Section 4 Strategic Promotion of International Activities

With the advent of an age of fierce global competition over "knowledge" of technology and human resources that's come with the worldwide mobilization of personnel, international S&T activities are becoming more important than ever.

For its part, Japan must promote international activities in the strategic S&T fields by contributing to the international community through efforts to tackle global issues and by enhancing collaboration with other Asian countries.

From the viewpoint above, the government, in accordance with the 3rd Basic Plan and the "Strategic Task Force Report on Science and Technology Diplomacy" (compiled by CSTP in February 2010), clarified its strategic vision for international activities and is promoting collaboration with other Asian countries, fostering and scuring of world-class researchers, and making efforts toward international standardization (see Part 2, Chapter 3, Section 3, 4) while striving to cultivate an environment that enhances international activities that support these efforts.

1 Improvement of the Environment for the Enhancement of S&T Diplomacy and International Activities, and the Promotion of Researcher Exchanges

(1) Enhancement of S&T diplomacy

With further advancements in globalization in recent years, it is important to improve Japan's global presence through the promotion of S&T and international cooperation, because global issues that are difficult to solve for a single country have emerged and international intellectual competition has become increasingly fierce. Under these circumstances, it is important for the government to focus on S&T diplomacy, which improves S&T cooperation through diplomacy and generates synergetic effects. MEXT is strategically promoting measures for (1) the enhancement of S&T cooperation with developing countries to solve global issues, (2) the enhancement of S&T cooperation utilizing Japan's advanced S&T, and (3) the enhancement of infrastructure for the promotion of S&T diplomacy. In particular, Japan Science and Technology (JST) is implementing the "Science and Technology Research Partnership for Sustainable Development (SATREPS)" program for the promotion of S&T in cooperation with developing countries from Asia and Africa in order to solve global issues related to such fields as environment/energy, bio-resources, natural disaster prevention, infectious diseases control, through a combination of Japan's excellent S&T and ODA. Thus, the Ministry promotes joint research programs between Japan and developing countries, through cooperation with Ministry of Foreign Affairs (MOFA), and other related organizations.

(2) Promotion of international research activities

It is necessary to attract highly talented personnel and cutting-edge information to Japan and to promote the internationalization of S&T activities in order to respond to challenges facing human beings.

Hence, through the combination of the excellent S&T of "Science and Technology Research Partnership for Sustainable Development (SATREPS)" (by JST/ Japan International Cooperation Agency (JICA)), "the Dispatch of Science and Technology Researchers" (by Japan Society for the Promotion of

Science (JSPS)/JICA), with Japan's ODA, "Asia-Africa Strategic Science and Technology Cooperation Promoting Program" (funded by the Special Coordination Funds for Promoting Science and Technology) and the "Strategic International Cooperative Program" (by JST), the activities of international cooperative research and international conferences are actively being promoted.

Furthermore, JSPS supports exchange between research institutions in countries with advanced science (in Europe and the U.S.) and Asian and African countries, and strives to establish scientific research networks and foster young researchers through "Core-to-Core Program," "Asian CORE Program," "Asia-Africa Science Platform Program," and the "A3 Foresight Program." in order to contribute to the enhancement of international competitiveness of Japan's scientific research and foster researchers via measures for the global development of scientific research activities. In addition, JSPS conducts bilateral exchange programs based on memorandums and agreements with related foreign academic institutes, and disseminates information on scientific trends in Japan through its overseas offices to support the internationalization of Japanese universities.

(3) Promotion of researcher exchanges

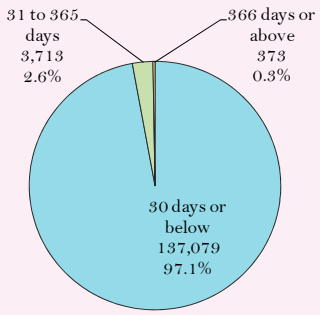
Regarding the exchange of Japanese researchers with overseas institutions, in Part 1, Chapter 1, Section 2.6, we saw that the number of overseas researchers Japan receives as well as the number of Japanese researchers sent abroad have both stayed almost the same for the past ten years at national, public, and private universities, and experimental research institutions in Japan. Of particular note is the number of long-term foreign exchange researchers (stays of more than 30 days), which is less than half that of the peak period (FY 2000) (Figure 1-1-28). In addition, a survey in FY 2009 showed that only 0.3% of overseas researchers stayed at their post for more than one year (Figure 2-3-22). Figure 2-3-23 shows region-classified researcher exchange status, in which the rate of researcher exchange with Asia, Europe, and North America is greater.

