

**Day 3: 1 December 2017 ,
9:30 - 10:45, Session 5 : “STI roadmaps incorporating SDGs
and their implications for policy and capacity building”**

Where STI for SDGs is going ?

**- From discussion to implementation
through transforming STI eco-system :
Policy, roadmaps and capacity building -**

December 1 , 2017

Tateo Arimoto

**Professor, National Graduate Institute for Policy Studies(GRIPS) &
Principal Fellow, Japan Science & Technology Agency(JST)**

Conclusion of the 2nd 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.



Recommendation for the Future STI as a Bridging Force to Provide Solutions for Global Issues: Four Actions of Science & Technology Diplomacy to **Implement the SDGs by the Japan's Ministry of Foreign Affairs , May 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"

Professor T.Kishi,
S&T Adviser to
the Minister for
Foreign Affairs

Advisory Board for
the S&T Diplomacy

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.

Key words from “Background Note” for Session 5 on “STI roadmaps incorporating SDGs and their implications for policy and capacity building”

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?**



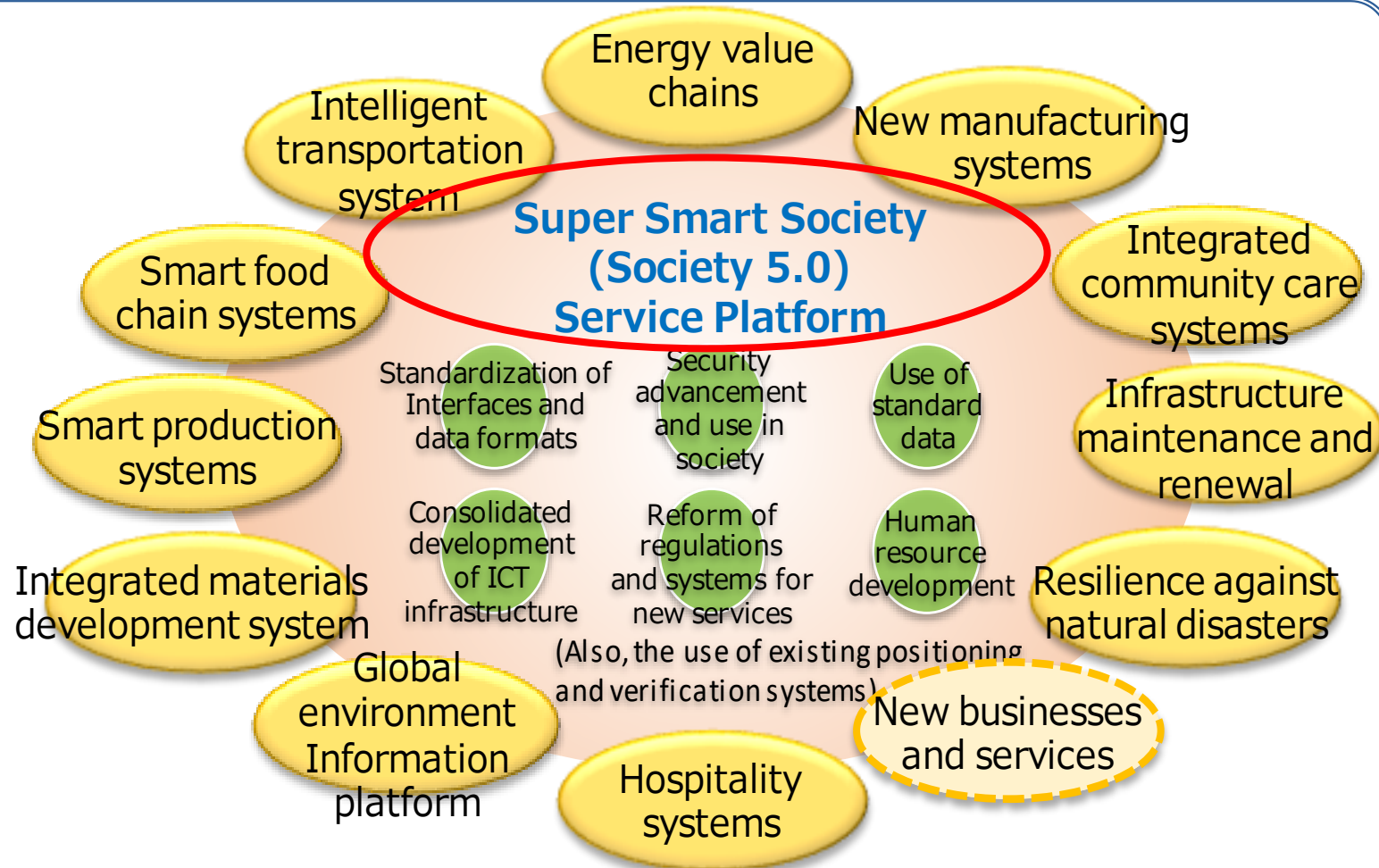
9. Questions for discussion

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.

