UNITED NATIONS COMMISSION ON SCIENCE AND TECHNOLOGY FOR DEVELOPMENT (CSTD), twentieth session
Geneva, 8-12 May 2017

High-level roundtable on "Eradicating poverty in all its forms and dimensions through promoting sustainable development, expanding opportunities and addressing related challenges"

Statement submitted by

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Monday, 8 May 2017

Amb Shava, Secretary General, Zhou
Chair Wang excellencies
distinguished colleague.
Thank you for opportunity

INTRODUCTION

- To witness the transformative power of science and technology in development, we need only to look at the agronomist and 1970 Nobel Prize winner Norman Borlaug and the ensuing "Green Revolution".

- Starting with wheat improvement, Dr. Borlaug had the vision to extend crop breeding and management beyond Mexico, to Asia and Latin America, to transform agricultural production and to teach the world to "feed itself."

- This was a boon for science and technology – and had real impact on people, their health, and their livelihoods.

- ~~That was not the first time that technology has transformed agriculture. In 1900, around 41% of America's labor force worked on a farm; now, the proportion is below 2%. This monumental~~ rapid in U.S. agriculture over the past century productivity growth was achieved almost entirely by the application of technology in the form of farm machinery, fertilizers, and other agrochemicals, along with scientifically improved crops and livestock.

- Today is an amazing time for science, engineering, and technology to meet the great challenges that come with food security.

- New technologies are emerging and converging at the nano, macro, and meta scales. These technologies offer new opportunities to transform how the world feeds itself, from innovative farming and aquaculture practices, to novel seeds, to connecting farmers to information and to each other.

EXAMPLES OF STI FOR FOOD SECURITY

- Let's just look at some technologies that are already changing our world today.

- A mere decade ago, before my second-grader was born, the phone and the computer were two separate systems. Most of us here today take pictures, navigate our cars, check the weather, and communicate from one small handheld device.

- Gene editing, propelled by the advent of CRISPR/Cas, is accelerating our ability to make fish grow to market-size faster, to wipe out disease-carrying mosquito populations, and to eliminate cancer-causing DNA from human cells.

- Machine-learning and artificial intelligence are furthering drug discovery, speeding up disease diagnostics, improving public health and safety, and allowing cars to drive autonomously.

- Advanced computing, the Internet of Things, and big data analytics have come together toward pattern discovery and modeling of everything from climate to transportation.

- These emerging technologies—and others—applied in one sector can find new purposes and be transformed to impact food security.

- In Japan, a farmer's son—who came from the automobile industry—figured out how to use open-source machine-learning and AI tools to more efficiently sort cucumbers: picking out the straight, thick, vividly colored, scratch-free vegetables that command the highest market-price.

- I visited last fall with local innovators and entrepreneurs in Rwanda, such as Zipline — a ~~company that is~~ startup using drones to deliver blood and other lifesaving medical supplies to remote places in a fraction of the time it takes to move them via roads.

- Such technology is being repurposed for seed and bull sperm delivery.

- While in Africa last year, I also visited Kenya and met with entrepreneurs who are using data to make greenhouses more effective.

- Such a marriage of big data and farming practices will be critical to boosting food supply and to connecting practitioners. In New York City, Seattle, Houston, Detroit… enterprising individuals have converted old warehouses to vertical farms that rely on a constant stream of data. These farms are "smart": they use a multitude of real-time inputs, everything from humidity to soil temperature to CO_2 levels, to grow plants quickly and with no waste, or run-off, which is characteristic of traditional farms.

- Interestingly, space technology—systems designed for growing stuff on the moon—inspired one company's approach to vertical farming.

- Another space technology – the satellite – is being combined with local smartphone data to gather information on drought through a program known as SATIDA (Satellite Technologies for Improved Drought Assessment).

- Dutch researchers are exploring how to monitor precipitation levels for better rainfall prediction using data from cell phone signal strength.