There are a variety of opportunities for researchers to exchange with each other at organizational events of universities or research institutions and also in more personal settings. For further development of S&T and scientific research, it is essential for Japan to attract many excellent researchers in and outside Japan and that Japanese researchers compete at cutting-edge levels on the world stage.

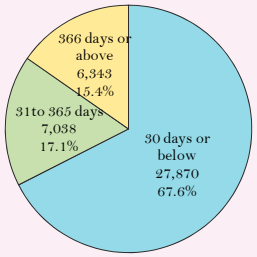
For this purpose, JSPS is implementing various invitational programs designed to coincide with researchers' various career stages and purposes for coming to Japan, such as "Postdoctoral Fellowship for Foreign Researchers" and the "Invitation Fellowship for Research in Japan," in order to support researcher exchange. Thus, JSPS provides excellent foreign researchers with opportunities to engage in research activities at Japanese universities or research institutions. In addition, to enhance international training opportunities for excellent young Japanese researchers, JSPS dispatches young Japanese researchers overseas through the "Postdoctoral Fellowships for Research Abroad," Travel Grant for Attending Lindau Meeting," and "International Training Program (ITP) for Young Researchers" so as to enable young researchers to engage in research at excellent research institutions overseas and expand opportunities for them to interact with foreign researchers. Furthermore, JSPS holds "HOPE Meeting" which provides an opportunity for graduate students to interact with distinguished researchers to foster young researchers in the Asia/Pacific region and build networks among them.

Figure 2-3-22/Researcher Exchange by Period (Dispatched and Accepted)

Dispatched researchers by periods (FY 2009)



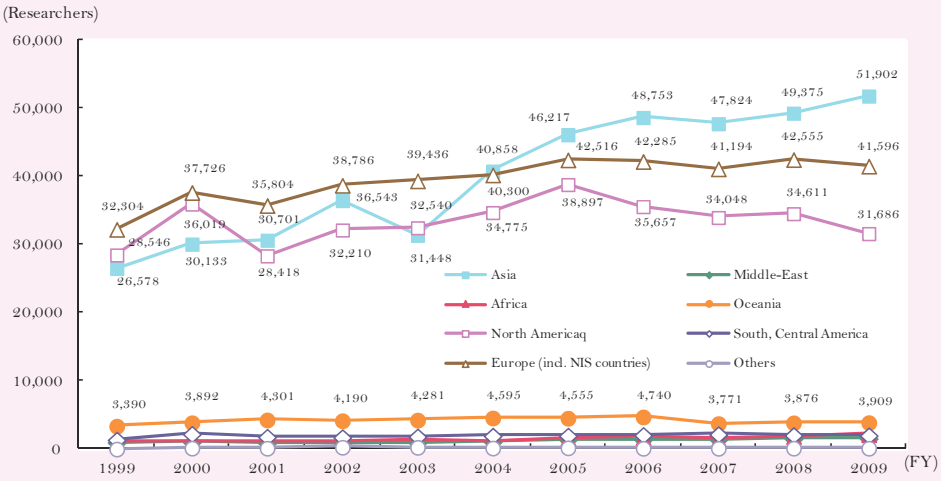
Accepted researchers by period (FY 2009)



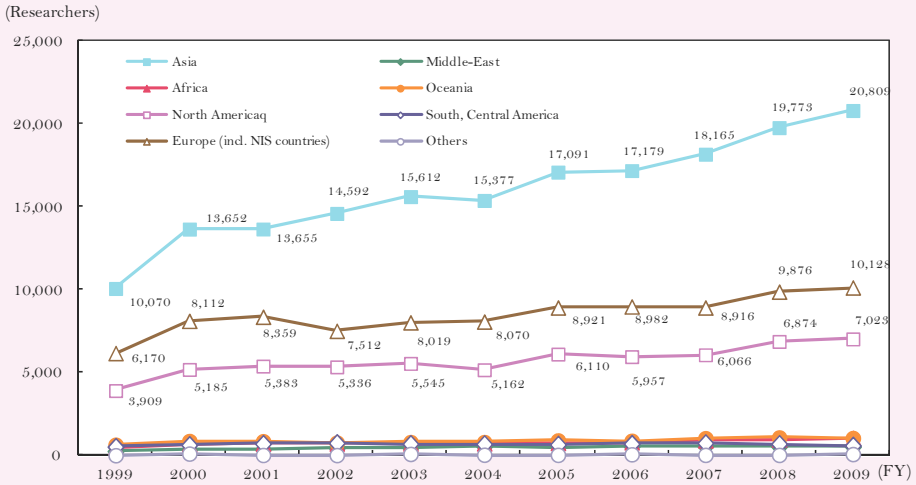
Source: Created by MEXT

Figure 2-3-23/ Trends in Researcher Exchanges at Universities and Experimental Research Institutions, etc.