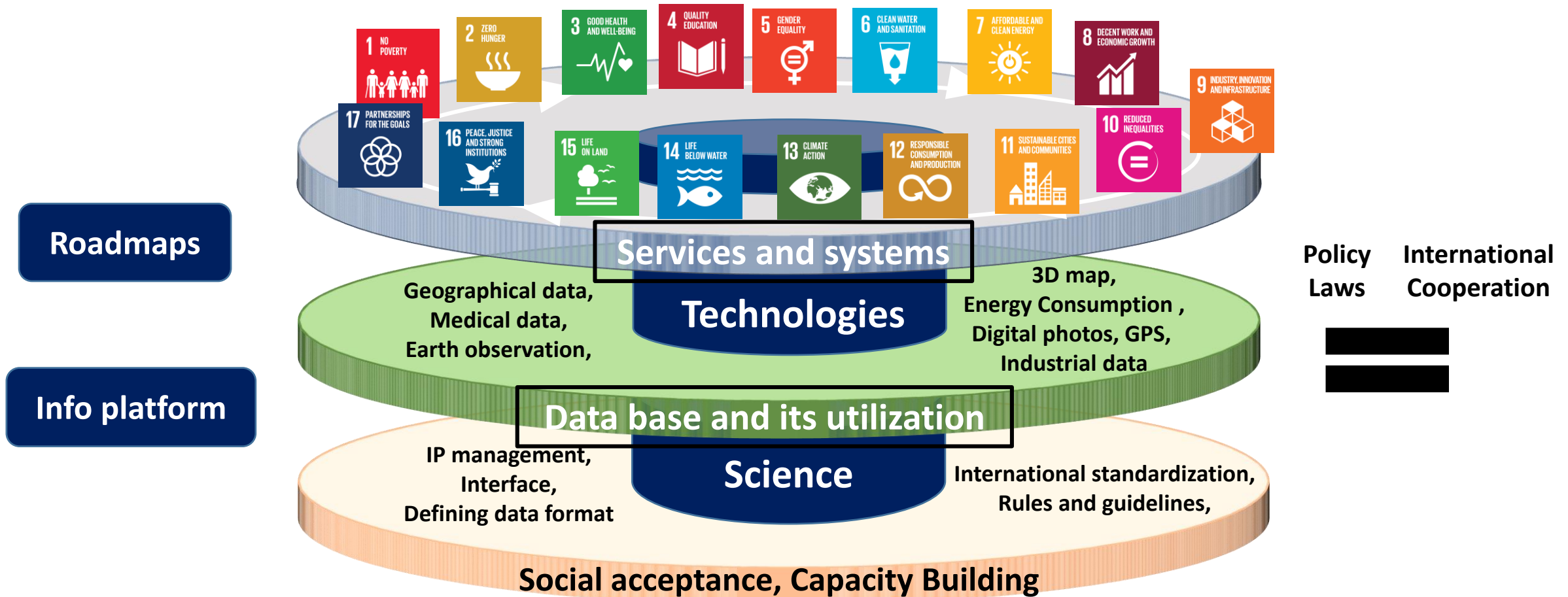
Japan Business Federation :

