

Advisory Panel
on Science and Technology Diplomacy

Report

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Table of Contents

Gist of Recommendations

1 Strategic Future Direction of Science and Technology Diplomacy	
(1) Meaning and Purpose of Science and Technology Diplomacy	1
(2) Strategic approach in STD.....	1
(a) Diplomacy for proactive contribution to peace.....	2
(b) Enhancement of economic diplomacy	2
(c) Diplomacy that takes a panoramic perspective of the world map	3
(d) Public diplomacy.....	3
2 Expected direction and actions for STD	
(1) Response to global challenges and use of diplomatic opportunities	5
(2) Reinforcement of cooperation with diplomatically important partner and newly emerging states	7
3 Structural reinforcement and human development for the effective promotion of STD	
(1) Enhancing utilization of scientific knowledge in planning and implementation of diplomatic policy.....	10
(2) Develop human resources for supporting STD	11
(3) Strengthening international information dissemination and network.....	12
Participants List	16

Gist of Recommendations

Responding to global challenges and utilizing diplomatic opportunities

Recommendation 1: Establish a position to ‘take leadership for the solution of global challenges by using science, technology and innovation to achieve desirable international circumstances’ (clearly position science and technology diplomacy (STD) as the new axis of the Japanese diplomacy).

Recommendation 2: Build a mechanism to rapidly identify the ‘next challenges’ of the international community which will be important in the future and for which Japan can readily exercise leadership.

Recommendation 3: In light of the identified issues, set a diplomatic agenda based on scientific evidence, and lead international efforts.

Reinforcement of cooperation with diplomatically important partner and newly emerging states

Recommendation 4: Promote strategic joint research and development with partner countries with high diplomatic importance.

Recommendation 5: Along with promoting overseas activities of Japanese companies, actively support capacity improvement in designing policies on science and technology innovation, and the development of innovative human resources, in emerging economies.

Recommendation 6: Strengthen cooperation with emerging and developing countries through triangular cooperation that utilizes ODA coordinated with third countries or the Science and Technology Research Partnership for Sustainable Development (SATREPS) program, and move ahead with setting up strategic joint projects with emphasis on innovation for emerging economies and ODA graduate countries.

Recommendation 7: Strengthen human resources development cooperation (assistance for engineering universities etc.) and proceed with next-generation network-building.

Recommendation 8: Utilize science and technology human resources personnel in diplomatic activities through private-sector exchanges.

Strengthen the utilization of scientific knowledge in formulating and implementing diplomatic policy

Recommendation 9: Appoint a *science and technology advisor* to the Minister for Foreign Affairs on a trial basis.

Recommendation 10: Build networks in and out of the nation for strengthening coordination with relevant ministries, organizations, academic experts and the industrial community, and formulate a structure for assisting the *science and technology advisor*.

Recommendation 11: Seek to bolster the capacity and number of the personnel at the overseas diplomatic missions in charge of science and technology (including strengthening information-sharing and coordination with headquarters and other missions, and enhancing training opportunities).

Develop human resources for supporting STD

Recommendation 12: Have mid-career and young researchers participate in formulating diplomatic policy (through work at the Ministry of Foreign Affairs, assist the *science and technology advisor*, and by sending them to international organizations).

Strengthening networks and dissemination of information

Recommendation 13: Proactively convey the message that Japan will ‘take leadership for the solution of global challenges by using science, technology and innovation to achieve desirable international circumstances’ to the international community at a high level, including the Prime Minister and the Minister for Foreign Affairs.

Recommendation 14: Strategically target influential science and technology-related organizations while promoting intellectual exchange, and strengthen the STD network.

Recommendation 15: Strengthen dissemination of Japan’s science and technology information abroad by dispatching scientists and pursuing coordination with exhibition facilities at home and abroad (Japan House, for example).

1 Strategic Future Direction of Science and Technology Diplomacy

(1) Meaning and Purpose of Science and Technology Diplomacy

In recent years, the international circumstances surrounding Japan has been rapidly changing. With the rise of emerging states, Japan gains new potential and at the same time faces new factors of uncertainty. In the meantime, Japan as a single country is no longer capable of coping with cross-border challenges such as infectious diseases, climate change and natural disasters, just to name a few.

In the area of science and technology, with the revolutionary advancement of information and communication technology (ICT), research and development is becoming more global and open, and data science and cyber security are gaining more importance, which have been causing drastic change in the methodology in science, technology and innovation.

