



## OFFICE OF THE PRIME MINISTER'S CHIEF SCIENCE ADVISOR

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### **Comments by Sir Peter Gluckman at Science Agora, Japan: Science in Transition – bridging science, society and policy.**

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The nature of science has changed dramatically in recent decades. From addressing relatively linear questions based largely on the physical sciences, science is now engaged with large, complex and non-linear systems. This shift was fueled by the explosion of biological, environmental and social sciences on one hand, and by advances in computation and statistics on the other. Now science is intimately engaged with the big questions such as climate change, urbanisation, food security, and population aging – the very questions that are of vital interest to all societies. Such systems-level questions inevitably involve many unknowns and solutions are posed in terms of probabilities, tradeoffs, uncertainties and risk rather than the absolutes policy makers would prefer.

The very nature of these questions and the tradeoffs involved in finding solutions means that multiple societal and values-based considerations must be part of the equation – and not just the values that are inherent in complex science (such as when is there a sufficiency of evidence on which to draw a conclusion) but those of society itself.

If the science community explicitly enters such societal values debates, the danger is that science can too easily be co-opted to mask a values-based discussion, even when the scientific consensus is fairly established.

While we cannot avoid engagement with societal values, science must not move away from its singular focus on producing robust and reliable evidence. When science inappropriately enters the domain of public values, it risks being corrupted and trust being undermined.

Think of the issues surrounding global climate change. While the scientific consensus on anthropogenic climate change and its probable impacts is now quite strong, science still manages to be held up as a point of debate and continues to be

inappropriately used as a proxy for the real debates about national economic interests and intergenerational equity; sadly it remains easier to undermine trust in the science rather than have a proper and needed debate over the values involved. It is only when we do that solutions will be accepted.

As science has engaged with such grand societal challenges, the relationship between science and society has changed. No longer can science maintain its traditional (and rather patronising) stance, somewhat isolated from society, pronouncing from the high alter of knowledge; rather it is generally accepted that society has a central role in defining what science is done, how it is prioritised and how it is used. This is not an easy shift for the science community.

And these changes are having enormous impact on how the scientist must engage with the public and politicians. Scientists, like other citizens can freely voice their opinions, but if science is to have a privileged role in the societal discourse, scientists must also be aware of their professional responsibilities in how they communicate, especially in times of public crisis – these are complex nuances and are well pointed out in the revised Japanese code of ethics.

In New Zealand, we are engaged in a major effort to enhance the science-public nexus. The government has released a strategy that has several components. Some are not particularly unique – strategies to enhance STEM education and public engagement with science. But the strategy specifically acknowledges that the science community must become more active agents too.

Two new programmes have been announced – firstly a programme of activities to help science reach parts of the community which have less engagement – for example ethnic minorities including our Maori and Pasifika peoples. Secondly, a platform for participatory science will be piloted next year. This is a hybrid of citizen science and participatory action research, where local communities will be engaged in identifying projects that are locally and scientifically relevant. The aim is to provide seed funding to projects that have scientific, community-based, and pedagogical credibility and will engage the science, school and broader communities.

Earlier today I commented on how science should inform policy. I will not add to those comments except to consider them in the global context. We increasingly appreciate science to be a global exercise for global benefit and the problematic question of how to enhance science advice in the international arena cannot be ignored.

The IPCC process has been an enormous and essential effort but how can we use science to influence policy making at the international level at scales less than that? All said and done, decisions are made every day in the international arena – be it bilaterally, or multilaterally through groups such as G20 or through UN agencies. Too often scientific considerations are either overlooked or added at the last minute, and the discussions are focused uniquely on jurisdictional interests. We need new models for international science advice. Perhaps discussions flowing out of the meeting of the forthcoming UN World conference on disaster risk reduction in Sendai will help point the way.

One model that the APEC Chief Science Advisors and Equivalents are exploring is whether there needs to be greater coordination and integration of national science advisory systems so as to have a more common input to their governments in informing international decision making so science is not used as a debating tool but as common base knowledge.

New thinking is definitely needed and science must evolve if we are to address many common challenges. Thank you.