“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



Framework for “STI for SDGs” based on the concept of Society 5.0

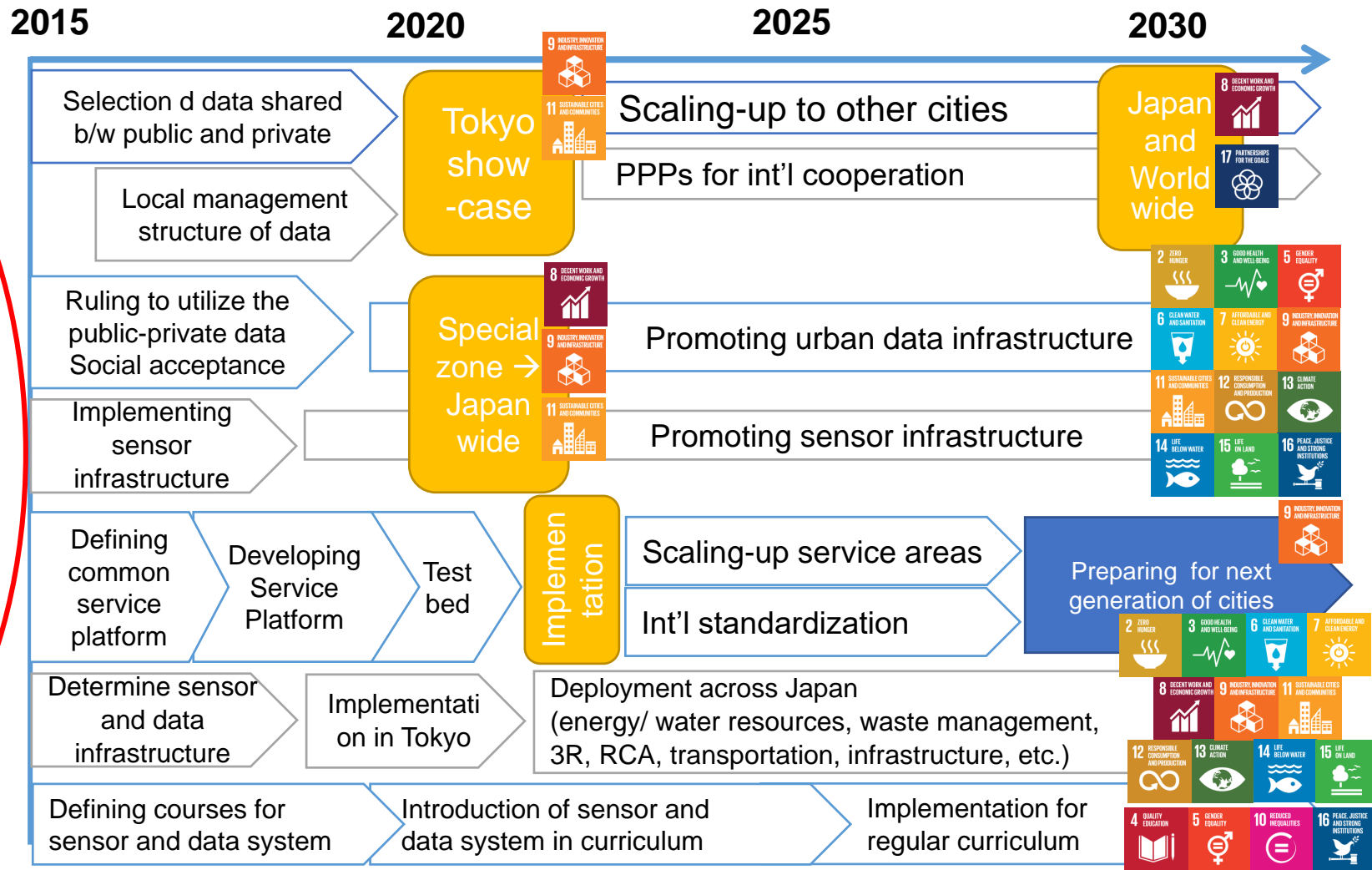
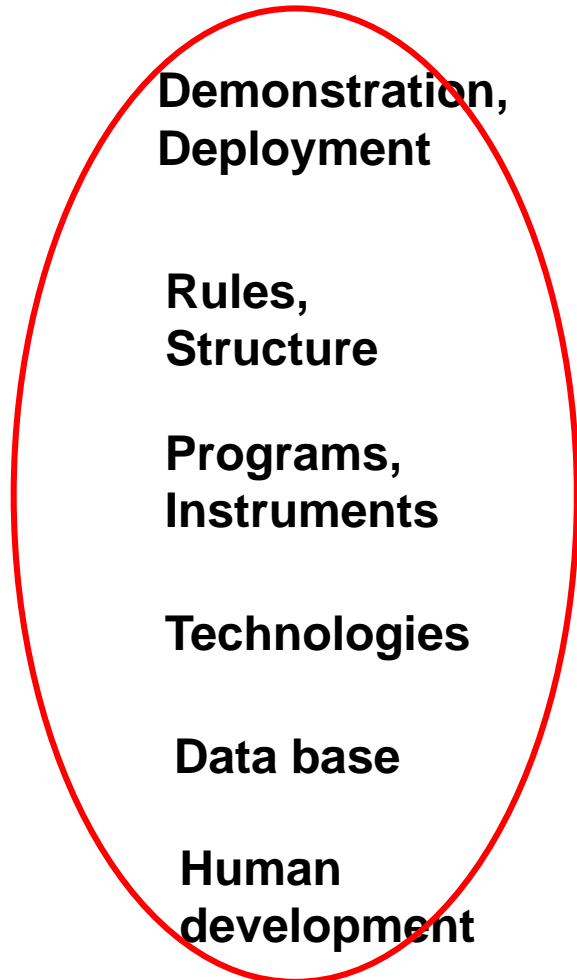


By Dr. M.Nakamura

Roadmap for Society 5.0

Modified by JST, Source from Keidanren

An example toward digitized activities in **urban cities**



“University of Tokyo Future Society Initiative”



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>



スマートコアイランド種子島：地域産業×科学技術×教育の連関で築くプラチナ社会

大久保 達也 総括プロジェクト総務 「プラチナ社会」総括専任講座 代表
菊池 康紀 総括プロジェクト総務 「プラチナ社会」総括専任講座 特任准教授

課題先進国のなかでさらに課題が先進して顕在化している島嶼地域において、地域産業と連携して最先端の科学技術や仕組み、考え方を島外から獲得し、地域の中で実践実験を行うプラットフォームを構築した。このプラットフォームでは、「プラチナ社会」総括専任講座において学際的な社会課題の論議構造の解明と、課題の解決・改善に必要な学理、技術、主体機能の最適化を行うことにより、島外の専門家と島のプレイヤーのマッチングを効率的に進めることが可能となっている。

