Recommendation for the Future

STI as a *Bridging Force* to Provide Solutions for Global Issues

Four Actions of Science and Technology Diplomacy to Implement the SDGs

12 May 2017

Advisory Board for the Promotion of Science and Technology Diplomacy

This recommendation is a product of the Advisory Board for Promotion of Science and Technology Diplomacy, chaired by the Science and Technology Advisor to the Minister for Foreign Affairs of Japan.

I. Introduction: Objective of the recommendation and assessment of the current status

【Objective of and background to the recommendation】

International debate has proceeded on the implementation of the Sustainable Development Goals (SDGs) for the period leading to 2030, which were adopted by the United Nations in September 2015 as a guidepost for the direction that the entire world should take[1]. We are now moving into a stage where actions should be taken to achieve the goals. In December 2016, the Government of Japan decided the SDGs Implementation Guiding Principles at the SDGs Promotion Headquarters, which is headed by Prime Minister Shinzo Abe. The Guiding Principles advocate science, technology and innovation (STI) as one of the priority areas and policies.

What contributions should Japan make to the achievement of the SDGs through STI (STI for SDGs) in its future international cooperation? The Advisory Board for the Promotion of Science and Technology Diplomacy has deliberated on this point and has worked out this recommendation in consideration of the government's Guiding Principles.

This recommendation was prepared after discussions held by the Advisory Board for the Promotion of Science and Technology Diplomacy as well as the study group led by one of the Board Members, Mr. Michiharu Nakamura, with additional input of knowledge and experience from other experts and relevant organizations.

【Characteristics of the SDGs and the role to be played by STI】

The SDGs reflect the results of discussions not only on development issues on which attention focused under the Millennium Development Goals (MDGs) but also on agendas shared by all countries, such as the environment and climate change. After rounds of negotiations, the SDGs were formulated to require, in consideration of socially vulnerable people, to solve issues in an integrated manner, with "no one left behind," through initiatives to address a broad range of

[1] In the year 2015 in which the SDGs were adopted, "Sendai Framework for Disaster Risk Reduction 2015-2030" and the Paris Agreement as the international framework on climate change after 2020 were respectively adopted in March and in December. These comprise a multi-layered framework of international cooperation for the international community to tackle global issues together.

economic, social and environmental issues. The SDGs pursue objectives which should sometimes be approached from different angles, such as “development and economic prosperity,” “environmental protection” and “realization of social justice.” As a result, it is pointed out that implementing the SDGs in an integrated manner is not an easy task.

Nevertheless, STI, despite many difficulties it experienced, has played a major role in protecting the people against natural disasters and enriching their lives in the history of humankind. Now, it can contribute to the achievement of the SDGs as a deciding factor for making the best use of the limited resources. That is precisely why the promotion of STI is advocated under Goal 9 (industry, innovation and infrastructure) and why importance is also attached to the use of STI under Goal 17 (means of implementation), which features global partnership for achieving the wide-ranging goals under the SDGs.

Japan, too, during its process of modernization, has had the experience of overcoming its own challenges in such fields as health and medical care, the environment and disaster management by making the most of STI while maintaining social cohesion. Japan’s efforts and achievements in terms of overcoming pollution problems in the postwar period of rapid growth are a typical example of that experience. Concerning international cooperation for developing countries in recent years, Japan has also engaged in international science and technology cooperation in solving issues, including the Science and Technology Research Partnership for Sustainable Development (SATREPS) based on such experience.

Based on such experience, Japan should actively participate in the international community’s efforts to implement the SDGs by taking advantage of STI’s high potential for contributing to the broad range of global agendas covered by the SDGs, including climate change, change in the marine environment, declining biodiversity, food and water resource problems, infectious diseases and natural disasters.

The SDGs have set goals that all countries, from developed to developing countries, should achieve themselves. When engaging in future science and technology cooperation with developed, emerging and developing countries and collaborating through various multilateral frameworks, Japan should contribute to the achievement of the SDGs through STI in cooperation with these states by taking the following four actions.

II. Four Actions to Mobilize "STI for SDGs"

1. Change through Innovation: Global Future Creation through Society 5.0

Technological advance represented by artificial intelligence (AI) and robotics has brought about a change known as "the Fourth Industrial Revolution," as exemplified by the rise of smart solutions making use of IT (ICT) in various industrial sectors including not only manufacturing and services but also agriculture and construction, functioning to support economic growth. Such change has drawn attention in debates in individual countries and also at multilateral fora, including the G7, G20 and the OECD.

