – that is, they are *moments* of contention that 'begin when actors discover that they cannot ignore each other' and 'end when actors manage to work out a solid compromise to live together' (Venturini, 2010: 261). Controversies usually come to an end through the process of 'closure', the point in which an agreement emerges.

Controversies can be distinguished from 'scandals' or 'affairs' – the transgression of values that are dear to a society. Also, a distinction is often made between scientific and political controversies, typically by the different processes of closure. While scientific controversies are considered to be closed through the application of

https://doi.org/10.1017/9781009082099.020 Published online by Cambridge University Press

epistemic and methodological standards, political controversies are thought to be resolved by the negotiation of political and economic interests (Pinch, 2015). However, the entanglement between science and society tends to blur this boundary. Controversies are 'the crucible where collective life is melted and formed' (Venturini, 2010: 264) such that the science–society boundary is unremittingly constructed, deconstructed and reconstructed during a controversy.

In the context of climate change, scientific controversies rarely remain confined within the scientific domain. Studying controversies therefore facilitates exploration of the underlying dynamics of science and its relations with society (Limoges, 1993; Whatmore, 2009). This does not mean that all scientific controversies spark wider societal disputes. But controversies get particularly 'hot' during politically charged situations, for example when the Summaries for Policymakers (SPMs) are approved (see **Chapter 20**) – or when IPCC conclusions enter public debate.

Below, we classify knowledge controversies surrounding the IPCC into four types according to their 'origin' – whether they emerged from *factual errors*, *procedural irregularities*, *epistemic disagreements* or *ontological disputes*. These types of controversies are not mutually exclusive.

Factual errors: Controversies have occasionally arisen from factual errors contained in IPCC reports. Most prominent was the erroneous statement about the melting rate of the Himalayan glaciers in the AR4 Working Group II (WGII), which surfaced early in 2010. This error gained widespread media attention at the time and, following the 2009 Climategate affair, further fuelled public scrutiny and criticism of the IPCC (Beck, 2012). The controversy led the UN and the IPCC to ask the InterAcademy Council (IAC) to undertake a review of the procedures of IPCC assessment and to make recommendations for change. This controversy was defused by the IPCC revising its procedures and improving its communication practices in response to the IAC recommendations (see **Chapter 3**).

Procedural irregularities: A second way of characterising controversies that have erupted around IPCC reports are those that have been caused by irregularities – or claimed irregularities – in the IPCC's own internal procedures. A prominent example is the controversy that followed the AR2 WGI plenary meeting. This concerned the allegation made by climate sceptics against the IPCC that 'unauthorised' alterations had been made to the text of WGI's Chapter 8 on climate detection and attribution after the final IPCC approval plenary had closed, hence violating its own rules of procedure (Lahsen, 1999; Edwards & Schneider, 2001; Oreskes & Conway, 2010). Despite the accusation being unfounded, this Chapter 8 controversy exposed unclear rules of peer review and led the IPCC to formalise its rules of procedure and to add the 'Review Editor' role for overseeing the review process (see **Chapter 11**).

Epistemic disagreements: A third set of controversies arises from disputes amongst scientists and experts about how particular statements about the current

https://doi.org/10.1017/9781009082099.020 Published online by Cambridge University Press

state of knowledge should be crafted and communicated. These controversies are grounded in epistemic disagreements *within* science about how valid, reliable and/or useable knowledge is best generated and assessed. Some of these controversies remain largely contained within the scientific community and the IPCC, like the one regarding projections of future sea-level rise in AR4 WGI (O'Reilly et al., 2012; see Box 12.1). Others, however, have the potential to trigger wider political controversies. For example, calculation of the statistical value of human life in AR2 WGIII led to political conflict between economists and developing country delegations (see Box 16.1). Similarly, the so-called 'hockey-stick graph' – used prominently in AR3 WGI – triggered wider disputes both within and beyond the palaeoclimate science community about the reconstruction and representation of millennial scale temperature change (Zorita, 2019). While an iconic figure, the hockey-stick graph is one of the most contested visualisations in the history of climate science (see **Chapter 25**).