種子島における社会実験トライアル

「社会協創推進本部」を設置し「社会協創推進本部」を設置し「奉仕する大学」としての使命を



<http://www.u-tokyo.ac.jp/adm/fsi/ja/projects.html>

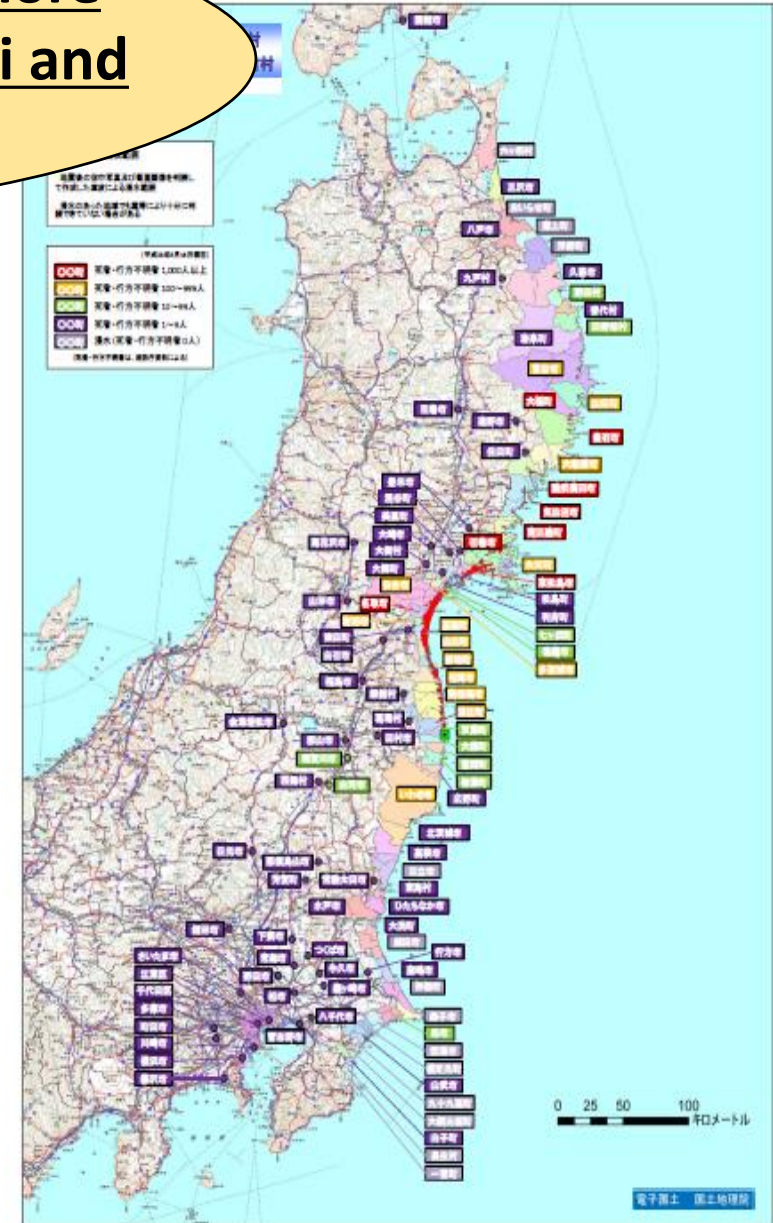
Spatio-temporal analysis on urban development and scenario-based flood risk assessment

高崎 浩之 空間情報科学研究センター 特任助教

USAIDとNASAによる地球観測技術の開発課題への適用を促進するSERVIR Mekongプログラムの助成のもと、メコン川流域の都市域における洪水リスク分析を都市の空間計画に統合する方法を開発する。具体的には衛星データによる都市の土地利用・土地利用マップの結果を、洪水モデルに重ね合わせ、リスクを空間的に明示するツールを開発し、リスク情報を可視化することで、ステークホルダーの意思決定を支援する。2017年7月～2018年3月にタイのバンコク都市圏を対象としたパイロットを実施する。

洪水リスク評価の全体像
credit: 代表者による作成

How to recover, reconstruct broken society and making it more sustainable, after March 11 2011 ; Big Earthquake, Tsunami and Fukushima Nuclear Disasters