The Fourth Industrial Revolution also brings dramatic change to citizens' everyday life through new services and social systems. "Society 5.0"[2], which Japan has set forth as its basic guideline for the science and technology policy for the period leading to 2020 under the 5th Science and Technology Basic Plan, does not merely represent the application of cutting-edge technologies to industry. It represents a vision of a human-centered future society, which achieves advanced integration of real societal space with basic technologies including IoT, big data and artificial intelligence (AI) and which aims to achieve economic development while resolving social challenges at the same time. It is a vision of an ideal society that should be incorporated into individual countries' growth models.

Adapting to social changes by taking advantage of technological advance is a common theme for developed, emerging and developing countries. The idea of "resolving challenges and creating a future through STI" is consistent with the pursuit of achievement of the SDGs through STI. For example, responding to the aging of society is not only a challenge faced by developed countries but is also likely to emerge as a challenge for emerging countries in the not-so-distant future. Therefore, all these countries are pinning hopes on the use of remote medicine and nursing care robots to resolve challenges.

STI could contribute to the achievement of the SDGs while designing a future

[2] Following on from hunting-and-gathering society, agrarian society, industrial society, and information-oriented society, "Society5.0" refers to a new social mode of production in which: (1) by realizing the advanced fusion of cyberspace and physical space, (2) and by providing goods and services that granularly address manifold latent needs regardless of locale, age, sex, language, or any other consideration, to balance economic advancement with the resolution of social problems, (3) to bring about a human-centered society in which people can lead high-quality lives full of comfort and vitality.

society, and it must be developed as something that contributes to that aim. For emerging and developing countries, too, technologies and systems to realize Society 5.0 form the foundation of a future society. The goals and targets of the SDGs indicate various approaches that should be taken in materializing the concept of Society 5.0. In other words, Japan's actions for innovation in cooperation with developing countries with the vision of Society 5.0 in mind will contribute to the achievement of the SDGs. Under this vision, Japan should contribute to the achievement of the SDGs in carrying out its cooperation with other countries.

2. Grasp and Solve: Solution Enabled by Global Data

Advancements of the basic technologies that characterize Society 5.0, such as IoT, big data and artificial intelligence (AI), have enabled processing of massive data on a global scale. As a result, we are witnessing the establishment of observation technology to have "no one left behind" by covering developing countries, remote regions, and oceans where there was not sufficient progress in activities based on observation.

This trend is already reflected in the achievements of SATREPS, which Japan has been implementing since 2008 with the aim of resolving global challenges through joint research with emerging and developing countries. Good examples to solve issues by using observation data include: the wide-area weather forecasting and the development of an early warning system concerning infectious diseases in South Africa[3]; and a system to resolve and cope with water-related disasters in Thailand[4]. What have enabled to provide solutions to a great variety of social and economic issues through such means as model-based climate change forecasting simulations are technologies and systems to gather data through oceanic, satellite and other *in situ* observations and to share, analyze and use such data.

In particular, the advance in satellite and other space technologies that underlies observation and communication activities has made it possible to

[3] This involved the utilization of a high-resolution atmospheric and oceanic model (SINTEX-F) making full use of the Earth Simulator, a Japanese supercomputer (a system to simulate global scale climate change by creating a virtual Earth).

[4] These include deployment of observation equipment in different parts of a country, the establishment of a system to accumulate observation data together with satellite data, and the establishment of a system to integrate observation data into a water resource management model.

obtain high-precision data from around the world with high frequency. Data obtained by constant and timely observations on a global scale reflects people's lives in individual regions and changes in the surrounding environments. Data obtained through various satellite observations, combined with data collected through ground observations, is used to overcome global challenges in such fields as water management, air pollution and forest preservation[5]. Japan has so far played a significant role in the field of earth observation through active participation in international frameworks such as the Group on Earth Observations (GEO).

DIAS, a data infrastructure of Japan, is a big data system capable of storing many sorts of large-scale data including that of satellite observation in an integrated manner, and analyzing and utilizing that data for a variety of purposes[6]. The use of DIAS has enabled and improved highly accurate forecasting of droughts in Asia and Africa. It has also contributed to the formulation of water resource plans based on ODA.