Taking into consideration the global-scale change in power balance, the ICT revolution, the emergence of cyber society, the divergence of threats and the increase in uncertainty caused by globalization, Japan's diplomacy is required to be more strategic in order to respond to the drastic change in science, technology and innovation by promoting international collaboration.

National Security Strategy of Japan (Cabinet Decision of Japan, December 2013) strikes the importance of the 'strengthening technological capabilities' in the context of national security, quoted as: *Japan's outstanding energy-saving and other environment-related technologies play an important role in Japan's efforts to tackle global issues together with the international community. Therefore, Japan will proactively utilize these technologies in diplomacy as well.*

The importance of the science and technology diplomacy (STD), which combine science and technology with diplomacy, was first focused in a full-fledged manner in *Toward enhancing science and technology diplomacy*, issued in May 2008 by the Council of Science and Technology Policy (CSTP). In February 2010, CSTP's STD Strategy Taskforce summarized the strategy that clarifies challenges and measures for the government to tackle toward 2020.

In the same period of years, to promote STD, for instance, Japan organized the very first G8 Science and Technology Ministerial Meeting; launched a new scheme, the Science and Technology Research Partnership for Sustainable Development (SATREPS) programme; and established an STD Network (STDN). However, bearing in mind the rapid globalization and the drastic change in power balance, Japan needs to engage in STD more strategically and proactively. With limited natural resources and relative decline of science and technology capability brought by its decreasing birthrate and aging population, strategic international collaboration is of particular importance. In this regard, this Advisory Panel highly expects that STD be a major pillar of the Japanese diplomacy.

(2) Strategic approach in STD

In general, there lie in STD two aspects: 'diplomacy for science and technology' and 'science and technology for diplomacy'. In Japan, there has been a certain level of progress in 'diplomacy for science and technology'. On the other hand, there is a room in 'science and technology for diplomacy' for enhancing strategic measures and

building effective structure to implement them.

To promote STD in view of ‘science and technology for diplomacy’, strategic priorities of Japan’s diplomacy needs to be clarified. Japan’s diplomatic strategy has been based on enlightened pursuance of national interest and contribution to peace and prosperity of the international community. Therefore, the Japanese STD can be deemed from both aspects of ‘STD for peace’ and ‘STD for prosperity’.

The benefit of science and technology is by nature shared by all humankind regardless of national borders. Thus the science communities are universal; they are transnational communities based on the common rules and values. Therefore, when science and technology is considered as diplomatic tool, science communities in two different countries, even if they have difficulties in official diplomatic communication, may be able to have a cross-border dialogue through their common language. In developed countries such as the United States, with such nature of science and technology, activities have been taken in Track 2 to promote science and technology cooperation in an effort to build confidence with countries to which dialogue and exchange are difficult through the official diplomatic channel. One of the recent cases is the activities of scientists’ group, taken along with the normalization process of the diplomatic relations between the US and Cuba. Another case is the repeated visits of groups led by high-level US scientists to Pyongyang.

Furthermore, there is recent increase of diplomatic challenges, which require scientific and technological knowledge for their solution. Such expertise is increasingly necessary for making diplomatic policies. This applies in particular to the frontier areas in science and technology such as outer space, the Arctic, deep sea, and cyber space, where major states have started to make rules on governance and are exercising their diplomatic measures. It is urgent to acquire basic information and knowledge for relevant policy-making. Major states turn more to science and technology for recognizing the current state and analyzing prospects of the utilizations of outer space, surveilling the destructive actions to satellites, observing the pace of thawing in the Arctic, mapping the geographic data of the sea floor, and so on.

(a) Diplomacy for proactive contribution to peace

Japan has been making efforts for more proactively contributing to peace and stability in the Asian and Pacific region and the other regions in the international community from the position of *the proactive contribution to peace based on international collaboration*. Japan’s STD can be deemed as a major pillar of *the diplomacy for proactive contribution to peace*. In a more specific way, this means that Japan is contributing to challenges linked to regional and international stability, such as infectious diseases, climate change, energy-saving, disaster risk reduction, and health. Also in the area of disarmament and non-proliferation, Japan can also utilize the state-of-art nuclear technology to take more active initiative to realize the world without nuclear weapon as the only one country that experienced nuclear bombing in the past.