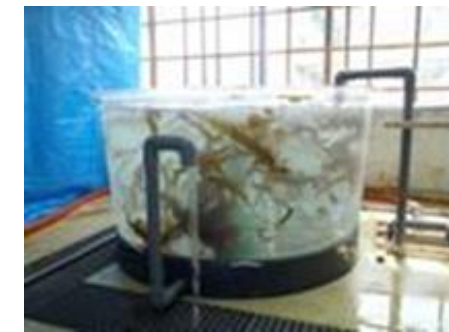
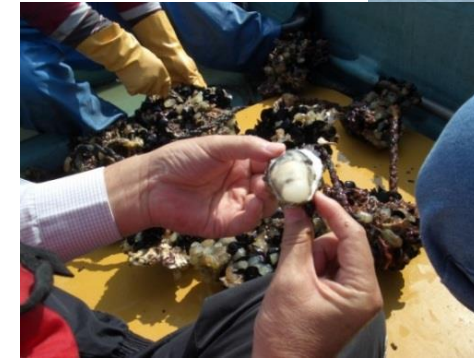
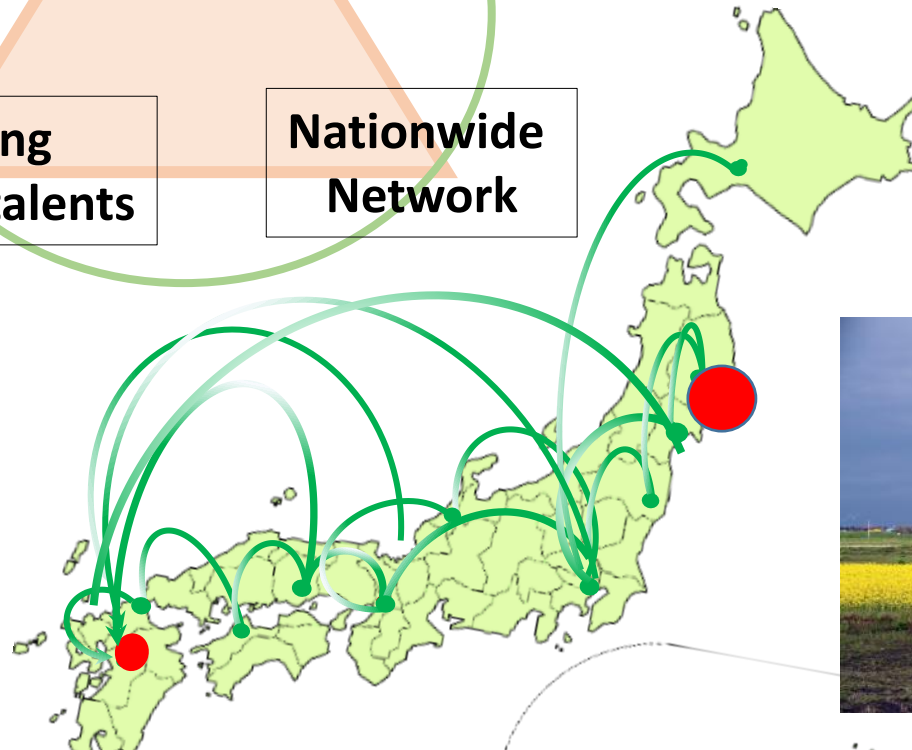


Recovery and Reconstruction using STI for quality of life and industries in the impacted areas with different context

Sharing experiences of recovery and reconstruction

Match making programs and talents

Nationwide Network



Conservation of cultural property



Redesigning Communities for Aged Society

• 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.

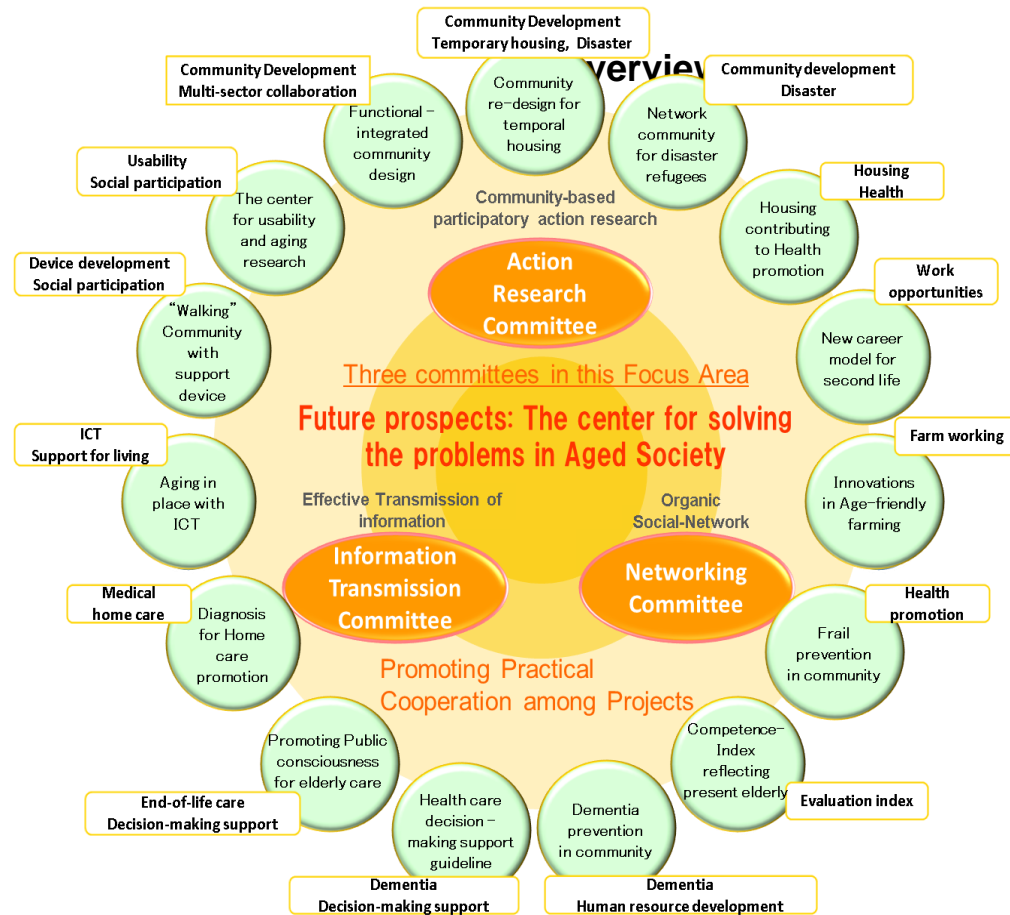
- Collaboration of social and natural sciences, with multidisciplinary approach
- Collaboration between practitioners / researchers
- Social experimentation, PDCA cycle