In the field of ocean, too, Japan has delivered results. Marine sciences can contribute not only to Goal 14 (marine resources), which covers many matters for which scientific knowledge is not yet sufficient, such as marine debris and ocean acidification, but also to many other goals, including Goal 2 (hunger) and Goal 13 (climate change). Japan has so far played a major role in international frameworks concerning ocean science, including the Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO), and has contributed to the development of marine scientific research. At the G7 Science and Technology Ministers' Meeting in Tsukuba, Ibaraki in 2016, Japan included the "Future of the Seas and Oceans" as an agenda item and discussed the enhancement of ocean observation and the sharing of observation data with a

[5] These will contribute to the achievement of Goals 11 (sustainable cities) and 15 (land resources).

[6] The Data Integration and Analysis System (DIAS) started from 2006. The goals of DIAS are to collect and store earth observation data; to analyze such data in combination with socioeconomic data, and convert data into information useful for crisis management with respect to global-scale environmental disasters, and other threats; and to make this information available within Japan and overseas.

The prototype of DIAS was developed in 2010. This project established the world's first platform providing scientific information to evaluate the impact of climate change and plan adaption measures in fields such as the water cycle and agriculture, which is based on the diverse and massive integrated data regarding earth observation, climate change prediction, etc. Then, phase II of DIAS from 2011 made further advancement and expansion to apply DIAS as a social and public infrastructure. The current project of phase III has started since 2016 with the aim of its practical operation.

The work of DIAS contributes internationally as well. DIAS is connecting to many data centers from all over the world of Global Earth Observation System of Systems (GEOSS) participating countries.
http://www.diasjp.net/en/about/

view to contributing to Goal 14.[7] Japan can continue to exercise further leadership in establishing international standards for sharing and use of data and monitoring methods and so on.

As described above, activities to share, analyze and use various data obtained through scientific initiatives covering areas ranging from the oceans to space enable objective and sound decision-making (policy decisions) to solve issues in a variety of fields, including health and medical care, disaster management, water and food, energy, the environment and climate change, ocean and biodiversity. Such way of achieving the SDGs based on scientific knowledge cannot be realized by any single country alone. Cooperative actions taken through relevant international frameworks should be promoted further, with attention paid to international open science[8]/open data[9] initiatives, and with the involvement of the private sector, so that the "treasure trove" of observation data can be utilized globally in order to achieve the SDGs.

Concerning Japan's policy on the SDGs in development cooperation, based on the Development Cooperation Charter[10] decided by the cabinet in 2015, a position paper prepared by the Japan International Cooperation Agency (JICA) has outlined the direction that should be taken by Japan, which is to play the central role in 10 goals (Goals 2, 3, 4, 6, 7, 8, 9, 11, 13 and 15)[11] for which Japan can take advantage of its past experiences so far and while aiming for the achievement of other goals as well. It is important for Japan to further promote activities to provide solutions for the SDGs based on global data in its future development cooperation in line with this policy direction while building on the results so far achieved through SATREPS and other programs.

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[7] In consideration of this, support for a science-based approach was also expressed in the G7 Ise-Shima Leaders' Declaration.

[8] The Tsukuba Communique, which was adopted at the G-7 Science and Technology Ministers' Meeting in Tsukuba, Ibaraki in 2016, expressed the ministers' resolve to promote open science and stated: "Fundamental to the progress of open science is the continued investment by governments and others, such as the Group on Earth Observations' Global Earth Observation System of Systems (GEOSS), in suitable infrastructures and services for data collection, analysis, preservation and dissemination."

[9] There is a move led by the International Council for Science (ICSU) to launch a framework for promotion of open data and use of big data in order to prevent emerging and developing countries from being left behind in the use of data.

[10] The Charter focuses on the following priority issues: (1) "quality growth" and poverty eradication through such growth; (2) sharing universal values and realizing a peaceful and secure society; and (3) building a sustainable and resilient international community through efforts to address global challenges, in promoting development cooperation.

[11] The 10 goals are: Goal 2 (hunger); Goal 3 (good health); Goal 4 (education); Goal 6 (clean water and sanitation); Goal 7 (energy); Goal 8 (economic growth and employment); Goal 9 (innovation); Goal 11 (sustainable cities); Goal 13 (climate change; and Goal 15 (land resources).

3. Link across Sectors, Unite across the Globe

【Promoting Linkage across Sectors】

When applying STI to the SDGs, the key is how to create and implement a series of processes from identifying the local needs (challenges), conducting research and development (R&D) in consideration of those needs and then to putting into practice and commercializing (scaling up) the achieved R&D results and the developed systems on a society-wide basis thereby promoting social changes.