(b) Enhancement of economic diplomacy

One of the three major pillars of Japan’s diplomacy is *the enhancement of*

economic diplomacy that contributes to the revitalization of the Japanese economy. Specifically, bilateral and multilateral science and technology cooperation with the newly emerging states may contribute to facilitate economic growth in both Japan and its counterpart through promoting innovation and utilizing research outcomes in the industry, for instance. Such cooperation also assists Japanese private companies to extend their activities abroad. Bilateral agreements on cooperation in science and technology can also be strategically used for consolidating bilateral relations and partnership. If the network among officials in charge of science, technology and innovation in major overseas diplomatic missions is further intensified to collect and disseminate information, such a network will support the economic diplomacy. In this way, making use of STD will be a more important factor for the enhancement of economic diplomacy.

(c) Diplomacy that takes a panoramic perspective of the world map

National Security Strategy of Japan in 2013 elaborates the necessity for Japan to play more active roles in global perspective as ‘a major player in the international community’. The newly emerging states, not only those in Asia which have been of high importance as neighboring states, but those in other regions as well, have been gaining unique importance. The current Japanese diplomacy takes the strategy of *the diplomacy that takes a panoramic perspective of the world map*. Japan’s STD should be developed likewise globally in a panoramic perspective.

For this sake, Japan needs to collaborate more with allied and partner states to effectively promote STD. In so doing, the parties of collaboration should be prioritized as partner to tackle global challenges.

More precisely, with regard to developed countries, the collaboration should be constructed as partners that have not only scientific and technological excellence but also universal values in common with Japan, such as liberty, democracy, basic human rights, and rule of law, which enable the collaboration to take more effective measures to global challenges. As for the newly emerging states, which enjoy rising economic condition and also higher standard of science and technology, the collaboration with those states should be built to promote mutual economic growth and intensify the bilateral relations. There is still room for utilizing Japan’s advantage in science and technology in the context of development assistance with developing countries. STD should be exercised in an enriched manner by promoting collaboration at various levels.

(d) Public diplomacy

In the international community, Japan has been establishing the image of an advanced country in science and technology. Thus STD can be utilized for overseas public relations and branding the nation by further establishing such a brand image in the world, and therefore it functions as a mode of exerting its ‘soft power’. Japan has been taking steps as a peaceful nation for seventy years after WWII. By linking science and technology to diplomacy, Japan is able to solidify its international brand image of an advanced country in science and technology, which contributes to promoting the public diplomacy.

As argued above, Japan currently needs to exert STD more strategically to contribute proactively to the peace and prosperity of its own and of the international community. The rest of this report will suggest methods by which institutional reinforcement and new measures should be taken for the new development of STD.

2 Expected direction and actions for STD

(1) Response to global challenges and use of diplomatic opportunities

[Background/ Demand for actions]

The international community currently faces a wide variety of cross-border risks, such as those related to the environment/climate change, infectious diseases, energy, foods, water, large-scale disaster, which have taken heavier weight in diplomatic issues. Proactive contribution for the solution of such global challenges is a requirement for Japan to achieve desirable international circumstances as well as to play a suitable role compatible to its presence, as a responsible member in the international community.

For the solution of global challenges, scientific and technological knowledge and expertise is essential in most cases to provide relevant conceptual frameworks to analyze the issues properly and to suggest concrete solutions. Scientific and technological knowledge is more frequently considered as precondition for the discussion in the international fora under the United Nations, G7, G20, OECD and so on. Japan needs to more actively use science and technology, which is the source of its competitiveness, for diplomacy.

The rapid development in science and technology, such as that occurring in ICT, has affected the entire social life, causing a new kind of challenge that the human kind has never experienced. The concept of ‘Internet of Things (IoT)’, in which all the things in various living spheres are connected to the internet, appears to become reality in the near future. There are also some forecasts that the artificial intelligence (AI) will supersede the human beings. Along with these developments, the consideration in view of social and ethical values will be more critical in using and absorbing the advancement of technology. In the current trend toward open science, citizens will be even closer to science and technology research. Setting norms and rules on which research in science and technology is to be conducted and commercialized will be more important as common challenge of humankind, and thus a diplomatic priority for Japan, as advanced country in science and technology.

[Desirable situation]

The status and influence of Japan in the international community will increase if it is to provide beneficial suggestions or ideas of concrete measures to control and reduce the global risk or improve the society by utilizing its capability in science and technology.

In particular the diplomatic impact will be highly significant if Japan can offer tangible contribution to the international community, taking advantage of the occasions in which Japan hosts G7 Summit meetings and Tokyo International Conference on African Development (TICAD) in 2016, and the Olympic and Paralympic Games in 2020.

