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Climate change is on the mind of many scientists, beyond experts in the field. It is where science diplomacy has been at work in the month preceding the climate change conference, COP21, opening in Paris on 30th November 2015. But does science diplomacy make a difference? EuroScientist talks to various experts in the field and analyses the likely outcome of such talks.

Climate diplomacy in full steam ahead of COP21

Despite the key role science has to play in discussions, politicians make the ultimate decisions

The mechanics of science diplomacy have been in full steam mode in preparation for the United Nations (UN) conference on climate change, the 21st Conference of Parties (COP21). It aims to achieve a legally binding and universal agreement on climate change to try and limit global warming. Starting in Paris on 30th November 2015, COP21 is a perfect opportunity to examine the role of science diplomacy in influencing international policy making.

Although there are many hours of discussion ahead, a lot of effort has already been invested in influencing talks prior to the event. The ultimate decisions are out of the scientists' hands. However, experts believe that all of this moving and shaking is influencing the way politicians and policy makers make choices for the Common Good; namely, in this case, to protect us from the possible

devastating effect of climate change.

Science-flavoured diplomacy

What does science diplomacy actually mean? Peter Dogse, co-chair of the UNESCO task force on COP21 and Climate Change, based in Paris, France, defines it as "the science that looks at solving problems, which concerns international relations and common sustainability endeavours." He cites the particle physics laboratory CERN, the International Hydrological Programme (IHP) and the Intergovernmental Oceanographic Commission (IOC) as just some examples of science diplomacy in action.

Science diplomacy will also matter during COP21 negotiations towards a new global climate change agreement. Specifically, the parties involved have to decide on actions that will contribute to limiting global temperature rise to 2°C by 2100. The pressure is on, as current Kyoto Protocol commitments on greenhouse gas emissions run out in 2020.

When it comes to climate change negotiations, “science has driven this whole process since the beginning," says Alden Meyer, director of strategy and policy for the Cambridge, Massachussetts-headquartered Union of Concerned Scientists (UCS) in the USA. He has been at almost all COPs since their inception in the 1990s. He believes the publication of the first Intergovernmental Panel on Climate Change (IPCC) resulted in UN-led climate negotiations, and subsequently, the Rio Treaty.

Evidence-based discussions in action

So how does science diplomacy actually work? Much of the work in advance of COP21 is public awareness. "The main focus now is to consolidate what is known and and to present it in an understandable way," points out Dogse. The work done prior to COP21, ensures that the public and policy makers are aware of "where we are heading and what we can do about it," adds Dogse. He believes that science provides a baseline of the problems but also the solutions. Policy makers and politicians rely on this knowledge as they put together their individual objectives and, subsequently, during negotiations.

A lot of effort has gone into preparing for COP21 negotiations, ahead of the event. This is a process where prior discussions have been held during many scientific meetings. These included the 3rd *UN World Conference on Disaster Risk Reduction* held in Sendai Japan, in March 2015 and the conference *Our Common Future under Climate Change*, in July 2015, in Paris.

In parallel, other meetings that were not geared to climate science also contributed to the debate. For example, science policy events, such as the 2015 World Science Forum, held in Budapest in November, also made a declaration supporting the "use of scientific evidence in policy making."

Prior to that, a call for "decisive action to limit future global emissions” came from a declaration initially signed by 36 Nobel laureate at the *65th Lindau Nobel Laureates Meeting*, in July 2015. Since July, many more have signed the declaration, according to Brian Schmidt, Nobel laureate in physics and astronomer at the Australian National University, in Canberra, who coordinated the declaration.

Many key documents have also been published in the run up to COP21 and 140 countries submitted their proposed contributions to the event to date. For example, Agenda 2030, outlining the latest UN sustainable development goals, was launched at the last UN General Assembly, in New York, USA, in September 2015.

But the main report cited by most experts in advance of the meeting is the IPCC fifth assessment. Dogse emphasises that it is "through IPCC assessments that science policy makers have woken up to the stark reality that they have to do something jointly."

Behind the scenes

Science diplomacy has moved now past the basics of climate science, into topics such as the economic impact of inaction, according to Dave Reay, professor of carbon management at the University of Edinburgh, UK. Politicians and policy makers now “get the importance of climate change as a risk and an opportunity for their nations, businesses, and stakeholders,” he adds.

