Where STI for SDGs is going?
- From discussion to implementation through transforming STI eco-system:
  Policy, roadmaps and capacity building -

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Conclusion of the 2\textsuperscript{nd} STI for SDGs forum

1. crosscutting potential of STI;
2. importance of capacity building;
3. importance of stakeholder engagement;
4. need to make the business case for private sector investment in innovation for the SDGs;
5. importance of roadmaps for tracking progress;
6. centrality of ICT infrastructure expansion to current development and STI efforts;
7. need to focus on match-making between existing problems and existing solutions; and
8. necessity for the STI Forum to conduct a “horizon-scanning” exercise on the changes happening in the STI field.

Identified by Bill Colglazier, Co-Chair of the TFM 10-Member Group and was reported to High Level Political Forum in July 2017.
Introduction
• This recommendation aims to clarify what contributions Japan should make to the achievement of the Sustainable Development Goals (SDGs) through science, technology and innovation (STI) (“STI for SDGs”) in its future international cooperation.
• STI can contribute to the implementation of the SDGs as a deciding factor for making the best use of the limited resources.

1. Change through Innovation: Global Future Creation through Society 5.0
2. Grasp and Solve: Solution Enabled by Global Data
3. Link across Sectors, Unite across the Globe
4. Foster Human Resources for “STI for SDGs”

Conclusion: Core Message
• STI can contribute to the achievement of the SDGs as a “bridging force” which unites different sectors, countries and regions, thereby opening a path to create a society for the future generation.
• Japan’s diplomacy should vigorously play a leading role in implementing the SDGs across the world through STI with these four actions as the pillars of its initiative.
1. Policy and Strategy
   * redefine the science policy agenda. *robust science advice system.
   * whole of government, society and economy approach.
   * strengthen the policy coherence between sectors. *Increased horizontal coordination and integration of sectoral policies, *economically sustainable and shared value.

2. Road maps and action plans
   * STI road maps and action plans, a particular focus on accelerating progress towards the Goals.
   * stakeholder engagement. *knowledge infrastructure is in place through institutions and ministries. *examples.

3. STI Methodology
   * holistic approaches & strategies.
   * multidisciplinary & integrated approaches including local & traditional knowledge.
   * technology assessment & societal impact, foresight and horizon scanning.

4. Capacity building
Session 5: STI roadmaps incorporating SDGs and their implications for policy and capacity building; Questions for discussion

What is the status of discussions and implementation of national STI roadmaps and plans for SDGs?
What are the lessons learned?
What are current gaps and high priority actions?
What can scientific and engineering communities play?
How to structure and organize a session?

9. Questions for discussion
The discussion will be guided by the following questions:

- What is the status of discussions and implementation of national STI roadmaps and plans for the SDGs? What are the lessons learnt? What are current gaps and high priority actions? What role can scientific and engineering communities play in this regard?
- How to structure and organize a session on this topic during the 2018 STI Forum to facilitate discussion and identification of relevant recommendations? Which speakers do you recommend for the respective session of the Forum?
- What are the concrete recommendations for action by the United Nations system, governments, businesses, scientists, civil society, and others that could result from such a discussion at the 2018 STI Forum? What would be desirable deliverables of the Forum?
Japan’s new STI policy: “Society 5.0”* : “Super Smart Society”

- **Society 5.0**: A society where the various needs of society are finely differentiated and met by providing the necessary products and services in the required amounts to the people who need them when they need them, and in which all the people can receive high-quality services and live a comfortable, vigorous life that makes allowances for their various differences such as age, gender, society, nation.

- **Integration of cyber-physical systems** will transform socio-economic structure: business & gov services, production, healthcare, energy, food, traffic, infrastructure, disaster, finance.

*① hunter–gatherer society, ② agricultural society, ③ industrial society, and ④ information society.*
Japan Business Federation:
“Bridging new national STI Policy (Society 5.0) and global policy/strategy (SDGs)

from hard-ware to service, from components to system, from CSR to Creating Shares Values

Using remote sensing and oceanographic data for monitoring and management of water quality, forests, land degradation, biodiversity, etc.

Resolving climate change issues with the simulation based on the analysis of meteorological and other observation data by using High Performance Computing.

Creating smart cities where convenience, safety and economic efficiency are made compatible.

Building global innovation ecosystems by connecting industries, academic institutions and other related stakeholders.

Building resilient infrastructure and promoting sustainable industrialization by using i-Construction.

Boosting food production by smart agriculture utilizing IoT, AI and Big Data.

Improving nutritional status with smart food by cutting-edge biotechnology.

Developing early warning alert system for the prevention of infectious diseases by combining different types of monitoring data.

Making high quality education affordable for everyone on the earth with e-learning systems utilizing state-of-the-art technologies.

Empowering women with access to education and information through the Internet. Providing women with opportunities for startups by utilizing ICT.

Making electric power supply and demand in a sustainable way by constructing smart grid system.
Framework for “STI for SDGs” based on the concept of Society 5.0

Roadmaps

Info platform

Services and systems

Geographical data, Medical data, Earth observation,

Technologies

3D map, Energy Consumption, Digital photos, GPS, Industrial data

Data base and its utilization

IP management, Interface, Defining data format

Science

International standardization, Rules and guidelines,

Social acceptance, Capacity Building

Policy, International Cooperation

By Dr. M. Nakamura
Roadmap for Society 5.0

An example toward digitized activities in urban cities

By Dr. M. Nakamura
The University of Tokyo shall utilize to the maximum extent possible the Sustainable Development Goals (SDGs), which are congruent with the University’s mission, to set into motion collaborative projects which will contribute to the future of humanity and the planet.

http://www.u-tokyo.ac.jp/adm/fsi/ja/projects.html
How to recover, reconstruct broken society and making it more sustainable, after March 11 2011; Big Earthquake, Tsunami and Fukushima Nuclear Disasters
Recovery and Reconstruction using STI for quality of life and industries in the impacted areas with different context.