Moreover, improvement in the domestic standard of science and technology and development in the domestic industry will be possible by committing activities contributing to the solution of global challenges in areas where Japan has advantages and by supporting the Japanese science and technology community to promote overseas activities and build international partnership.

[Analysis of the current state]

Global challenges are discussed not only in the experts' communities, but frequently placed in the agenda of international meetings including those at summit or ministerial levels. To date, when climate change and other items are discussed at diplomatic occasions, experts' knowledge has been to a certain extent incorporated into diplomatic policy-makings, improving the quality of consideration.

However, efforts are yet to be made to specify areas considered as both important to the international community and advantageous to Japan by holistically examining the whole areas of science and technology in view of meaningful contribution to the international community, and to take leadership strategically in such areas through diplomatic occasions.

[Recommendation]

Recommendation 1: Establish a position in diplomacy to 'take leadership for the solution of global challenges by using science, technology and innovation to achieve desirable international circumstances', and clearly deem STD as a new axis of the Japanese diplomacy.

Whereas the Japanese science and technology is highly appreciated internationally, it has not fully utilized its expertise and capability in science and technology; in other words, science and technology has been the *forgotten resources*. The Japanese diplomacy should be more fruitful by utilizing the expertise and capability in science and technology more actively and creatively through taking lead of agenda-setting, solution-finding and rule-making surrounding global challenges, upgrading development cooperation as well as diversifying cross-national channels by means of exchanging science and technology human resources.

When the aforementioned efforts are made, Japan should clarify the position that its STD be based on the value system that honors the liberty of academia and expression and human dignity, and aim at achieving an open, liberal, peaceful and prosperous world. In the trend of open science and the evolution of cyber society, it is urgent to ensure to conduct research in science and technology on appropriate rules, and to prevent the benefit of science, technology and innovation from being used for repressing human dignity. The Japanese STD must uphold the moral high ground and proceed with compassion of the science and technology communities in the world.

In the meantime, the Japanese government may be able to manifest its basic position to 'contribute to the peace and prosperity in the international community through science and technology' by taking advantage of international organizations, while if appropriate supporting the improvement of their functions and facilitating organizational reforms.

Recommendation 2: Build a mechanism to rapidly identify the '*next challenges*' of the international community which will be important in the future and for which Japan can readily exercise leadership.

To effectively exercise STD, a new institutional scheme along with the science and technology advisor (elaborated later) should be established to identify new *next*

challenges by collecting domestic and foreign experts' knowledge in cooperation with the National Institute of Science & Technology Policy (NISTEP), Japan Science and Technology Agency (JST), New Energy and Industrial Technology Development Organization (NEDO) and other related institutions. This new scheme should form a team of members from both areas of science and technology and diplomacy to examine how a variety of risks will come up on horizon from the viewpoint of science and technology, how science and technology changes the international community, to what extent science and technology can be useful for solving global challenges, and how competitive the Japanese science and technology is, while bearing in mind the possibility of disruptive innovation. It will be beneficial to conduct a comprehensive future-prediction study concerning STD, in the manner of the Foresight/ Horizon Scanning, the future-prediction study based on scientific evidence, by the government of the United Kingdom.

Recommendation 3: Consider the identified issues from the viewpoint of experts, and propose to the international community a suitable set of diplomatic agenda that reflect such consideration with scientific evidence to lead discussions at international fora.

In the discussion of agenda-setting, rule-making, and other international negotiations, argument can be made persuasive by supporting it with objective data, cutting-edge knowledge, or technical feasibility that can endure scientific verification at the international level. To take such intellectual leadership, professional diplomats and science and technology talents at the international level should be teamed up to timely compile scientifically and technologically backed ideas with high impact, taking into account schedules of meetings such as the G7 Science and Technology Ministerial Meeting, Committee for Scientific and Technological Policy (CSTP) of the OECD, the Carnegie Group and so on, in order to effectively induce those in inner circles at an early stage. More precisely the science advisor explained below or those who function as a hub will select suitable persons to organize a team to mingle diplomats with science and technology community depending on identified issues.