(1) Trends of Dispatched Researchers by Region



(2) Trends of Accepted Researchers by Region



Source: Created by MEXT

(4) Approaches to international projects

1) International Thermonuclear Experiment Reactor (ITER)

The International Thermonuclear Experiment Reactor (ITER) project is a joint international project that aims to demonstrate the scientific and technological feasibility of fusion energy through the construction and operation of a nuclear fusion experimental reactor. Currently, six countries and one region are participating: Japan, the EU, the U.S., Russia, China, South Korea, and India. [Refer to Part 2, Chapter 2, 5 (1)]

2) International Space Station (ISS)

The International Space Station (ISS) project is an international cooperation project intended to construct manned space facilities in orbit around the earth through the cooperation of five parties (Japan, the U.S., Europe, Canada and Russia). As part of this project, Japan operates and utilizes the Japanese Experiment Module (JEM), also known as "KIBO," and is operating an unmanned cargo transfer spacecraft H-II Transfer Vehicle (HTV), known as "KONOTORI." (Refer to Part 2, Chapter 2, Section 2, 8 [1])

3) Integrated Ocean Drilling Program (IODP)

The Integrated Ocean Drilling Program (IODP), launched in 2003, is an international program led by Japan and the U.S. with 24 participating countries in total. The program aims to help researchers better understand global environmental changes, the structure of the earth's interior, and the deep biosphere in the crust, by using multiple drilling vessels from Japan, the U.S., and Europe. These include Japan's Deep-sea Drilling Vessel "CHIKYU," which is capable of drilling to 7000m below seafloor in deep-sea area, a drill-ship supplied and operated by the U.S. as the program's main drill-vessels, together with "CHIKYU", and Europe's "mission-specific" drilling vessels. (Refer to Part 2, Chapter 2, Section 2, 8 [2])

4) Large Hadron Collider (LHC)

The Large Hadron Collider (LHC) project is being implemented at the European Organization for Nuclear Research (CERN) as a facility to search for and find unknown particles within the enormous energy area produced when protons collide in an enormous circular accelerator, and, by doing so, help scientists explore and better understand the internal structure of substances. The construction of the accelerator was completed in 2008 through international cooperation among countries including the CERN member countries, Japan and the U.S. At present, experimental researchers with the world-highest energy field are conducted. About 200 Japanese researchers are participating in the project, mainly in the ATLAS[1] experiment to search for "Higgs boson" which is considered to be an origin of mass.

2 Cooperation with Countries Abroad

(1) Cooperation with Asian countries

1) East Asia Science & Innovation Area Initiative

By accelerating research exchanges in S&T fields in the East Asia region, the East Asia Science & Innovation Area Initiative aims to enhance R&D capabilities and reach solutions on the environment,

1 A Toroidal LHC Apparatus

disasters, infectious diseases and other common issues in East Asian countries. This Initiative also aims to promote regional innovations by formulating a "community" of science and technology through R&D and utilizing each country's accumulation of knowledge.

To realize the Initiative, the Senior Vice Minister of MEXT made a round of visits to East Asian countries from the end of April 2010 to propose the founding of a joint research fund program through contributions from each country. In May of 2010, at the Japan-China-Korea Summit, an agreement was reached on looking into the possibility of founding the joint research fund program. The Senior Vice Minister of MEXT again proposed the establishment of the joint research fund program at the informal ministerial meeting of Japan-China-Korea on S&T on the same day. As a result of establishment of the joint research fund program, international joint-research projects and human resources development to contribute to the resolution of issues common to East Asian countries are expected.

In October of 2010, at EAS (the East Asia Summit), the Prime Minister proposed the said plan for long-term goals in S&T fields, receiving favorable reactions from several participating countries.

Discussions are planned to continue at meetings in East Asia including the ministerial meetings on S&T, in order to realize the "East Asia Science and Innovation Area" plan.