- Sharing experiences of recovery and reconstruction
- Match making programs and talents
- Nationwide Network
- Conservation of cultural property
The Japanese population aged 65+ is expected to reach one in three of the total population in 2030. RISTEX is situated to witness the advent of this aging society that is without any precedent in the world. Our aim is to sift through and identify specific social issues, and to implement practical R&D in communities.

- Collaboration of social and natural sciences, with multidisciplinary approach
- Collaboration between practitioners / researchers
- Social experimentation, PDCA cycle

**Overview**

A) To develop innovative community-based research programs seeking solutions to critical problems arising in the aged society, which involve relevant multi-stakeholders such as scientific disciplines, government agencies, industries and citizens.

B) To introduce methodological innovations in research solving problems of the aged society.

C) To create a network of R&D & resource centers for redesigning communities for the aged society.

**Goals**

1. To extend years of being independent
2. To create an environment for aging in place

**Two Priority Issues**

Director: Hiroko Akiyama
Professor, Institute of Gerontology, The University of Tokyo
Japan’s longevity challenge

Japan is the frontrunner of aging societies in terms of longevity and the proportion of the elderly in the population. In 2030, one-third of the population will be older than age 65, and 20% will be older than 75 years. Moreover, 75-year-old seniors in Japan are as physically healthy as those a decade younger, according to a recent government survey. If Japan is to deal effectively with the highly aged society of the future, and benefit from this growing sector of its society, it must come up with a new socially inclusive system for people living into their nineties or more.

Currently, Japan treats the period after retirement at age 65 as the “sunset years” of one’s life, effectively discouraging even healthy retirees from working. This situation challenges Japan’s social security system and the national economy. In 1965, 9.1 persons could support one senior citizen in the social security system. This dependency ratio is now 2.4 persons to one senior, and should decrease to 1.3 to one in 2050. Social security benefits will exceed 100 trillion yen in 2030. With 15% of the work force expected to be lost by then, universities should expand programs that help seniors to improve skills, gain new knowledge, and nurture new interests. Japan also must accommodate a diversity of health and lifestyle issues of the senior community by providing a variety of workplaces and work styles. Employers can capitalize on an individual’s strengths while compensating for weaknesses. Innovative approaches can be devised for the work-sharing of abilities as well as of time. Advances in information technology and robotic technology can address an employer’s concerns about safety and productivity that hamper employment of older workers. For example, telecommuting and biomechanical assistive technology (such as a “smart suit”

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“The next generation of elderly will be healthier and better educated.”
The International Landscape of Science-Policy Interface for SDGs: Building networks and system of systems for global issues

Building networks & system of systems for SDGs

Research funding agencies

Universities

Academies, Scientific societies, ISC (ICSU+ISSC)

Science Forum: AAAS,ESOF,WSF,AGORA

International Organizations: UN,UNESDCO,OECD, WB,UNCTAD,WHO etc

Industries, PPP, ESG Investment, Philanthropy

nation states, S&T advisers

In conclusion, I propose the following three actions;

1. Creating an international task team for detail designs of making roadmaps & plans, and knowledge infrastructure;
   * collecting & sharing experiences/cases/data, analysis/structuring, and designing for implementation with stakeholders.
   * Bridging sectors beyond the boundaries; STI, finance, regulation, ethics, horizon-scanning, local knowledge, social science & humanities, motivation etc.

2. Need more institutional commitment by existing universities, academies, and funding organizations in order to reform STI eco-system for SDGs.

3. Need increasing well-organized side-events and break-out sessions during next STI for SDGs Forum, focusing specified issues; smart cities etc. and role of universities and funding agencies etc.
Thank you very much for your attention

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"DARPA's Approach to Innovation and Its Reflection in Industry"
By Lawrence H. Dubois, *SRI International*.
“STI for SDGs”
Here are examples of STI for SDGs by Japan’s efforts in the past decades; decoupling of economic growth from negative environmental impact. We can transform our society by combination of technological innovation and social innovation.

50 years ago
Industrial area in Kyushu

Present
Tokyo metropolitan area

“OECD Environmental Performance Reviews JAPAN” ; “Japan has made steady progress in addressing a range of traditional environmental problems, notably air emissions, water pollution, and waste management.”
New Funding Mechanism for Sustainable development in developing countries: JST & JICA joint funding program; “SATREPS”: Science and Technology Research Partnership for Sustainable Development

**Japanese Government’s S&T Funding Agency**

**Research proposal**

**In total (since 2008): 101 projects in 43 countries**

**SATREPS Research Areas**
- Environment and Energy
- Bioresources
- Disaster Prevention and Mitigation
- Infectious Diseases Control

**Research Period**: 3-5 years

**Research Funding**
- Approx. 1 million USD / project / year (JST + JICA total)
JST/JICA Joint Program: SATREPS

Extension of SATREPS Local Knowledge to Global

JST and JICS

Solution Based

How to extend local knowledge in each SATREPS project to other areas, and to global scale?

Local

Global

@ To identify customized knowledge and commonized knowledge
@ To extend commonized knowledge
@ To integrate customized knowledge

Customized Research

Analysis Based

Commonization

World Bank