(2) Reinforcement of cooperation with diplomatically important partner and newly emerging states

[Background/ Demand for actions]

With the increasing political and economic influence of the newly emerging states in the international community, the influence of the advanced states including Japan relatively decreases, causing the dynamic shift to multi-polar system in the world. It is demanded more to reinforce the relations and mutual understanding with diplomatically important partner and newly emerging states, putting into perspective economic diplomacy that contributes to economic growth. Eastern European countries, which became EU member states while eliminated from the recipient list of the official development assistance (ODA), are also in the range of this concept. Such rapidly growing states as newly emerging states tend to attach higher emphasis on science, technology and innovation for the sake of their domestic long-term and sustainable growth. The diplomatic strategy to build relations with these states needs to be shifted

from the deep dependency on ODA to using tools that uses state-of-art science, technology and innovation.

To build confidence with the states or regions that are diplomatically important but difficult in constructing official cooperative relations, it can be useful to have dialogues or exchanges in the area of science and technology on Track 1.5 or 2, that is, with the participation of non-governmental experts in addition to governmental officials. In this regard, collaboration with private companies, foundations, and non-governmental organizations that are conducting STD-related activities should be considered as option.

Attention should also be paid to the strategic dispatching and receiving of foreign students and young researchers. It is necessary to strategically participate in the international flow of brain circulation by promoting such exchange programmes.

[Desirable situation]

In the time of global and open innovation, the cooperation with diplomatically important partner states is desired to be strategically developed in a way to contribute to the promotion of innovation in the domestic community, while putting in the scope the invention of new tools for cooperation.

It is necessary to contribute to the economic development of other countries by facilitating long-term and sustainable growth through the cooperation in science, technology and innovation in a way to build continuous cooperative relations after the future graduation from ODA, and also to support overseas activities of the Japanese companies.

Meanwhile, in relation to states with which dialogue is difficult at the governmental level, exchange in science and technology may enable to build confidence through widening human network, which can make it possible to collect beneficial information in areas in addition to science and technology, such as social and economic situation and relations with other countries.

[Analysis of the current state]

The SATREPS programme, implemented by JST and the Japan International Cooperation Agency (JICA), is highly appreciated as progressive example of STD. In this programme, projects are selected, taking both diplomatic and scientific and technological merits into consideration. Triangular cooperation, in which two countries, usually advanced or relatively developed ones, cooperate each other to provide assistance to a third state, is another possible example of STD. In comparison to ODA-recipient countries, for partner states, with which Japan has allied or similar strategic relations, and ODA graduates (out of the scope of SATREPS), tools for joint-research or exchange programmes reflecting consideration of diplomatic significance are less developed.

Collaboration with the private sector still has room for expansion in SATREPS or other areas in science, technology and innovation.

Furthermore, unlike the United States, no conspicuous activity is recognizable on Track 1.5 or 2, which makes use of the private channel.

[Recommendation]

Recommendation 4: Promote strategic joint research and development with partner countries with high diplomatic importance.

Recommendation 5: Along with promoting overseas activities of Japanese companies, proactively support the improvement of capacity to make policies in science, technology and innovation, and the development of innovative human resources, in newly emerging and developing countries as a means of cooperation with such states, so as to position such cooperation in science, technology and innovation as a new axis of Japan's diplomacy .

In this regard, it should be considered to review the allocation of the financial resource of ODA from the viewpoint of STD.

Methods should also be considered to promote the social installment of the outcomes of SATREPS projects to assist development of human resources for innovation and to intensify collaboration with businesses for these ends .

There are many who finished capacity building programmes at Japanese universities or research institutions and assume high level posts at governmental organizations or institutions in the newly emerging and developing states. Concrete measures should be considered to systematically contact those alumnae of the capacity building programmes and build their network, to utilize such human network for the development of STD.

Recommendation 6: Strengthen cooperation with emerging and developing countries through triangular cooperation that utilizes ODA coordinated with third countries or SATREPS programme, and set up new innovation-oriented strategic joint projects for emerging economies and ODA graduate countries, in particular by specifying target states and developing tailor-made cooperation programmes to those states in science, technology and innovation.

With regard to strengthening cooperation through SATREPS, consideration should be paid to whether projects are selected not only by science merit but also the significance in terms of STD and the impact on the demand of recipients.

Recommendation 7: Strengthen assistance in research cooperation for engineering or other universities in the science and technology related fields in developing/ newly emerging countries, to construct next-generation network based on cooperation in human development.

Recommendation 8: Utilize permanently as resource persons for STD science and technology human resources with the experience of diplomatic practice achieved through the *fellow scheme* elaborated below (see Recommendation 12).

For this sake, it is recommended to assist activities that uphold the implementation of STD in cooperation with the government by providing a framework of human resource network as done by the American Association for the Advancement of Science (AAAS).