Ontological disputes: A fourth type of controversy relates not to how questions are answered by the IPCC but, rather, which questions are asked in the first place and by whom (Venturini & Munck, 2021). Here, disputes emerge about the scope of the problems to be assessed by the IPCC and the values and worldviews in which its assessment work is rooted. For example, the IPCC has been criticised for its narrow focus on quantitative modelling analyses and for being heavily dominated by natural science disciplines, i.e., a lack of epistemic plurality (Hulme, 2011b; see also **Chapter 12**). Similarly, the IPCC is criticised for poorly engaging with indigenous knowledge about the climate (Ford et al., 2016; see **Chapter 13**). Although these ontological disputes in IPCC assessments are yet to spark public controversy, growing calls for greater ontological diversity might push the IPCC into considering further reforms if it is to address the broader social and cultural dimensions of climate change.

16.3 Triggering and Absorbing Controversies

As well as categorising IPCC controversies according to their origins, another way of looking at knowledge controversies is to examine how IPCC assessments get entangled with wider (geo)political disputes. Here, we can distinguish between the IPCC *triggering* wider political controversies and the IPCC *absorbing* external political controversies. To illustrate this, we consider two particular cases from earlier stages in the IPCC's history. The first is the controversy in AR2 WGIII about the economic valuation of climate change damage – in particular, monetary valuation of mortality risk from climate change (see Box 16.1). The second case is the contested political negotiations over the methodology and accounting rules for calculating forest carbon sinks in the approval of the 2000 Special Report on Land Use, Land Use Change and Forestry (LULUCF) (see Box 16.2).

https://doi.org/10.1017/9781009082099.020 Published online by Cambridge University Press

Box 16.1
The controversy over the 'value of human life'

In July 1995, the IPCC WGIII session in Geneva was in disarray. Government delegations were supposed to approve the AR2 WGIII SPM, but the approval process was stalled due to a bitter dispute over the economic valuation of climate impacts addressed in Chapter 6 of the report (Masood & Ochert, 1995). The authors of this so-called 'social costs chapter' had reviewed the literature on the estimated monetary value of the costs and benefits of climate change, including that assigned to human mortality. The 'value of human life' number given by the authors became the subject of intense debates because it valued the lives of people in developed nations 15 times higher than those in developing nations. Delegates from developing countries and environmental groups furiously criticised this estimate and called for the chapter to be rewritten or else to be removed entirely (Masood & Ochert, 1995).

The chapter authors refused to revise their calculation, instead defending their approach (Pearce, 1997). They insisted that most attacks against their valuation were rooted in the misreading of what is actually meant by the term 'value of statistical life' (VOSL). Notwithstanding the confusing terminology, VOSL was not representing the *value* of life. It measured people's attitude to mortality risk – or more precisely, people's willingness to pay to avoid the risk of death. Because what people are willing to pay is constrained by their ability to pay – i.e., their income – VOSL estimates necessarily vary between rich and poor. For this reason, the chapter authors argued that their regionally differentiated VOSL estimates simply reflected 'a fact of life' (Fankhauser & Tol, 1998).

Interestingly, the IPCC authors' rebuttals revealed how they demarcated 'science' (economic valuation) from 'politics' (intergovernmental negotiations). Some criticisms were rejected as attempts to 'hijack an essentially scientific process for political and ideological ends' (Pearce, 1996: 8). This also points to a difference between economists and general publics in their views on the notion of monetisation. Economists often use money as a common metric for the cost-benefit analysis – a sort of a 'politically neutral measure of social value' (Demeritt & Rothman, 1999). Irrespective of the technicality of valuation, however, monetary estimates inherently carry political and ethical implications (Fearnside, 1998). The very idea of monetising human lives was indeed the reason for the moral outrage of developing countries.