To this end, it is important to promote co-design, co-production and co-delivery among different sectors, including various entities that identify and present the needs, scientists and engineers engaging in R&D, companies commercializing the R&D results, administrative organizations responsible for developing the necessary environment, and civil society.

A good example of efforts to connect the real-world needs in Japan and abroad to corporate activities is the SDGs Holistic Innovation Platform (SHIP), a cooperative program between Japan Innovation Network, which is mainly comprised of major Japanese companies, and the UNDP. In Japan's industrial sector, there are also moves to aim for business management that contributes to the sustainable growth of the world by not only positioning the implementation of the SDGs as a corporate social responsibility (CSR) but also "Creating Shared Value (CSV)" through the development of a business model that leads to investment and commercialization intended to implement the SDGs.

In the academic sector as well, there are initiatives like Future Earth that promotes change in science itself by deepening the relationship between science and society. There is also a movement toward the management of university institutions for the "global public", or in other words, for the benefit of the future of the earth and the human society.[12] Moreover, while the use of data alone cannot solve all the issues under STI for SDGs, basic research may provide unexpected solutions in some cases. Therefore, formulation of a framework to

[12] As a background leading to these movements, the "Declaration on Science and the Use of Scientific Knowledge" (also known as the "Budapest Declaration"), adopted by the World Conference on Science on 1 July, 1999, states that "[t]he sciences should be at the service of humanity as a whole, and should contribute to providing everyone with a deeper understanding of nature and society, a better quality of life and a sustainable and healthy environment for present and future generations."

promote participation by leading universities, research institutions and researchers across the boundaries of compartmentalized expert fields has also gained importance.

【Global Unity】

The inclusiveness that "leaves no one behind" is an important element of the SDGs. Therefore, it is necessary to resolve challenges in a manner suited to the specific needs of regions across the world as well as in conformity with the social and cultural background of each region. As Japan promotes its initiatives, it is important to do so through cooperation with developed, emerging and developing countries in consideration of their different positions.

Different approaches are necessary for cooperation with different partner countries. With developed countries, Japan should promote joint research activities making use of each other's advantages in the respective areas of strength. With emerging countries, while promoting their growth, Japan should enhance personnel exchange and cooperation for strengthening "Centers of Excellence" serving as hubs for achieving synergy effects from various cooperation schemes. With developing countries, Japan should provide capacity building assistance and promote research in a manner that takes advantage of the local characteristics of individual countries in the form of support for them to implement the SDGs themselves.

At the same time, when conducting these activities, it is also important to seek cooperation with international development banks (the World Bank, the Asian Development Bank, etc.) and promote the activities through discussions in the United Nations, the OECD and other international organizations and such forums as the G7, G20 and APEC.

In its past development cooperation activities, Japan has enabled the provision of assistance suited to the local circumstances and needs by applying technologies capable of dealing with challenges common to various countries as well as technologies capable of dealing with challenges particular to individual countries. In particular, SATREPS is epoch-making in that it has achieved results by creating a new, globally unprecedented type of funding mechanism by combining ODA with research funds. Japan has also placed emphasis on the aspect of "social implementation," which refers to the activity to disseminate the benefits of joint research throughout society by making them available for

commercialization by private companies. There is a case in which such activity led to cooperation with the Asian Development Bank.[13]

In the field of space, Japan has been promoting cooperation for the development of small satellites by emerging and developing countries, their release from Japan's "KIBO" laboratory of the International Space Station,[14] and joint research with private companies[15] using KIBO. Further forwarding these activities in collaboration with ODA for capacity-building on space utilization[16] will provide strong support for the achievement of the SDGs by contributing to the overcoming of challenges in partner countries and regions.

With all these movements, it has been pointed out that it is important for governments and public organizations to promote cooperation across sectors at a higher level through new public private partnership (PPP) that enables funding organizations at home and abroad, development organizations, public interest groups, non-government organizations (NGOs) and private companies to work together in resolving various challenges under the banner of implementing the SDGs. On the diplomatic front, too, while the implementation of the SDGs is put into action under international frameworks, such as the United Nations, it is important for Japan to promote co-design and co-delivery with a view to promoting new PPP at the global level by linking and uniting diverse actors and regions/countries and by sharing its experiences once again with the world.