Director: Hiroko Akiyama
Professor, Institute of Gerontology,
The University of Tokyo

Goals

- 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.
- To introduce methodological innovations in research solving problems of the aged society.
- To create a network of R&D & resource centers for redesigning communities for the aged society.



Two Priority Issues

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



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,

To achieve this healthy life span, maintaining senior quality of life is crucial. New living environments are needed that will allow seniors to “age in place” while nurturing good physical, mental, and social habits that could delay, or even avert, the onset of declining conditions such as frailty and dementia. Lifelong learning will allow seniors not only to maintain their overall well-being, but to integrate into a working society. Here,

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”



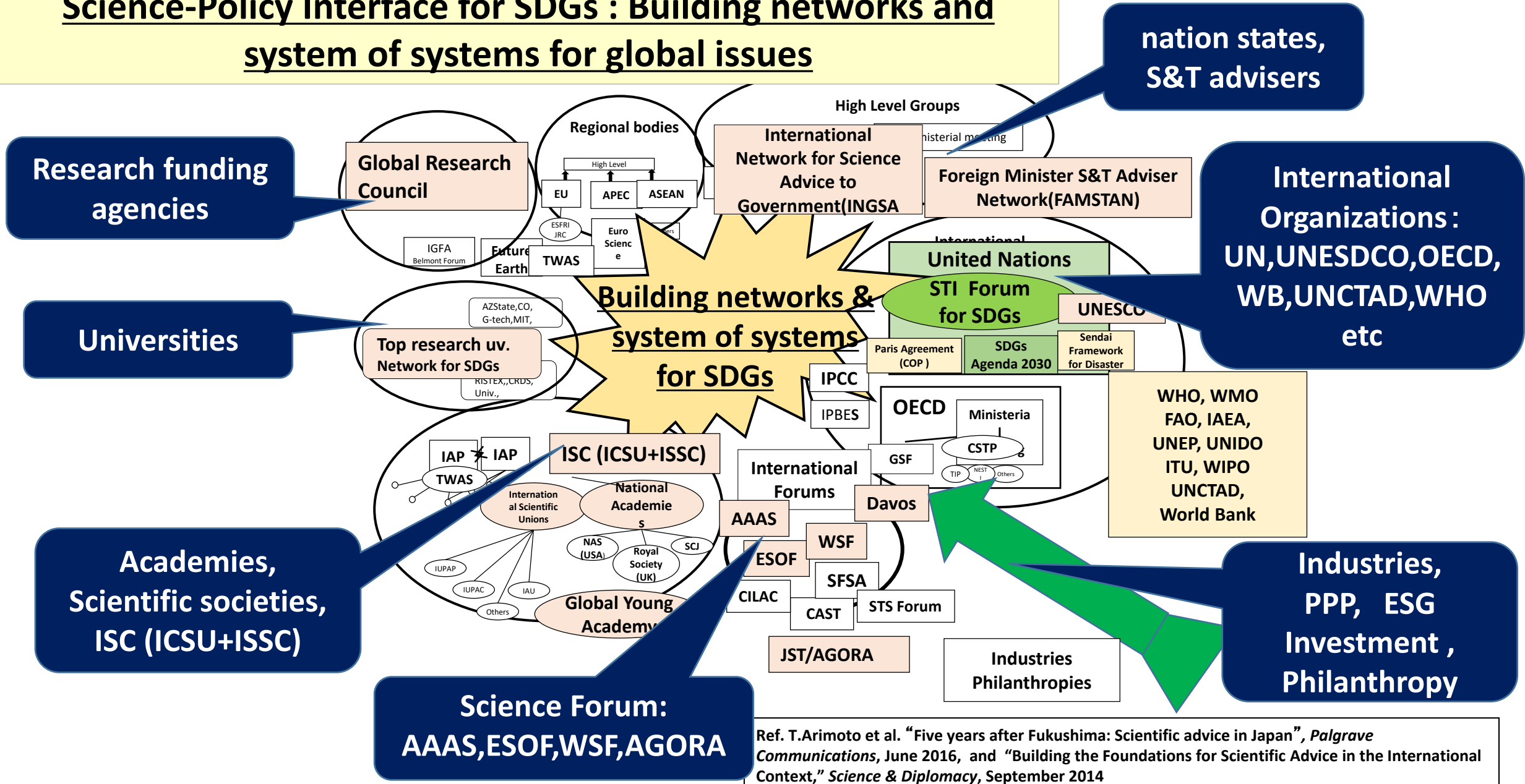
“The next generation of elderly will be healthier and better educated.”



