

## **Yadvinder Malhi Speech**

Thank you, Your Royal Highness, Secretaries of State, Ladies and Gentlemen. It gives me great pleasure to speak on behalf of the community of distinguished tropical forest scientists, who have gathered at the Royal Society over the past two days. We have gathered with the mission of discussing the priorities for how the science community can contribute to the task of understanding and safeguarding the future of the world's precious tropical forests over the coming century. I should note that this science community is a very pragmatic, data-oriented community most usually observed in remote locations amidst muddy boots, leeches and swarms of mosquitoes, so it gives me a perverse pleasure to see my friends and colleagues in lounge suits and to address, if not the smartest, then surely the best-dressed meeting in the history of our subject.

In the course of this meeting we have drafted a memorandum highlighting our key issues, which I will summarise for you now.

First I want to convey a positive message from our community. Too often the contemporary story of tropical forests is purely a narrative of ongoing loss and tragedy, of the retreat of wild nature in the face of relentless human pressure. As a community we recognise that these concerns are genuine, and that tropical forests face multiple challenges in the face of both the direct pressures of deforestation and degradation, and also more cryptic pressures such as overhunting and climate change. However, we also take note of many positive trends underway. This includes the rapid expansion of protected areas, the increasing recognition of the many ecosystem services that tropical forests provide at local and global scales, the remarkable slow down in deforestation in the Brazilian Amazon and in some other countries in recent decades, the observation that many tropical countries are making a transition into net forest gain, and the huge increase in effort in managing and monitoring tropical forests in the context of REDD+. In this context, it is important to recognise the value of human-modified tropical forests, the biodiversity they host and the ecosystem

services they provide, and to support scientific research into the successful restoration and sustainable management of such modified tropical forests. We note that, far from being fragile ecosystems, many forests have the potential to be more resilient to disturbance and change than is generally recognised, but that it is important for the scientific community to identify the limits and thresholds of this resilience.

Further, we have discussed the many recent exciting advances in the technologies and toolkits of tropical forest science, from rapidly expanding networks of tropical forest monitoring sites, to new technologies to scan the three-dimensional structure and chemistry of forests at the scale of whole countries, through to new low-cost DNA analysis tools that enable assessment of the complex biodiversity of tropical forests. These advances have the potential to revolutionise the understanding and monitoring of tropical forests.

We note the rapid expansion of data on tropical forests, exemplified by the free availability of Landsat satellite data archives and the expansion of tropical forest field plots, and strongly advocate the global integration and wider availability of these data. We note the persistence of political and bureaucratic barriers to the sharing of data, even surprising barriers in the context of publicly-funded satellite data, and as a community strongly advocate that these barriers be overcome.

We have identified a number of research needs as priorities for new scientific investment. There is a need for strategic investment in big science coherent across the tropics. This includes basic scientific research into the ecology and functioning of both pristine and human-modified tropical forests, to better understand these complex systems and their response to change. In particular we need to monitor the complex ecology of tropical forests over the coming decades in this era of global change, this Anthropocene. Such an effort needs long-term support beyond the three-year cycle of most research grants, analogous the global monitoring of weather and climate. In the

context of climate change, we particularly need to understand better how rising temperatures in themselves will affect the functioning and composition of the warmest biomes on Earth. While our meeting has focussed on natural science and what it can provide, we note that any effective future for tropical forests must also integrate equivalent insights from social, political and economic sciences

We recognise that the challenge of tropical forest conservation and restoration has many allies and much support within tropical nations, and amongst tropical peoples and scientists. We call for renewed effort to support the development of programmes to enhance and devolve capacity in natural and social forest science in tropical forest nations, through *in situ* support for training and infrastructure inside tropical nations, and international scholarships and grants in tropical forest science and conservation for students and researchers from these nations. Such investment in capacity would assist ecological monitoring within tropical nations, build cadres of in-country experts with an understanding of the multi-faceted value of tropical forests, and facilitate effective dialogue between scientists and decision makers.

Finally, as a scientific community we are committed to investigating and describing on behalf of humanity the glory, mystery and wonder of these biomes, and in providing the science base that can inform policies and strategies to promote their value, conservation and restoration throughout this century of global change, while meeting the needs of tropical forest peoples and nations. We commit to pursuing and enacting the goals outlined in the Memorandum, to furthering these goals among our colleagues, and to meet again to advance these goals. We are determined that there will be a positive future for many of the world's tropical forests and their inhabitants, and as a community stand ready to provide all the insights and support that our scientific experience can provide.