The IPCC, Consensus and Science

In all of the claims and counterclaims made in recent weeks about climate change, climate scientists and the IPCC, one aspect of the debate which rarely gets examined in any detail is what is meant by the idea of 'consensus' in science. Advocates say that there is a strong scientific consensus about the reality of anthropogenic global warming. Detractors will say that scientific knowledge is not produced by consensus. Mike Hulme examines the different meanings that people attach to the idea of consensus in science, and how it is used by the IPCC.

One of the more frequent criticisms made of the IPCC is that it works to create a scientific consensus about climate change. Critics claim that science doesn't work by consensus, but rather by testing and refuting hypothesis on the basis of evidence. Just because 95 per cent of scientists agree about something doesn't make it true.

On the other hand there are those who point to the IPCC consensus about climate change as being its central characteristic which gives validity and relevance to its conclusions. 'The consensus of the world's leading scientists is that it is very likely that most of the recent warming is due to greenhouse gas emissions'. This is just the sort of clear and considered judgement that politicians like to hear – and it was they after all who set up the IPCC in 1988 to deliver just this form of knowledge.

It seems that not only do we disagree about climate change, but we disagree about whether or not we should even be reaching a consensus about it.

The term consensus typically refers to a commonly agreed position, conclusion, or set of values. It is most commonly used with reference either to group dynamics or to broad agreement in public opinion. For example, over 20 years ago Denmark introduced the idea of Consensus Conferences into the national politics in that country as a way to strengthen democracy. But why should a process for reaching a common position in politics be adopted as a way of generating scientific knowledge? After all, politics is about opinions or beliefs; science surely is about facts and evidence.

The problem is that in areas of science which are seeking to understand the behaviour of large complex systems which can't be replicated in the lab, it is very hard if not impossible to apply the scientific litmus test of falsification through experimentation. And climate change is one such area of science. We have scientific theory, we have empirical observations. What we haven't got are lots of different Earths that can be experimented on in controlled conditions. Virtual climates created inside computer models are the best we've got.

All of this means that climate scientists frequently have to reach their conclusions on the basis of the partial, and sometimes poorly tested, evidence and models available to them. And when their paymasters - elected (or non-elected) politicians - ask them for advice, as in the case of the IPCC,

opinion and belief become essential for interpreting facts and evidence. Or rather, incomplete evidence and models have to be worked on using opinions and beliefs to reach considered judgements about what may be true. This approach is a well recognised for evaluating some forms of scientific evidence, and quite sophisticated procedures have been established to make it work. Bayesian statistics and expert elicitation are two such methods, and they both lend themselves to consensus-making.

But these 'consensus methods' don't suit everyone. For some scientists, statements that commence with 'We believe ...' sound much too close to religious creeds or political manifestos to be accredited as reflecting scientific knowledge. I have heard scientists of many stripes – both those accepting the scientific orthodoxy about climate change and those disputing it – say "it's not about belief, it's about evidence".

Reaching consensus about climate change, recognising that these statements emerge from processes of deliberation and discussion rather than from pure observation, experimentation and falsification, can therefore be an uncomfortable thing for scientists and public alike. Scientists need to be prepared to argue about their 'considered opinions', to embrace consensus but without closing down argument or suggesting that matters are settled. And the public need to recognise that sometimes consensus is the best that science has to offer about a topic, especially when decisions need to be made by politicians – even if the decision is to do nothing.

Yet there are two final observations to make about how the IPCC does consensus. First, consensus-making in science can be done to reveal the extent of expert disagreement rather than to erase it. For example, expert elicitations – which the IPCC have not used – would reveal where the 'centre of opinion' lay in expert beliefs, whilst also showing explicitly how wide the spread of opinion was. After all, consensus processes only make sense – whether in politics or in science – if there *is* disagreement. If all scientists agreed about every aspect of climate change there would be no need for a consensus process.

The second thing is to note that the rules of IPCC procedure do not demand that a consensus be reached about all aspects of their assessments. If consensus is judged not possible in any area of the reporting process, then 'differing views shall be explained, and upon request, recorded'. This provision applies as much for the final Summary for Policymakers – where this option has never in fact been enacted – as it is for the detailed technical chapters, where differences in the assessed literature have more frequently been retained.

Understanding the nature of consensus-making in science, the circumstances when it is appropriate to embark on and that it is process that is never closed, would improve the quality of the conversation about climate change between scientists, politicians and public.

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