2) Cooperation with China and South Korea

In May, 2009, the minister of MEXT served as chair for the "2nd Japan-Korea-China Ministerial Meeting on Science and Technology Cooperation" held in Tokyo. Discussions were held, and in order to resolve important global issues and Northeast Asian regional issues, it was agreed to establish the Japanese-Chinese-Korean Cooperative Joint Research Collaboration Program (JRCP) and the "Young Researchers' Workshop." Meanwhile, on the same day, at the Japan-China Ministerial Meeting on Science and Technology Cooperation, a memorandum was signed to reinforce S&T collaboration in the field of earthquake disaster prevention. (In January 2011, the "Strategic International Cooperative Program" started accepting proposals in the field of earthquake disaster prevention. In May 2010, the "Third Japan-China-Korea Committee" was held in Korea and the "Trilateral Cooperation VISION 2020" and the "Joint Statement on Strengthening Science and Innovation Cooperation among South Korea, Japan, and the People's Republic of China" were adopted, while at the same summit, as a side event, the "1st Young Researchers' Workshop" was agreed to be implemented at the "Second Trilateral China-Japan-Korea Ministerial Meeting on Science and Technology Cooperation."

In addition, Japan holds committees on S&T cooperation with China and Korea approximately once every two years, to strengthen both countries' S&T capabilities through bilateral cooperation. In October 2009, the "13th Japan-Korea Science and Technology Cooperation Committee" was held in Korea, and in February, 2011, the "13th Japan-China Science and Technology Cooperation Committee" was held in China. In March 2009, at a meeting between the Japanese Minister of State for Science and Technology Policy and the Korean Minister of Education, Science and Technology, agreements were made to continue policy dialogs between Diet members from CSTP of Japan and the members of the National Science and Technology Council (NSTC) of Korea, with a dialog held in Tokyo, December 2010.

3) Cooperation with Association of South-East Asian Nations (ASEAN)

As part of the activities of the ASEAN Committee on Science and Technology (COST), Japan, China,

South Korea and ASEAN countries, called ASEAN COST+3, are collaborating on this project, of which MEXT is taking leadership on the Japanese side. In December 2010, the Fifth Meeting of ASEAN COST+3 was held in Krabi, Thailand, and opinions were exchanged regarding the joint projects among ASEAN+3 countries. In addition, the Second ASEAN-Japan Cooperation Committee on Science and Technology was held in Vientiane, Laos, in May 2010 to reinforce the collaborative S&T relationships between ASEAN and Japan.

4) Cooperation with Asia-Pacific Economic Cooperation (APEC)

With regard to the S&T field, information exchanges on S&T project implementation and policies for each country are made at the APEC Industrial Science and Technology Working Group (ISTWG). MEXT participates in projects, concerned with S&T human capacity building, etc., under the framework of the ISTWG.

5) Project based cooperation

Since FY 1993, Japan has hosted the Asia-Pacific Regional Space Agency Forum (APRSAF) for the purpose of promoting cooperation on the development and utilization of space technology and has been conducting a variety of cooperative projects from the forum. (Refer to Part 2, Chapter 2, Section 2, 8 [1].)

In addition, accumulation of knowledge and human resource development is carried out to contribute to research of infectious diseases at domestic research centers as well as at overseas centers where emerging and re-emerging infections are predicted to occur.

(2) Cooperation with European countries and the U.S.

Cooperative activities such as holding joint committee meetings based on bilateral agreements on cooperation in science and technology with European countries and North America are actively promoted in the field of advanced research in order to resolve common challenges facing these countries, including those in the life sciences, nanotechnology and materials, environmental sciences, nuclear energy, and space development. Regarding the U.S., in accordance with the Agreement between the government of Japan and the government of the United States of America on Cooperation in Research and Development in Science and Technology, the 11th meeting of the Joint High Level Committee on Science and Technology was held in June 2010. From the Japan side, the Minister of MEXT, concurrently the Minister of State for Science and Technology Policy, attended. In April 2009, the Japan-Sweden Joint Committee on Science and Technology Cooperation was held. In November, the Japan-Germany Committee and the Japan-Norway Committee took place, and in February 2010, the Intergovernmental Consultation on Cooperation in the field of Science and Technology between Japan and the Republic of Hungary was held. In March, the Japan-Russia Committee on Cooperation in Science and Technology took place, and in November, the Joint Committee on Science and Technology Cooperation between Japan and Canada was also held. In addition, in January, 2011, the Japan-Poland Science and Technology Cooperation Conference was held, and in February, 2011, the Joint Committee on Science and Technology Cooperation between Japan and the Netherlands took place.