3 Structural reinforcement and human development for the effective promotion of STD

For the implementation of STD, the development of human resources engaged in the practice of STD is the most important. It is not easy to find a resource person who has science and technology expertise and is able to practice diplomacy. In the United States as well, discussion was started only recently on what kind of educational input should be provided to the researchers who have interest in diplomacy. On the other hand, it is also possible that the diplomats with the experience of practical diplomacy may learn state-of-art science and technology.

(1) Enhancing utilization of scientific knowledge in planning and implementation of diplomatic policy

[Background/ Demand for actions]

It has become impossible to solve the modern global challenges without knowledge in science and technology. In the United Nations, for instance, the Science Advisory Board, composed of 26 eminent scientists representing all regions and many scientific disciplines relevant for sustainable development, was established in 2014 under the Secretary General to ensure that up-to-date and rigorous science is appropriately reflected in high-level policy discussions within the UN system. There have been an increasing number of international fora for governmental science advisors to discuss common agendas. Japan should participate in these fora to join the argument from an early stage of agenda making .

[Desirable situation]

With the diplomacy uniquely characterized by the use of science and technology, a brand image of advanced science and technology country will be settled to Japan through opportunities such as G7 meetings in 2016 hosted by Japan and the Tokyo Olympic and Paralympic Games in 2020.

[Analysis of the current state]

In the areas of outer space and the Arctic, Japan has been contributing to solving challenges by using science and technology through the monitoring of the earth environment such as observation and scientific researches in land, water and atmospheric areas. Expectation in the international community is high for scientific and technological contribution to solving challenges, such as research on the environmental change in global warming and the Arctic, or international agricultural study for enlarging food production. While it is necessary for Japan to strengthen international contribution through science and technology, its system is not enough developed to incorporate newly gained knowledge through those activities into policy-making. Meanwhile, although SATREPS projects have been implemented widely in the world and highly appreciated by scientists and researchers, they are rarely highlighted in the occasions of Prime Minister's or Ministers' visits to foreign countries, or played up by mass media, which means that branding opportunities are missed.

[Recommendation]

Recommendation 9: Appoint a *science and technology advisor* to the Minister for

Foreign Affairs on a trial basis, to develop institutional schemes for timely input to the minister, by which the information on updated domestic status in science and technology and trend in foreign countries will be well reflected to the policy-making of high-level bilateral and multilateral diplomacy.

Recommendation 10: Under the *science and technology advisor*, construct domestic and overseas networks and gain ideas from them for summit and foreign ministerial meetings and various policy speeches, by which the collaboration with related ministries and agencies, academia and industries will be intensified.

More precisely, supporting systems for the science and technology advisor to the Minister for Foreign Affairs should be developed by establishing an advisory group, comprising of experts in a variety of fields who are familiar with those in domestic and overseas scientists' network, such as vice-presidents of universities or presidents of national research and development institutions, or regular working-level meetings among related ministries. Also the collaboration among think-tank institutions in the field of science and technology should be reinforced so that they can propose suggestions on policy challenges in STD strategies. Moreover, systems should be developed to evaluate the extent to which the science and technology advisor and the supporting systems function.

Recommendation 11: Strengthen the capacities of staff members in charge of science and technology at overseas diplomatic missions by intensifying information sharing and collaboration between the headquarters and overseas missions and enriching training opportunities relevant to science and technology.

Among the diplomatic missions of major advanced countries in Tokyo, many of them hold Japanese local staff members in charge of science and technology in addition to science and technology officials dispatched from home countries, which enables rich human resources in the area. The Japanese overseas missions should be reinforced in terms of the number of staff members as well as their capacity. In this regard, the distribution of science and technology attachés at the overseas missions should be reviewed from the viewpoint of the diplomatic needs in dispatched countries.

(2) Develop human resources for supporting STD

[Background/ Demand for actions]

The implementation of STD takes a form of international research collaboration with other countries, for instance. In this case the real players of the collaboration are researchers and other human resources in science and technology. Whereas diplomatic challenges increasingly demand scientific knowledge, natural science and international studies or politics are not integrated deeply in the Japanese academic field.

However, efforts are being made in the world to build the capacity of players in STD. For example, in the “Neureiter Science Diplomacy Roundtable” organized by AAAS recently, its theme was how diplomacy-related officials and students majoring in international studies or politics should achieve science and technology knowledge. There is also a trend in which seminars on diplomacy/ international relations are organized for young researchers in developing countries.