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[13] Under the Pilot Study for Carbon Sequestration and Monitoring in Gundih Area, Central Java Province, Indonesia, which was adopted under SATREPS, a joint research team led by Kyoto University and the Bandung Institute of Technology has separated and captured greenhouse gases (CO2) generated in the process of natural gas production at a gas field and has developed technology for safe underground storage of CO2. As a result of a substantial investment made by the Asian Development Bank (ADB), this research is expected to lead to the start of a pilot project jointly undertaken by the Indonesian government and private companies. This is the first carbon capture and storage (CCS) project in Indonesia and is expected to contribute not only to the reduction of greenhouse gases in the country but also to the promotion of the development of clean gas fields and stable supply of energy resources.

[14] DIWATA-1, the first Philippines' satellite that was developed by the Philippines' students accepted by Tohoku University and Hokkaido University as a capacity building assistance measure with support from the universities, was released from KIBO in April 2016.

[15] An experiment to generate protein crystals is being conducted with a drug manufacturer with the aim of developing a new drug. http://iss.jaxa.jp/kiboexp/theme/first/protein/en/index.html

[16] The Project for Disaster and Climate Change Countermeasures Using Earth Observation Satellite, an ODA project, aims to contribute to the improvement of the social and living environments in Vietnam through the introduction of sophisticated disaster management and climate change adaptation technologies by supporting Vietnam, where water and wind disasters due to typhoons and heavy rains frequently occur, in building facilities necessary for the development and use of an earth observation satellite. https://www.jica.go.jp/english/news/press/2011/111102.html https://www.jica.go.jp/english/news/press/2011/pdf/111102_06.pdf

4. Foster Human Resources for "STI for SDGs"

In order to resolve challenges under the SDGs through STI, it is necessary to ensure that technologies and systems take root in individual countries in a manner suited to their respective social and economic situations. Developing human resources is essential to promote and disseminate technologies. Until now, Japan has helped to ensure that technologies and the underlying sciences take root locally by not merely developing facilities and equipment but also training local personnel capable of using and maintaining the technologies.

For example, Japan has provided assistance to Asian and African countries for human resource development and the development and operation of institutes of technology through a consortium of Japanese universities, companies and other entities. Japan has also supported fostering educators in the field of engineering in ASEAN universities/institutes, which in turn would enable ASEAN countries to develop the next generation of their own human resources for research and to extend similar cooperation to less-developed member states in the region[17]. In addition, in recent years, there have been cases in which Japan has been disseminating less invasive medical treatment techniques by providing relevant training for doctors and other medical professionals in Southeast Asian and Latin American countries[18]. In the field of space, Japan also engages in capacity building assistance in emerging and developing countries[19].

We may say that much of such cooperation has a common characteristic of fortifying the sustainability of developing countries themselves, which can be called one of Japan's fortes. Engagement in these activities and participation in international joint research such as SATREPS also benefits Japan by fostering Japanese researchers capable of contributing to the international community from a global perspective.

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[17] ASEAN University Network/Southeast Asia Engineering Education Development Network (AUN/SEED-Net), composed of 26 Member Institutions (MIs) from 10 ASEAN countries, aims at (1) capacity development of academic staff of MIs; (2) academic networking among member universities in ASEAN and Japan; (3) contributing to solving common regional issues; (4) linkage between universities and industry, through graduate degree programs, collaborative research programs and mobility/networking programs.
http://www.seed-net.org/

[18] Under JICA's scheme to promote the dissemination of private-sector technologies for the social and economic development of developing countries, training in laparoscopic surgery was provided in cooperation with Olympus Corporation, leading to the establishment of a training center by the company in Thailand (www.olympus.co.jp/jp/common/pdf/nr160721ttecj.pdf). Another project under the same scheme aims to spread the practice of heart catheter surgery in Mexico in cooperation with Terumo Corporation.

[19] Refer to Footnote 16.

In order to solve issues through STI, it is necessary to make use of cutting-edge science and technology based on sound understanding and acceptance in the political and administrative sphere as well as in the whole society. Therefore, competent communicators responsible for explaining and imparting professional knowledge have a major role to play. From this viewpoint, it is important to promote cooperation with an international network of science advice that has been expanding in recent years among science and technology advisors and other professionals in various countries.

Moreover, in order to foster personnel who support "STI for SDGs" at home and abroad, it is important to ensure diversity, including gender balance. To spread the benefits of research and development widely throughout various members of society thereby responding to the call for inclusiveness under the SDGs, it is essential to have the perspective of inclusive innovation, which incorporates a variety of viewpoints from the research stage.