Hiroko Akiyama is a professor at the Institute of Gerontology at the University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo, Japan. E-mail: akiyama@iog.u-tokyo.ac.jp

Science, Dec.4.2015

The International Landscape of Science-Policy Interface for SDGs : Building networks and system of systems for global issues



Ref. T.Arimoto et al. "Five years after Fukushima: Scientific advice in Japan", *Palgrave Communications*, June 2016, and "Building the Foundations for Scientific Advice in the International Context," *Science & Diplomacy*, September 2014

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.**

A scenic landscape featuring a range of mountains under a soft, hazy sky. The foreground shows a valley with mist or low clouds, and the background consists of several layers of mountain ranges, creating a sense of depth. The overall color palette is muted, with blues, greys, and soft pinks.

***Thank you very much
for your attention***

***Tateo Arimoto
t-arimoto@grips.ac.jp
arimoto@jst.go.jp
<http://www.jst.go.jp>
<http://www.grips.ac.jp>***

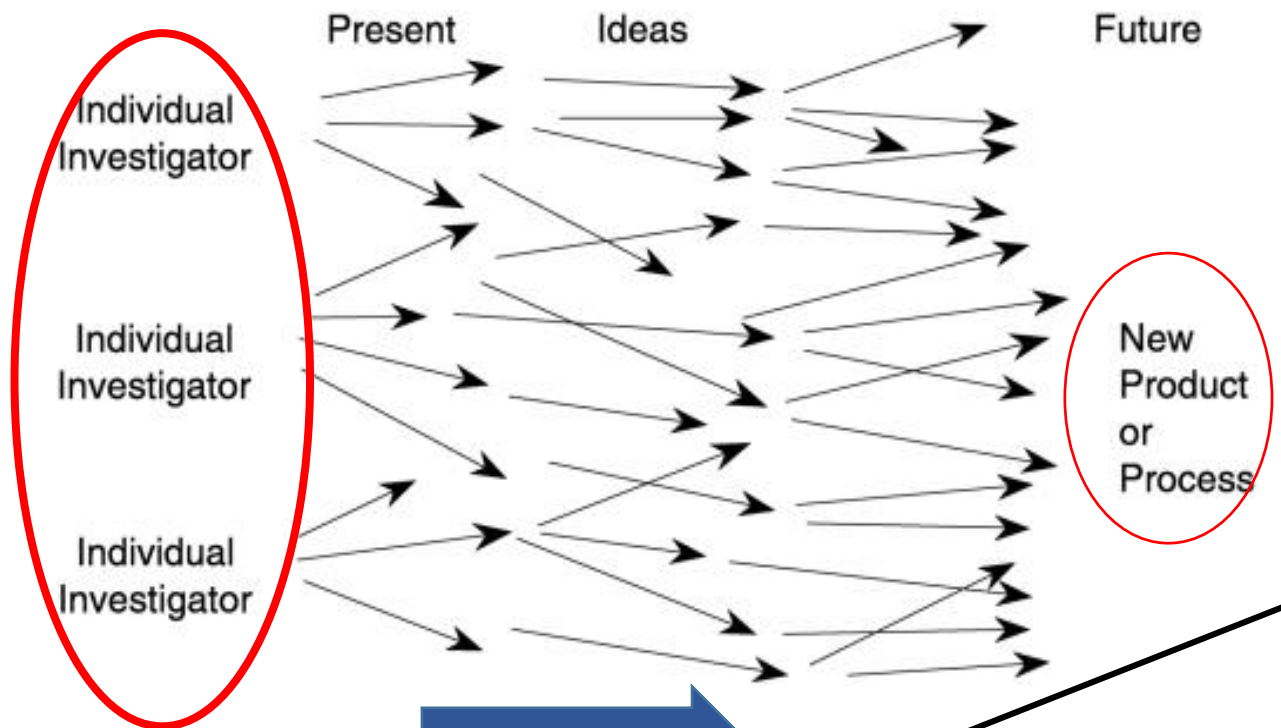
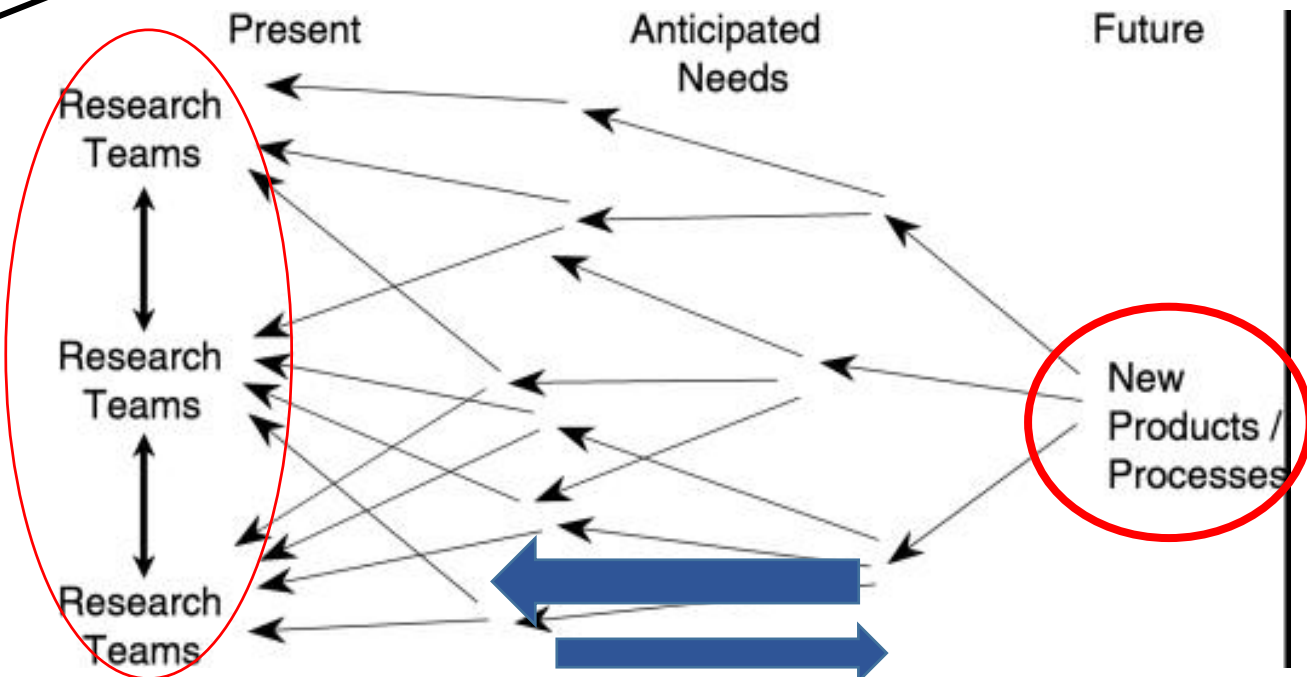


