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Sustainable Innovation Forum

Climate Leader Insight: Science for Adaptation Solutions

IPCC Chair Hoesung Lee

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Good afternoon. I'd like to congratulate Climate Action and UN Environment for organizing this multi-faceted and information-packed high-level dialogue, which offers great insights into everything that's going on here in Marrakech.

These are exciting days for international climate diplomacy. Even before the opening of this COP of Action, the Paris Agreement entered into force after the ratification thresholds were crossed in record time. A few weeks ago an agreement to offset the growth in aviation emissions was struck and we've also seen the amendment to the Montreal Protocol to phase down hydrofluorocarbons – which some say could save up to half a degree Celsius of global warming. Even during the COP, we have seen major economies continuing to ratify Paris. The commitment to climate action on the policy side is clear. We can no longer say that governments are ignoring the voice of science. So now, more than ever, the voice of science is needed. Because governments are ready to implement the Paris Agreement, and policymakers are turning to us for the scientific information they need to formulate sound policy founded on robust science and evidence.

People sometimes ask why we need another IPCC report. The Sixth Assessment Report, whose scoping meeting we are now preparing, is going to put a greater focus on solutions than previous assessments have done.

We have a good picture of climate change and its impacts globally, but know far too little about how it is playing out at the local level, which is of course the most policy-relevant.

Improving our understanding of the climate system, for example through enhanced monitoring, better knowledge of processes and improved models contributes to solutions by strengthening disaster risk reduction and understanding potential consequences of climate action.

Generally, we need a better understanding of the economics of climate change – the costs and benefits of action and inaction. We need to improve our understanding of the institutional implications of different policy options.

Because the barriers to a zero-carbon society do not arise in science; after all, we already know enough to take action on the path to a carbon-free economy, and that was one of the key messages of the Fifth Assessment Report in 2013/2014 and its predecessor, the Fourth Assessment Report in 2007. Most of the barriers are economic, social, institutional and political.

That said, there are significant gaps in our knowledge about the challenges and risks associated with some of the technologies that have been mentioned as contributing to a carbon-free economy. These include carbon dioxide removal (CDR), afforestation, and BECCS – the combination of bio-energy and CCS, where CO₂ is absorbed from the atmosphere by growing bio-matter such as trees which are then burned in power plants while sequestering the resulting emissions. We do not yet know enough about the extent to which these technologies can be scaled up, and hence what their potential is. Planting forests to absorb carbon or provide energy would eventually run up against the need for land for food. Examining these questions will be another focus of our forthcoming reports.

There are some important areas of research – many overlapping between science, technology and the social sciences – that we are likely to assess. Decarbonization of electricity generation will involve large-scale deployment of renewables, nuclear and CCS. What are the risks and opportunities here? What do we know about CCS – not only its operational safety, but also the risks of transporting sequestered CO₂ and the long-term integrity of storage? The relationship between behavioural change and greater energy efficiency is fascinating. Climate change and cities – home to over half the world's population – is a growing area of research. Cities pose particular challenges to mitigation and adaptation, as well as opportunities: as new cities are built and existing cities develop, how do planners avoid locking-in carbon-intensive infrastructure. And what are the prospects for sustainable transport, achieving zero-greenhouse gas mobility through renewables-based electricity or hydrogen?

As you know, in addition to the Sixth Assessment Report (AR6) we are preparing three special reports – *Global Warming of 1.5°C*, a special report on climate change and oceans and the cryosphere, and a special report on climate change and a range of land-related issues.

The 1.5° report should improve our knowledge of the timing and specific impacts of warming of 1.5 degrees, which will greatly help with planning the necessary adaptation measures.

Some 2-degree pathways rely on negative emissions or geo-engineering measures during the latter part of the century. They may play a larger role in 1.5 degree pathways, so we need to learn a lot

more about those options, including biomass combustion with CCS, biochar and biomass burial, ocean geo-engineering, and solar radiation management.

For the special report on land use issues we need modelling of the potential location and scale of desertification and land degradation due to climate change. We need to understand the relationships between climate, food production, and human security, including the potential for adaptation and impacts on migration.

This special report is highly relevant as weakening food and water security can undermine development and aggravate the forces leading to human displacement, contributing to instability. And the focus on sustainable land management and food security can also promote adaptation by helping us build resilience.

Thank you