Japan should enhance the network that connects human resources in Japan and around the world by developing a strong relationship of trust with local researchers and administrative officials. By doing so, Japan should make it a major policy pillar to continue to foster human resources for "STI for SDGs" both at home and abroad, as the foundation of further development of science and technology cooperation in the future.

III. Conclusion: Core Message

While the SDGs have been unanimously adopted by the United Nations as universal goals that should be pursued by all Member States and the momentum has been building toward taking action, the current world is confronted with challenges to and uncertainties over the free and open global model of cooperation that has so far prevailed.

Nonetheless, the challenges under the SDGs are indeed common throughout the world, as is shown by the fact that the deepening problem of inequality even in developed countries lies behind such situation. The solution to those challenges is not division but *partnership*. "STI for SDGs" aims to realize the *peace* and *prosperity* of the *people* and the *planet* by responding to the challenges with the inclusiveness that "leaves no one behind" as the key principle.

STI has the potential to encourage various actors responding to the global

challenges to engage in partnership and co-habitation and to move forward together. STI can act as a "bridge" between different sectors, countries and regions that otherwise tend to be divided, thereby opening a path to create a society for the future generation. In other words, STI can contribute to the achievement of the SDGs as "a bridging force ― the key to unite the world/society to face common challenges for the future."

The key to implementing the SDGs is that countries across the world share this notion and address the challenges together by making use of the potential of STI.

To this end, Japan should take the following specific actions:

- ✧ Present a future vision of *change through innovation*;
- ✧ *Grasp and solve* the challenges by use of scientific data;
- ✧ *Link and unite* across different sectors, regions and states; and
- ✧ *Foster* human resources to undertake efforts of "STI for SDGs"

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.

Advisory Board for the Promotion of Science and Technology Diplomacy

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Mitsuhiko Yamashita	Member of the Board, CPLO, Executive Vice President (Development, Quality), Mitsubishi Motors Corporation (MMC)
Hiroyuki Yoshikawa	Special Counselor to the President, Japan Science and Technology Agency (JST)

(Reference)

The 2nd, 3rd and 4th meetings of the Advisory Board for the Promotion of Science and Technology Diplomacy were held with attendance of Mr. Fumio Kishida, Minister for Foreign Affairs, Mr. Nobuo Kishi, State Minister for Foreign Affairs, Mr. Kentaro Sonoura, State Minister for Foreign Affairs, Mr. Kazutoshi Aikawa, Director-General, Disarmament, Non-Proliferation and Science Department, Mr. Koichi Aiboshi, Director-General for Global Issues and other officials from the Ministry of Foreign Affairs of Japan.
The followings are the participating government ministries and other relevant organizations.

Cabinet Secretariat, Office of Healthcare Policy
Cabinet Office
Science Council of Japan
Ministry of Education, Culture, Sports, Science and Technology (MEXT)
Ministry of Economy, Trade and Industry (METI)
Japan Agency for Medical Research and Development (AMED)
Japan International Cooperation Agency (JICA)
Japan Foundation (JF)
Japan Science and Technology Agency (JST)
Japan Society for the Promotion of Science (JSPS)
National Institute of Advanced Industrial Science and Technology (AIST)
New Energy and Industrial Technology Development Organization (NEDO)

The study group on international cooperation (SDGs) was led by Mr. Michiharu Nakamura (group leader) and the meetings thereof were held under the Advisory Board for the Promotion of Science and Technology Diplomacy. Attendances include the members of the Advisory Board for the Promotion of Science and Technology Diplomacy, the foregoing government ministries/organizations, and the following individuals, observers and relevant organizations.

Satoru Ohtake	Principal Fellow (International Affairs), Japan Science and Technology Agency (JST)
Taikan Oki	Professor, Institute of Industrial Science, The University of Tokyo
Takao Kuramochi	Senior Deputy Director-General, Center for Research and Development Strategy, Japan Science and Technology Agency (JST)
Haruo Takeda	Leader, STI-for-SDGs Project, The Engineering Academy of Japan Corporate Chief Engineer, Hitachi, Ltd. (observer)
Naohiro Nishiguchi	Executive Managing Director, Japan Innovation Network (observer)
Takashi Yoshimura	Director, Industrial Technology Bureau, Keidanren (Japan Business Federation) (observer)

Japan Agency for Marine-Earth Science and Technology (JAMSTEC)
Japan Aerospace Exploration Agency (JAXA)
RIKEN
The University of Tokyo