A few months later, after the disarray of the Geneva meeting, the AR2 WGIII SPM was nevertheless approved, and WGIII's Chapter 6 kept intact. But the wording in the SPM was modified to effectively disavow many of its conclusions by stating that '[t]here is no consensus about how to value statistical lives or how to aggregate statistical lives across countries. Monetary valuation should not obscure the human consequences of anthropogenic climate change damages, because the value of life has meaning beyond monetary considerations' (Bruce et al., 1996: 9–10). This change in the SPM was a compromise acceptable to developing nations, but the underlying ethical question about the monetisation of human life remained unanswered.

Box 16.2
The controversy over accounting rules for forest sinks

Within the UN Framework Convention on Climate Change (UNFCCC), the concept of biological sinks from land use activities such as afforestation and reforestation has always been at the centre of political disputes (Fry, 2002). Throughout the 1990s, several developing countries raised concerns that an inclusion of forest sinks in the Kyoto Protocol would be a 'loophole' to delay early mitigation efforts. Despite such concerns, the Protocol allowed carbon removals by forest sinks to be accounted for in meeting emissions reduction commitments. This marked the beginning of a long and complex process of political struggle – what Fry (2002) described as 'twists and turns in the jungle' – to determine the scope and limit of forest sinks.

Due to a lack of consensual knowledge and no shared normative commitments among negotiating parties – the situation in which Lövbrand (2009) called 'epistemic chaos' – the carbon sink negotiations after Kyoto became a tug of war between two opposing political positions (Lövbrand, 2004). On the one hand, a group of industrialised economies including the United States, Canada and Japan viewed sinks as a 'cost-effective alternative' to emissions reduction. On the other hand, the European Union (EU), some developing nations and most environmental NGOs considered sinks an 'obstacle' to serious efforts to cut emissions from fossil fuels and thus argued for the restricted use of forest sinks. The controversy was so intense that negotiators could not agree on even a simple technical question about the definition of a forest (Fry, 2002).

Under this highly politically charged atmosphere, the IPCC was asked to prepare a Special Report on LULUCF to set the scientific context for the negotiations. Although the IPCC was expected to insert 'science' into politics and hence tame the controversy, the IPCC instead became the site of politicised negotiations about forest science (Fry, 2002; Fogel, 2005; Lövbrand, 2009). During the planning and writing of the Special Report, IPCC authors were attacked from all sides. The IPCC plenary discussions on the SPM approval were nearly as intense as the negotiations at the UNFCCC Conferences of the Parties. Every word in the SPM was subject to close scrutiny from government representatives who sought to shape its conclusions (Fogel, 2005).

Notwithstanding the initial expectations, the IPCC Special Report on LULUCF by itself could not end the sink controversy. Due to a lack of agreement on the issue, the COP6 (Conference of the Parties to the UNFCCC) negotiations in the Hague collapsed. However, the US withdrawal from the Kyoto Protocol changed the political landscape of the negotiations. For the sake of 'saving the Kyoto Protocol', the EU and those parties critical of forest sinks compromised by agreeing to more generous sink provisions. This led to the adoption of the Marrakesh Accords at COP7 in November 2001, which marked a turning point at which sink negotiations moved from 'epistemic chaos' towards 'epistemic validity' (Lövbrand, 2009).

Continued

Box 16.2 (cont.)

Although the approval of the Special Report on LULUCF became the site of a politicised debate, the IPCC's engagement nevertheless certified the abstract sink concept as a scientifically sound mitigation strategy, contributing to the closure of the controversy (Lövbrand, 2009). And yet, whilst political controversy receded, the ethical question about using terrestrial carbon sinks as a substitute for reducing fossil carbon emissions remained unresolved. This ethical concern over forest sinks has lingered, and recently resurfaced with the increased attention being paid to the role of afforestation for meeting the Paris climate goals (Carton et al., 2020).