Fig.1. The traditional approach to technology development.



Fig.2. The “end-game” approach to technology development



**“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’ 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



Mt.Fuji

Present

Industrial area in Kyushu



50 years ago

Present

Tokyo metropolitan area



50 years ago

Present

“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

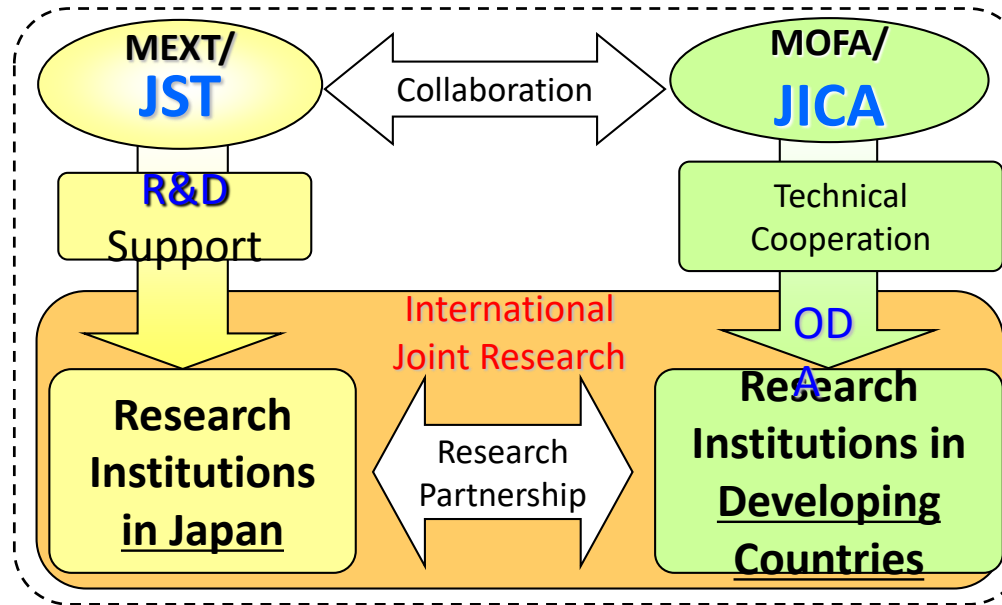
Japanese Government's ODA Agency

Research proposal

ODA request

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

via ministry or agency



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

World Bank