- Mobile data collection is being used to reach inaccessible areas for real-time collection, analysis, and dissemination to various end-users in the food supply chain.

- That same phone that is playing music and taking pictures is being used to connect farmers to markets, to improve distribution of food at the best market price.

MULTIPLE STAKEHOLDERS

- In all of these examples, it's not just about the technology—what underpin these examples are the people capable of taking the best science and technology and applying it to food security challenges.

- Harnessing STI for food security will depend on building and utilizing linkages with risk-taking innovators and tapping into diverse talent. Tackling this challenge will require collaboration among all stakeholders – including governments, academia, the private sector, and others.

- In my own country, nearly 200 years ago, the U.S. Government started partnering with land-grant colleges and universities to bring the latest science and modern technologies to farmers and consumers through education, food safety training, and leadership development programs.

- This so-called "Cooperative Extension" has entered the era of information, and educators and researchers are relying more and more on emerging technologies to disseminate knowledge and tools to improve agricultural as well as social and economic conditions.

- This Extension also highlights how different groups need to work together to develop or have access to valuable programs.

- More and more, the private sector will be essential to innovating new technologies and building products that will help meet development goals.

- Although the U.S. Government keeps track of the leading edge of technology, the private sector comprises the actual innovators, setting the pace and leading the discussion on issues of ethics, norms, and standards.

- Within the U.S. Government, the State Department is actively engaged in seeking the latest technology solutions to global challenges.

- To really understand the cutting edge of technology and to make sure our foreign policy leaders have access to it, we need to engage researchers at the forefront of science, engineering, and technology, in both the private sector and academia.

- My position—Science and Technology Adviser to the Secretary—was created in 2000 to do just that: leverage the U.S. science, engineering, and technology enterprise to inform policy.

- To date, we have held fora on technology with the U.S. National Academies of Sciences, Engineering, and Medicine, in order to connect research, development, and discovery generated within the high-tech and private sectors to foreign policy priorities.

- My office tracks emerging S&T trends, such as quantum computing, robotics, synthetic biology, and artificial intelligence—that could have implications for how we solve even the toughest sustainability issues, including food security.

- I have worked over the past year and half to create a network of science & technology advisers to foreign ministries. To date, New Zealand, Japan, the United Kingdom, Senegal, Oman, and Poland have similarly created science advisor positions within their foreign ministries; we continue to look toward other countries to do the same.

- This Network allows for S&T advisers to have foreign counterparts, to share best practices and to update each other on how science, engineering, and technology are impacting and are impacted by foreign policy.

- An important stakeholder in the journey toward food security is the public. We remain sensitive to ensuring that the public has confidence in our oversight.

- So, we need to work together across the government and the research community/private sector to address potential technology-related concerns through enhanced public engagement and dialogue.

- Publics need to be engaged constantly and effectively, to ensure an understanding of the beneficial role of emerging technologies in achieving these goals and improving wellness, security, equality, and prosperity for all.

CONCLUSION

- I hope that I have conveyed the essential contribution of science, technology, and innovation to obtaining a food-secure world by 2030.

with the invitation of Ambassador Shava

- Next week, I, along with Ambassador Macharia Kamau, Kenya's Permanent Representative to the UN, will co-chair the 2017 STI Forum. The Forum will gather multiple stakeholders from academia, the private sector, NGOs, and the public at the UN, to discuss how STI underpins the SDGs, and to allow all of those vested in sustainability to connect, to learn from each other, to showcase the latest in science & technology.

- The ultimate goal of the STI Forum is turning *words* on paper—"no poverty", "zero hunger", "good health and well-being", "gender equality"—into *actions*.

- This is why it's critical that you send senior leaders to venues such as this Forum: so that this body—which has science and technology in its title—benefits from the dialogue among people who have responsibility for S&T.

- I similarly look to the 20th session of the UNCSTD to discover meaningful actions in making progress in food security by promoting sustainable development and expanding opportunities for all communities.