In addition, there are also joint committees and consultations on S&T with the UK, France, Italy, Finland, Netherlands, Switzerland, Poland, the Czech Republic, etc. based on bilateral agreements on

cooperation in science and technology. (Japan has already concluded international agreements, including bilateral agreements on cooperation in S&T, with 53 countries and institutions around the world.)

(3) Cooperation with African countries

The 2nd Japan-Africa Science and Technology Ministers' Meeting was held in October 2010. It was agreed to put an effort on the cooperation between Japan and Africa in order to contribute to the innovation creation and the solution of regional and global issues.

(4) Cooperation with other countries

In June 2010, an agreement on cooperation in Science and Technology was concluded with Egypt. Meanwhile, collaborations are also underway with a number of countries including Australia, Israel, South Africa, and Brazil, on the implementation of joint research, communication among researchers, and the exchange of information based on S&T cooperation agreements. In the same year, a Committee on cooperation in Science and Technology was held with Israel in August, New Zealand in October, and Brazil in December.

In addition, opinions are currently being exchanged considering the future possibilities for collaboration with other countries with which Japan has not yet concluded agreements on cooperation in science and technology.

3 Systematic Efforts for International Activities

Science and technology create intellectual property that can be shared by mankind and contribute to resolving various global-scale issues. Conducting S&T activities throughout the world is important for Japan to play a proactive role in the international community and to contribute to further development of the country's S&T. Therefore, the government promotes international cooperation within multilateral frameworks, such as OECD, as well as on a bilateral basis in light of the needs of the partner countries and the level of S&T.

(1) The Group of Eight Summit

In June 2010, the G8 Muskoka Summit was held in Canada, and the "G8 Leaders Statement" on development, climate change, and trade and the "G8 Declaration on Counter Terrorism" were agreed upon.

Also in June 2010, the G20 Toronto Summit was held in Canada, with the issues of "World Economy and Framework," "International Finance Organization Reform," "Climate Change," "Import/Export and Investment" being discussed and the leaders' statement agreed upon. The L'Aquila Summit of July 2009 included such issues as "Environment and Climate Change," "Development and Africa," "World Economy" and "Political Issues." With regard to Environment and Climate Change, the goal of achieving at least a 50% reduction of global emission of greenhouse gases by all countries by 2050 was declared to be shared by all attending countries. And at the same time, as a part of the goal, an objective for all developed countries was supported by participating countries to reduce the emission of greenhouse gases by 80% or more by 2050 compared to 1990 levels or those of recent years.

(2) The United Nations (UN)

The United Nations takes measures regarding disaster prevention and earth observation in the S&T field. Japan participates and cooperates to a great extent in a variety of science projects and activities of the United Nations Educational, Scientific, and Cultural Organization (UNESCO), a specialized agency of the UN.

UNESCO is conducting activities to resolve global-scale issues and to establish international rules through such organizations as the Intergovernmental Oceanographic Commission (IOC), the International Hydrological Program (IHP), and the International Bioethics Committee (IBC). Japan is promoting UNESCO activities by implementing human resources development projects of S&T fields in areas such as the Asia-Pacific region and by dispatching experts to commissions to participate in discussions via the contributions to UNESCO trust funds.

(3) Organization for Economic Co-operation and Development (OECD)

OECD works through its Council at Ministerial Level; Committee for Scientific and Technological Policy (CSTP); Committee for Information, Computer and Communications Policy (ICCP); Committee on Industry, Innovation and Entrepreneurship (CIIE); Committee for Agriculture (AGR); Environment Policy Committee (EPOC); Nuclear Energy Agency (NEA); International Energy Agency (IEA); and others to engage in S&T activities, including the exchange of opinions, experiences, information and personnel between participating countries, the preparation of statistical information, and the implementation of joint research.

In May 2010, the Council at Ministerial Level announced the establishment of the OECD "Innovation Strategy" and is promoting efforts across different organizations.

In addition, under the CSTP there are six subgroups: Global Science Forum (GSF), Research Institutions and Human Resources (RIHR), Working Party on Innovation and Technology Policy (TIP), Working Party on Biotechnology (WPB), Working Party on Nanotechnology (WPN), and Working Party of National Experts on Science and Technology Indicators (NESTI). Representative activities of these subgroups under the leadership of Japan are as follows:

1) Global Science Forum (GSF)

GSF was established as a forum for S&T policy makers and scientists to exchange opinions and make recommendations concerning important issues in the S&T sector that require international cooperation and concerted action. Discussions are being held on subjects that are of concern throughout the world, including investigations related to international S&T collaboration with developing countries on global issues and the formulation of road maps of large research infrastructures.