In the Japanese universities, measures to raise world-class talents such as a Super Global Universities program have been launched and the time has come for the first graduates to appear. From the viewpoint of giving opportunities to these human resources, it is meaningful to provide them with chances to work in the international organizations or to be engaged in diplomatic practice, by which the carrier paths of researchers will be enriched and the capacity of players in STD will be developed in a long term.

[Desirable situation]

The human resources in STD should be diversified, which enables a wider variety of products and activities in science and technology to diplomacy. The supply of such human resources should be enlarged enough to be able to implement activities in both Track 1 and 2.

[Analysis of the current state]

Whereas there are programmes for cultivating world-class capacity at universities, there is no institutional scheme to educate the human resources who have gone through those programmes with national strategy, fundamental perspective regarding diplomacy and security, and statesmanship as researcher.

Due to the recent severe financial condition, it becomes more difficult to create opportunities for Japanese researchers to contribute in international organizations.

[Recommendation]

Recommendation 12: Construct schemes that enable young and mid-carrier researchers to participate in the diplomatic policy-making process.

This recommendation includes in particular (a) to send young and mid-carrier researchers, through a fellowship programme, to divisions in the headquarters of the Ministry of Foreign Affairs or overseas missions that require science and technology wisdom for solving their issues; (b) to serve as assistant to the *science and technology advisor* to the Minister for Foreign Affairs; (c) to widen the chances in international organizations.

Governmental offices and ministries in diplomacy and science and technology should encourage related agencies to create opportunities to disseminate policy recommendations and to discover talents to become the young and mid-carrier researchers engaged in STD, as well as to have the participation in those opportunities counted as steps in their carrier path. The offices and ministries should cooperate to establish such an organization as the AAAS.

(3) Strengthening international information dissemination and network

[Background/ Demand for actions]

Results of international public polls indicate the high level of interest in the Japanese science and technology. Japan's capacity of science and technology is by and large internationally appreciated. By effectively utilizing science, technology and innovation in the area of public diplomacy, the level of interest in and understanding to Japan can be maintained or improved.

In particular, the policy directions recommended above (1) and (2) should be actively disseminated to the international community as ‘new face’ of the Japanese diplomacy, in an effort to improve the soft power of Japan. To take initiative in agenda-setting and rule-making in the international community, it is essential to collect support from a wide variety of people from science and technology community and actors engaged in policy-making processes to the general public, by carefully contacting and interacting them.

[Desirable situation]

Providing solution for global issues through science, technology and innovation can be a form of international contribution that fits to Japan, a country embracing a great volume of excellent human resources and advanced capability in science and technology, which can be an effective measure to manifest its charm and advantage in a way differentiating it from other countries.

In many cases, not only do excellent scientists and researchers play key roles in their special fields, but also have access to high-ranking governmental officials and other influential figures in communities, who have high caliber of announcement to the general public. Strategic enhancement of human network in science and technology can broaden and deepen the base of the Japanese diplomatic capacity.

[Analysis of the current state]

Although the Ministry of Foreign Affairs is implementing the Exchange Programme of Specialists to Promote Science and Technology Diplomacy to dispatch eminent researchers overseas, the use of science and technology in public diplomacy and the development of network in science and technology communities in the world are not necessarily sufficient in comparison to the weight of science and technology in the overall interest in Japan. In the human exchange programmes of the Japan Foundation, natural science areas are less prioritized.

The Ministry of Education, Culture, Sports, Science and Technology (MEXT) and the Japan Society for the Promotion of Science (JSPS) conduct major programmes to dispatch and invite researchers and promote overseas research. Possibilities should be considered to exploit them for public diplomacy in addition to their original purposes. Moreover, it should be considered to formulate networks with scientists to use it for diplomatic purposes, and to use research results for diplomacy in collaboration with international organizations and Japanese companies, for instance.

[Recommendation]

Recommendation 13: Proactively convey the message that ‘Japan will lead finding solutions to global challenges through science, technology and innovation, and realize a favorable international environment’ to the international community.

More concretely, it is desirable that the Prime Minister or the Minister for Foreign Affairs makes a speech on diplomacy focusing on STD at a place carefully selected as suitable to communicate to the public with high impact, for example such an internationally recognized venue as the National Academy of Sciences in the United States, AAAS or the Royal Society in the United Kingdom.