The two cases illustrate different ways in which the IPCC became embroiled in political controversies. For the dispute over the 'value of human life', the IPCC itself was a trigger for political and ethical contestation among different actors. On the other hand, in the forest sinks dispute, the IPCC was drawn into the controversy by the UNFCCC with an expectation that the IPCC would absorb and defuse political conflict. What these two cases illustrate however is how epistemic controversies within the IPCC are inevitably and intricately bound up with normative disputes in political negotiations within the UNFCCC. At the same time, both cases reveal ethical questions that remained unresolved even after the closure of political controversies. This suggests the likelihood that the IPCC will face similar ethical and ontological controversies in the future.

16.4 Achievements and Challenges

Despite often appearing unwelcome in science, controversies need not always be feared. While sometimes a destructive force, controversies can also act as 'generative events' that create new opportunities for organisational learning (Whatmore, 2009). Controversies are likely unavoidable for the IPCC and therefore the management (or at least acknowledgement) of controversy has to be an integral part of IPCC activities.

In order to maintain its epistemic authority amid controversies, the IPCC has tended to engage in 'boundary work' (Gieryn, 1995), discursively separating its work from politics and hence maintaining its appearance of 'policy neutrality' (see **Chapter 21**). Through this boundary work, the IPCC seeks to contain *scientific* controversies within its domain, and at the same time to keep *political* controversies at bay. However, as seen in the case of the 'value of human life' controversy, the IPCC assessment itself can spark intense political controversies. Inversely, as seen in the case of the Special Report on LULUCF, the IPCC can be

brought in to pacify political controversies. Scientific and political disputes are thus often inseparable during controversies.

In some cases, the IPCC succeeds in stabilising epistemic controversies and black-boxing scientific facts. As a result, the wider ethical or political disputes from which such controversies emerged – or which they provoked – also reach a point of closure, at least temporarily. Nevertheless, some normative disputes are often not fully resolved and may therefore resurface in other circumstances. The emergence (and cessation) of controversies is always context-dependent.

Given the complex ways in which climate change is embedded in social, economic and political worlds, the IPCC will continue to find itself always positioned on the brink of controversy. There is no easy escape for the IPCC from this exposed position. Perhaps, only through being a learning organisation (see **Chapter 6**) – constantly revising procedures for knowledge assessment and developing new modes of engagement with diverse audiences – will the IPCC be able to live through moments of controversy. The learning from past controversies might also help the IPCC anticipate issues on the horizon from which unseen controversies might arise in the future.

Three Key Readings

Lövbrand, E. (2009). Revisiting the politics of expertise in light of the Kyoto negotiations on land use change and forestry. *Forest Policy and Economics*, 11(5–6): 404–412. http://doi.org/10.1016/j.forpol.2008.08.007.

This article offers a valuable case study of the 'carbon sinks controversy' that enveloped the IPCC in the UNFCCC negotiation; Lövbrand emphasises how scientific controversies in climate change are always bound up with political questions about power and governance.

Edwards, P. N. and Schneider, S. H. (2001). Self-governance and peer review in science-for-policy: the case of the IPCC Second Assessment Report. Chapter 7 in: Miller, C. A. and Edwards, P. N. (eds.) *Changing the Atmosphere: Expert Knowledge and Environmental Governance*. Cambridge, MA: MIT Press. pp. 219–246. http://doi.org/10.7551/mitpress/1789.003.0010

This chapter offers a useful case study of how the alleged controversy over the rule of procedures led the IPCC's own learning to set the clear rule of peer review process.

Whatmore, S. J. (2009). Mapping knowledge controversies: science, democracy and the redistribution of expertise. *Progress in Human Geography*, 33(5): 587–598. http://doi.org/10.1177/0309132509339841.

This article offers a useful guide to how to think about controversies in science in general: why they occur, who perpetuates them, what is at stake.