The debate around climate change inaction has led some scientists to blame democracy and the political order in the Western world, according to Nico Stehr, founding director of the European Centre for Sustainability Research at Zeppelin University in Friedrichshafen, Germany. He recently warned against changing the current political order in an opinion piece published in Nature.

So how effective has science diplomacy been at previous COPs? There clearly is frustration that we are not doing more and not doing it faster, according to UCS Meyer. He adds that this is not a new dynamic and has “been in this process every step of the way since the Rio Treaty".

However, “we're in a much better place to deal with the problems” compared to where the world was in advance of the COP15 in 2009 in Copenhagen, says Nobel laureate Schmidt. He adds that this is partly because the effects of climate change have become much starker in the last five years.

Witnessing such effects has done a lot to convince politicians on the need to act. UNESCO's Dogse feels that this reality and science diplomacy work hand-in-hand as "it is through science that we can say that effects seen can be attributed to climate change. Without science, it would perhaps just be interpreted as freak, but natural conditions, not meriting reductions in greenhouse gas emissions."

Politics versus science

However, Schmidt recognises that “it’s not just a bunch of scientists making the decisions, it is politicians”. The astronomer wants them to use the scientific evidence to make the best possible decision.

Still, some believe that science should not get inter-twined with politics in such as way. “[The Lindau declaration] is a political statement”, says professor Daniel Sarewitz, co-director of the Consortium for Science, Policy & Outcomes (CSPO) at Arizona State University, USA. He adds: “everybody wants to wield authority to support the political perspective that they think is the one that should win the day.” But he thinks that there should be a boundary between science and politics.

He feels that climate change is fundamentally a political, not a scientific issue. “There are infinite options available to nations and societies in thinking how to address climate change," Sarewitz points out, adding: "The only way to adjudicate between those options is through politics.”

The trouble is evidence may not be enough to influence politicians and wider society. “Scientists tend to overestimate the power of their knowledge”, according to sustainability researcher Stehr. He adds: “it takes more than making pronouncements about expected changes in the climate in order to convince citizens and governments to act.”

Some agree that it is difficult to translate science into action. “The negotiations are not carried out by scientists,” but by public servants with a brief from their country of what they are willing to negotiate, according to John Sweeney, professor emeritus in geography at the National University of Ireland, in Maynooth.

Because of this, Sweeney believes that “national self-interest is still going to rule the roost in Paris and we won't see an agreement that's sufficiently strong from a scientific point of view as a consequence”.

Chances of success

The success of science diplomacy in devising effective solutions could also depend on how available evidence is used in practice. For instance, in tailoring the evidence to the specific users instead of relying on knowledge in a one size-fits-all scenario. For climate science to be translated into effective policy, there tends to be “an ongoing relationship between those creating the knowledge and those using it that allows them to understand each other,” notes CSPO's Sarewitz.

Integrating knowledge about climate change into day-to-day decision making is key, according to Dutch expert Arthur Petersen, professor of science, technology and public policy at University College London, UK, who has been involved in all of the IPCC reports. He also was scientific adviser on environment and infrastructure policy for the Dutch Government for 13 years.

Based on his extensive experience, Petersen feels that “the IPCC is a good source of knowledge for the overarching goals but it is not tailored to specific users” and this is a “huge gap.” For instance, in the Netherlands, IPCC findings are translated into national models and scenarios. It is “legally mandated that you use the scenarios of the Dutch Met Office in all kinds of decision making regarding the protection of our delta,” says Petersen.

The IPCC recommendations are “insufficiently connected to people who really have to make the decisions on the ground,” he adds. Petersen says that's “where the challenge now lies for science diplomacy around climate change”

Mixed expectations

For now, perhaps scientists need to manage their expectations. This is important before and during climate talks, according to UNESCO's Dogse. Sustainable researcher Stehr expects Paris will be a failure, primarily, “because it's very difficult, if not impossible, to gain consensus of so many nations”.

However, Dogse thinks that for COP21 "there are expectations but they are more manageable" than in previous talks. He is "pretty optimistic" but warns that it is important to keep in mind that this is an ongoing process, one which first started by "science and diplomacy working together."

Maria Delaney

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