Top government leaders such as the Prime Minister and the Minister for Foreign

Affairs should also actively attend major science and technology meetings held in and out of the country and have a chance to make a speech with high appeal to the public. An international meeting that can be a symbol of the Japanese STD should be organized regularly. High-ranking government officials including ambassadors should actively write to periodicals specialized in science and technology.

Recommendation 14: Promote intellectual exchange and strengthen STD network.

Mutual communication should be vitalized between the science and technology community in and out of the country and diplomacy-related officials. Intellectual exchange in STD should be also actively promoted to facilitate the creation, refinement and outreach of ideas concerning global agendas. In particular, occasions for intellectual exchange and policy dialogues in STD should be made with careful prioritization by strategically targeting major science and technology institutions and foundations. It is desirable to facilitate active participation of researchers belonging to governmental agencies and corporate research institutions in addition to universities. The intellectual exchange programmes of the Japan Foundation should include the element of science and technology in addition to those of arts and culture or in human and social science fields.

Moreover, it is recommended to host an international meeting where important agendas to the Japanese government are incorporated in order to facilitate the exchange between those in domestic and foreign science and technology communities and the Japanese diplomatic circle, and communicate the policy direction of Japan's STD.

In view of influencing the consensus-making in the international meetings such as G7 Science and Technology Ministerial Meetings and CSTP meetings of OECD, intellectual exchange occasions should be made in a timely manner.

Recommendation 15: Strengthen dissemination of Japan's science and technology information abroad by dispatching scientists and pursuing coordination with exhibition facilities at home and abroad (*Japan Houses*, for example).

Products of Japan's STD such as SATREPS should be actively disseminated in occasions that draw attention globally such as at the Davos conference in a manner of acutely communicating key messages.

The Exchange Programme of Specialists to Promote Science and Technology Diplomacy should be reinforced to increase the opportunities for Japanese researchers to outreach the public abroad. In addition to making speeches, it can be an effective idea of enhancing outreach to set Japanese booths at overseas science and technology fora or exhibitions in collaboration with universities and private companies. Moreover, taking as reference the STI Expert Partnership of the US Department of States, a new programme should be considered to offer opportunities for Japanese scientists residing abroad for research to make public speeches or engage in policy dialogues in collaboration with the MEXT and the JSPS. It may be worth considering to encourage overseas public engagement through the citizen science, in which the citizens contribute to scientific development by participating in such activities as collecting observation data.

In addition to overseas diplomatic missions and offices of the Japan Foundation, the *Japan Houses*, planned to be established, should promote the interest in and

understanding to Japan by using the science and technology element. It should be also considered to utilize the National Museum of Emerging Science and Innovation (Miraikan) and other science and technology museums for disseminating information from a diplomatic perspective. Information related to STD should be provided to those engaged in science and technology when they visit Japan to attend international meetings for instance.

Advisory Panel on Science and Technology Diplomacy
Participants List

Chair	Takashi Shiraishi	President, National Graduate Institute for Policy Studies
	Masaru Iwanaga	President, The Japan International Research Center for Agricultural Sciences (JIRCAS)
	Masafumi Kaneko	General Manager/Senior Research Fellow, Center for International and Strategic Studies, PHP Institutes, Inc.
	Atsushi Sunami	Professor, Executive Advisor to the President , National Graduate Institute for Policy Studies
	Mariko Hasegawa	Executive Director, Vice President, The Graduate University for Advanced Studies
	Yuichi Hosoya	Professor, Faculty of Law, Keio University
	Mitsuhiko Yamashita	Member of the Board, Senior Technology Advisor, NISSAN MOTOR Corporation

(Reference)

The meetings of the Panel were held with the attendance from the following organizations and of Yuko Harayama, Executive Member, Council for Science, Technology and Innovation.

Cabinet Office

Science Council of Japan

Ministry of Education, Culture, Sports, Science and Technology (MEXT)

Ministry of Economy, Trade and Industry

Japan International Cooperation Agency (JICA)

The 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)

Task Force on Japan-US Science and Technology Cooperation

From the Ministry of Foreign Affairs, Fumio Kishida, Minister for Foreign Affairs, Seiji Kihara, then Parliamentary Vice-Minister for Foreign Affairs (both attended at the first meeting), Takashi Uto, Parliamentary Vice-Minister for Foreign Affairs (attended at the second, third, fourth and fifth meetings), Takeshi Hikihara, Director-General, Disarmament, Non-Proliferation and Science Department attended.