

Mr. President, Distinguished Representatives, Ladies and Gentlemen:

I am honored to be asked to address the opening plenary session of the 7th review conference of Biological and Toxin Weapons Convention (BTWC), in particular because it demonstrates the important role that the States Parties see for science and technology (S&T) in the future of the Convention.

The BTWC is the legal embodiment of a powerful international norm against the use of disease as a weapon. As a researcher whose career has been devoted to seeking cures for infectious disease, this has great meaning for me. I also believe this norm provides a powerful connection beyond legal requirements to the fundamental social responsibilities of science in ways that can strengthen the implementation of the Convention in the future.

Before addressing the promise for the BTWC that I believe is offered by the growing attention being given to responsible conduct of science around the world, I want to underscore the enormous promise of science with two examples. My personal research is on immunology of two infectious diseases that afflict man; leprosy, an ancient stigmatizing disease, and tuberculosis, a constant companion in my part of the world. These studies have shown me that the immune system is powerful and can defend us against many infectious organisms and diseases such as cancer. It can be effectively boosted with vaccines. These studies have also revealed that the body's defense is open to subversion by natural agents such as HIV, as well as drugs, chemicals and other environmental factors. Man's health and survival can therefore be jeopardized deliberately by interfering with the immune system.

The tremendous economic growth of my home country, India, is well-known and S&T has been an engine for much of that development. One particularly important sector that has played a role in this is the pharmaceuticals industry. According to UNESCO's *World Science Report 2010*, "industry turnover has grown from a modest US\$300 million in

1980 to about US\$19 billion in 2008. India now ranks third worldwide after the USA and Japan in terms of the volume of production, with a 10% share of the world market.”

Approximately 5,000 manufacturing firms directly employ about 340,000 people. As an example from another area, in 2003 my government created a trilateral partnership with Brazil and South Africa known as IBSA, which has fostered a variety of cooperative S&T activities. The IBSA nanotechnology initiative, for example, is a partnership between the ministries of science and technology of the countries that undertake nanotechnology-based projects in the areas of advanced materials, energy, health and water, and human-capacity building.

We need to celebrate the increasing diffusion of scientific and technical capacity around the world at the same time that we work diligently to prevent its misuse. The scientific community has a role in helping to find the best mix of actions, from formal, legal requirements through norms and standards that govern the conduct of research to reduce potential risks while also enabling continued scientific progress.

In its efforts to engage the scientific community in strengthening the BTWC, the States Parties can draw on an existing culture of responsibility in the scientific community. Certainly that culture needs to be strengthened and expanded and, as I will describe later, important efforts are being made. But we are far from starting from scratch. One important area I want to note but which I will not address is biosafety, the responsibility to protect the health of workers as well as the broader community and environment from harm. As other speakers will make clear, important efforts are under way to improve biosafety around the globe and to use it as a foundation to enhance security as well. It is an important part of the culture of responsibility and its capacity-building elements make it attractive for many countries.

Now let me turn to some brief comments on general ideas of scientific responsibility. Science does not operate in a vacuum. Science has long recognized the

ethical dimensions of scientific conduct, both the specific aspects of appropriate scientific conduct and the universal values such as honesty and openness that underpin science. As the most recent edition of *On Being a Scientist*, the widely used introduction to responsible conduct of research from the U.S. National Academy of Sciences notes:

The standards of science extend beyond responsibilities that are internal to the scientific community. Researchers also have a responsibility to reflect on how their work and the knowledge they are generating might be used in the broader society.

And the recognition of these responsibilities is international, such as the recent Singapore Statement from the 2nd World Conference on Research Integrity in 2010 that “researchers and research institutions should recognize that they have an ethical obligation to weigh societal benefits against risks inherent in their work.”