2) Working Party on Innovation and Technology Policy (TIP)

TIP is discussing policies related to innovation and technologies to enhance productivity, to promote creation and utilization of knowledge, to cultivate sustainable growth, and to promote creation of employment for highly skilled technicians.

In 2010, it conducted discussions and case studies on OECD green growth strategy, compatibility of innovation and R&D with globalization, etc.

3) Working Party of National Experts on Science and Technology Indicators (NESTI)

NESTI was established mainly to conduct adjustments and provide advice concerning S&T-related statistics provided to CSTP. It sponsors discussions and examination regarding frameworks for international comparison, investigation methods, and the development of S&T indexes such as those concerning research expenses and human resources. Japan delegates the experts to the OECD office and they are working on development of new indicators. In FY 2010, NESTI conducted discussions on themes and methods of research analysis based on "innovation strategies" in order for NESTI to report the results to CSTP.

(4) Human Frontier Science Program (HFSP)

HFSP is an international joint research fund, which was proposed by Japan at the Venice Summit in June 1987 with the aim of supporting basic international joint research to resolve the complex mechanisms of living organisms. HFSP is now supported by a total of 14 countries, a group comprised of Japan, the U.S., France, Germany, the EU, the UK, Switzerland, Canada, Italy, Australia, South Korea, New Zealand, India, and Norway. The Program provides research grants as research expenses to international joint research teams and fellowships as travel, living and other expenses to young researchers conducting research abroad. In addition, the program organizes HFSP awardees' meetings. With a total of 16 HFSP research grant awardees having received the Nobel Prize up to FY 2010, the program has been highly acclaimed worldwide. Japan has been an active supporter of the program since its establishment.

(5) International Science and Technology Center (ISTC)

In March 1994, four countries and regions, Japan, the U.S., the EU, and Russia, established ISTC in order to provide opportunities of peacekeeping activities to researchers who had been engaged in the development of weapons of mass destruction in the former Soviet Union (FSU) and to support their move to a market economy. As of January 2010, the total amount of the support funds earmarked for approved projects totaled about 836.5 million U.S. dollars, and the number of participating researchers stood at more than 73 thousand. Sixteen years have passed since its establishment and discussions on the role and significance of ISTC are being held to determine the necessity of its reformation.

(6) International activities conducted by the Science Council of Japan (SCJ)

On behalf of Japan, SCJ participates in 45 international scientific organizations, including the International Council for Science (ICSU[1]) and the Inter Academy Panel on International Issues (IAP[2]). SCJ strives for cooperation with various countries by actively taking part in international academic cooperative projects.

Science councils of each country are involved in a joint statement that provides opinions from the scientific viewpoint relevant to the annual G8 Summit's agenda. In June 2010, SCJ announced the joint statement "Health of Women and Children" and "Innovation for Development" in cooperation with the science councils of G8 nations prior to the G8 Summit in Muskoka, Canada. In Japan, the president of SCJ delivered the statement to the Prime Minister. In 2011, G8 Academies Meeting towards the Deauville Summit in May was held from March 24-25, 2011, in Paris, France. SCJ also holds international symposia every year to solve global issues with researchers from a wide range of fields from all over the world. In 2010, the "International Conference on Science and Technology for Sustainability 2010" was held in Kanazawa City, Ishikawa Prefecture, with the theme "Conservation and Sustainable Use of Biodiversity".

In addition, in June 2010, the 10th Conference of the Science Council of Asia (SCA), which is comprised of science councils of 11 Asian countries to promote partnership and collaboration between Asian countries in the field of academic research, was held in the Philippines with the main theme of "Responding to Local Health Issues in Asian countries bordering Pacific Ocean: By Integrated Multidisciplinary Approach in S&T [literal translation]." Many members of SCJ participated.

(7) Other systematic efforts for international activities

The Cabinet Office held the S&T Ministers' meeting in October 2010 with the participation of representatives from 31 countries. They discussed "International Cooperation in Science and Technology Innovation" while actively conducting bilateral policy dialogues.

1 Established in 1931 as a non-governmental and non-profitable international academic institution aiming for promotion of international activities in science and applied fields thereof for the benefit of mankind.

2 IAP- the global network of science academies: Established in 1995 as a forum of the world science academy. SCJ assumed the position of the executive committee member from 2006 to 2009.