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### Science for All People

Science, technology and innovation prospects for the post-2015 development agenda

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Commission on Science and Technology for Development  
Seventeenth session  
12-16 May 2014  
Geneva, Switzerland

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Anne Miroux, thank you very much for the kind introduction. I would like to say thank you as well to Andrew Reynolds, the chair of this session, who has brought so much experience and insight to our agenda. Thanks to the commission staff for coordinating the details for so many of our visitors. And please allow me to offer a special thanks to Commission Secretary-General Mukhisa Kituyi. This is an important meeting, with great potential for impact, and the commission's leadership is sincerely appreciated.

For an example of the Commission's excellent work, I would point to the Secretary-General's report prepared for this meeting: "Science, technology and innovation for the post-2015 development agenda". It's a great description of how government, private enterprise, education, NGOs, and others must collaborate to advance human prosperity.

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Fifteen years ago – in 1999 – the Millennium Development Goals were coming into focus. From our perspective now, we know how valuable they have been. But back then, who could have imagined how they would help to change the world? China, India, Brazil, Mexico, Malaysia and other nations were only beginning to emerge as centers of research and innovation. My own country, Rwanda, was struggling to overcome the devastation of genocide. After making historic progress, these nations have emerged as models of possibility and hope – and important sources of scientific support – for other developing countries.

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Today, we are joining in a process to give shape to the post-2015 Sustainable Development Goals. We know that they could be far-reaching, and help to set the environment for science and development for decades to come.

The Commission's analysis recognizes that science touches on every major challenge confronting humanity. It describes the role of science in increasing agricultural production. Providing clean water. Controlling infectious disease. Improving manufacturing processes, and building stronger, more sustainable cities.

Here, however, I must make a very important point: My organization, The World Academy of Sciences, has limited ability to address those problems. The Commission on Science and Technology for Development has limited ability to address these problems. (pause)

We have good intentions, we have knowledge and other resources, and we have excellent partners. But, for example, if we say that agricultural production is our goal, we are talking about a challenge that differs across continents, from region to region, sometimes village to village. Really, it is not one challenge, but hundreds. And so the primary need is for **local** and **national** expertise to address those problems.

The value of the Sustainable Development Goals, as with the MDGs, is to set a framework for action. The framework must be malleable, so that it can be adapted by policymakers, scientists, the private sector, educators and others at *local levels*, but on a *global scale*.

And so I would propose this overarching priority: The SDGs should support development of an effective and efficient innovation ecosystem. (pause)

*Innovation ecosystem* – I love that metaphor. It's holistic. It suggests smooth, efficient operation. But it is much more complex than it sounds. It involves policy – most obviously, research & development spending. It involves law, such as patent and intellectual property law. It involves technology transfer, communication, and partner networks. It may require science diplomacy. And *all* of these things involve political considerations.

Most importantly, building an innovation ecosystem requires a careful consideration of education, from early childhood through PhD study. Just as important, it requires engagement with the public.

For eight years, I served as a government minister in Rwanda, and for much of that time, my portfolio included education. Perhaps you can imagine the challenges: The genocide 20 years ago shattered the country, and its educational system. To rebuild the country, we had to develop a holistic, long-term plan. Under President Paul Kagame, there was a clear recognition: Education, and science education, was involved in most every priority and initiative. It was not only a matter of developing a curriculum or obtaining laptops. If you wanted to rebuild education, you had to consider hunger...health... structural engineering...transportation...security... technology... communication...even foreign policy.

The Millennium Development Goals have had a strong focus on primary education, and that was critically important. But if your children make it through primary school and high school, are there good universities awaiting them? What is the quality of the faculty? Are these universities equipped with laboratories and Internet communications technology?

At TWAS, these issues are central to our mission. We provide more than 300 fellowships every year to young scientists who want to obtain their PhDs. We provide about \$1.5 million each year in small research grants.

We believe that even one PhD scientist plays a crucial role in her country: Not only does she teach, not only does she do research. She becomes a mentor. She might become an adviser to the government or a business consultant. She might be involved in international research teams, and so become a crucial link in global networks.

Clearly, a nation with a weak corps of PhD scientists – and ill-equipped laboratories, and limited ICT infrastructure – will struggle to address its challenges. But every new PhD scientist increases a nation's ability to address these challenges independently, and in genuine partnership with researchers from other nations. PhD scientists build skill, strength and resilience.

Brazil, China, India and Malaysia are among the countries that have built their PhD corps, and in some case their labs are already world-class. Today, each hosts dozens of PhD students and postdoctoral researchers through TWAS Fellowship programmes. All developing nations can learn from their experience. We can, too, as we develop the post-2015 Sustainable Development Goals.

Regarding education, we must also consider the importance of science education and science literacy *beyond* schools, in the wider society. Consider this example: If someone does not understand the basic science about germs and how germs are transmitted, they will be less likely to wash their hands. If a community does not understand the cause and impact of climate change, its people will be less likely to take remedial action.

The question – perhaps the most important question – is: How do we enable communities and nations to build a *culture* of science? Just as the foundation gives support and shape to a building, so the culture of science can give strength to society.

But we would do well to remember that science is not a panacea, and that scientists and engineers do not have all the answers. They can illuminate problems, their causes and impacts, and evaluate possible solutions. But ultimately lawmakers and policymakers must weigh scientific analysis along with other considerations in the process of developing law and policy. And we must be reliable partners.

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In conclusion, I want to acknowledge a debate that is underway here and in other venues: Should we be seeking a Sustainable Development Goal that specifically sets science as a priority? (pause) I would answer with another question: If we agree that science is a crucial factor in the serious challenges facing humanity... if we agree on the vital importance of developing the innovation ecosystem...and if we agree that the SDGs will have a strong influence on donor and funding decisions...

Shouldn't we advocate a clear statement in support of science education for every nation and every community? Shouldn't we advocate "Science for All People"?