Another example is a new project being undertaken by the InterAcademy Council (IAC) and IAP—The Global Network of Science Academies to address issues of research integrity and scientific responsibility. IAP is a global network of more than 100 of the world's science academies, launched in 1993. Its primary goal is to help member academies work together to advise citizens and public officials on the scientific aspects of critical global issues. The IAC produces reports on scientific, technological, and health issues related to the great global challenges of our time to provide knowledge and advice to national governments and international organizations. Some of you may be familiar with the IAC's 2010 review of the Intergovernmental Panel on Climate Change. I am the co-chair of the Committee overseeing the new IAP-IAC project, on Science Responsibility and Research Integrity along with Professor Ernst-Ludwig Winnacker of Germany, who is the Secretary General of the Human Frontier Science Program.

In the first phase of the project, IAC and IAP will collaborate in developing a short policy report on research integrity. The report will address research practices and management, the reward structure for scientists, principles of scientific integrity, and

culture. This report is intended to be useful throughout the global science community, including the member academies of IAC and IAP, research institutions, government agencies, research sponsors, professional and scientific unions, and individual scientists. The Sub-Committee preparing this report met last week in Amsterdam, and we aim to complete this first phase during the spring of 2012.

In the second phase, an expanded IAC Expert Committee will develop international educational materials for individual scientists, educators, and institutional managers, addressing principles and guidelines for scientific responsibility, including scientific ethics, integrity, and responsibility for avoiding misuse of science. The products are intended for use throughout the global science community.

The launch of this project reflects the recognition on the part of science academies that we can and should play a leading role in promoting scientific integrity and good behavior. A number of academies are already actively playing such a role in their national and regional contexts. We expect that the IAC-IAP project will contribute to more robust dialogue and the development of needed educational programs and materials at the international level.

With regard to the life sciences and its related disciplines, there has been growing recognition that, while the rapid advances in knowledge and capacity offer great promise for health, the economy, and the environment, there are also potential risks. Particularly in the last decade, scientists and scientific organizations have been responding to the challenges. An example is the Biosecurity Working Group of IAP, about which you will hear more during the NGO statements from my colleague Andrzej Górksi of the Polish Academy of Sciences, who is the chair of the Working Group. In partnership with other international scientific organizations the Working Group has pursued projects that support two particular efforts:

- The first is education and awareness raising in the scientific community about its responsibilities to help mitigate the risks associated with the potential misuse of developments in the life sciences, and
- The other is improving the ability of international scientific organizations to provide advice regarding the implications of ongoing advances in the life sciences.

There are many other examples from national and international scientific organizations and the efforts have been increasing.

I want to note the important role that the BTWC has played in helping to engage the scientific community, particularly through the Intersessional Process. This has included issues that directly affect the conduct of science, such as the meetings in 2005 on codes of conduct and in 2008 on education and oversight. It also included meetings where science and technology have important contributions to make, such as in those in 2009 on disease surveillance and capacity building and in 2010 on responding to alleged use of a biological agents. I am very happy to note that a number of my scientific colleagues are here as part of their national delegations, while more are participating as representatives of NGOs. I know I speak for many of my colleagues when I say that we hope this engagement will continue as States Parties consider a new programme of work for the next 5 years.

I have taken the time to go into detail about these specific activities because I want to bring a message that there is an opportunity to take advantage of the growing international recognition of the importance of promoting responsible conduct of science. For most scientists, broad concerns about the social responsibility of science and scientific ethics will be the best entry point for engagement in the specific concerns of the BTWC. Then more can be done to address particular responsibilities vis-à-vis preventing the misuse of science to cause deliberate harm. The Review Conference is an important opportunity for the States Parties to reinforce and support the essential role

that education and awareness raising will play in enabling the scientific community to meet its responsibilities under the Convention. It is also an opportunity to continue to build the relationships between the BTWC and the scientific community that have developed in the last decade and that will support our mutual goals of ensuring that science is used solely to support human progress.

Thank you again for this opportunity to address you and my good wishes for the success of this important meeting.