

## Section 2 System Reform to Overcome Critical Problems

### 1 System Reform to Promote Problem-solving Based R&D

In order to effectively and efficiently promote problem-solving based R&D, it is necessary to comprehensively and systematically promote efforts such as R&D by coordinating and cooperating with each other and by soliciting broad participation from industry, academia and government. Thus, the government aggressively promotes the efforts stated in Part 2, Chapter 2, Section 4.

### 2 Establishment of a System to Promote R&D Led by the Government

In Japan, regarding the promotion of 1) the critical technology related to national security and 2) the R&D of platform facilities and equipment that are shared by multiple organizations and in multiple areas, a system to conduct R&D shall be established by combining all resources from related research institutions in industry, academia and government, and the government shall take the lead because these activities should be continuously taken over long-term. Thus, a new project shall be created to promote the effective and efficient implementation of such R&D.

## Section 3 Strategic Development of International Activities

In order for Japan to further develop S&T while playing a vital role in the international community, it is important to strategically develop its international activities that are integrated with the world and to promote “S&T Diplomacy.”

For this reason, in accordance with the 4<sup>th</sup> Basic Plan, which includes the “Interim Report on Strategies to Revitalize Japan” (Cabinet decision in August 2011) and the “Strategy for Rebirth of Japan” (Cabinet decision in December 2011), the government is making efforts to contribute to the solution of global-scale issues, to promote strategic international cooperation in advanced S&T fields, to enhance international networks of human resources and research, and to promote improvement of environment in order to support these efforts which strengthen international activities.

### 1 Promotion of R&D Aimed at Solving Common Issues across Asian

In order for Japan to play a leading role in solving global-scale issues and to maintain a strong position in the world, it is necessary to strategically promote science, technology and innovation (STI) policies through international cooperation. Particularly in Asian countries, there are many issues that Japan can tackle by using its S&T capabilities, such as issues regarding the environment, energy, food, water, disasters and infectious diseases. Japan is required to play a vital role in solving these problems, which are common to Asian countries, and to establish relationships of mutual trust and mutual benefit within this region.

For this purpose, the government is working on the establishment of the “East Asia Science and Innovation Area Initiative” to enhance S&T capabilities in cooperation with Asian countries. The initiative aims to strengthen R&D capabilities and to solve issues shared among East Asian countries such as the

environment, disasters, infectious diseases, through acceleration of research exchanges in S&T fields in the East Asian region.

In cooperation with Japan Science and Technology Agency (JST), MEXT is preparing for the inauguration of the “e-ASIA Joint Research Program,” which promotes multilateral joint research in East Asia, as a concrete measure to implement the initiative. In 2011, the “e-ASIA Joint Research Forum” was held twice to discuss the fields of the joint research, the procedure of participation and management of the program, and other issues. MEXT plans to set a basic framework for the program, form an organization to manage the program and implement multilateral joint research on specific topics.

## 2 New Developments of S&T Diplomacy

### (1) Development of international activities capitalizing on Japan’s strengths

Japan is promoting activities on various issues quicker than any other nations, including the environment and energy, and its S&T maintains a high standard in the world. In order to achieve sustainable growth in the future, Japan should promote the "export of task-achieving type prescriptions" (system export), based on its high-level S&T, and should create new demands with a focus on rapidly growing Asia. Hence, the government is promoting development of systems that lead to social reforms of emerging countries, mainly in Asia, by taking advantage of Japan’s strengths.

#### 1) Active Efforts towards International Standardization

Based on the “Intellectual Property Promotion Plan of 2010” (Intellectual Property Strategy Headquarters on May 2010), a strategy to comply with international standards was drawn up in order to strengthen Japan’s leading technology in specific strategic fields, with cooperation between the government and its people. MIC is promoting aggressive and strategic activities to comply with international standards for the five major areas for the standardization, which were proposed by the “Review Team on International Standardization Strategies” under the “Task Force on ICT Policies in the Global Era.” Furthermore, to enhance user choices and strengthen Japan’s international competitiveness in the ICT industry, while also trying to build coordination with de jure standardization institutions, including the International Telecommunications Union (ITU), and de facto standardization entities in the private sector, MIC is promoting cooperation on the standardization of ICT and other technologies, thus reducing the environmental burden.

In order to secure the market in the green innovation field, an area in which Japan has strength as compared to other rapidly growing Asian countries, Japan’s technology on such field needs to be evaluated properly. Through the “Asia Standards Conformance Promotion Project [literal translation],” the Ministry of Economy, Trade and Industry (METI) is working with Asian countries to develop performance assessment methods, to promote international standardization of assessment methods and to help examination bodies in Asian countries improve their certification abilities.

#### 2) Overseas development of packaged infrastructures

In order to meet the strong demand for infrastructures, mainly in Asia, the government has held the Ministerial Meeting on the Overseas Deployment of Integrated Infrastructure Systems since September 2010 in order to support the private sector’s efforts in the infrastructure field and to make cross-sectional

and flexible decisions through political leadership.

## (2) Promotion of international activities for advanced S&T

In order to ensure further development of Japan's S&T and to enhance the synergetic effect of S&T and diplomacy, Japan needs to promote its R&D activities concerning advanced S&T in cooperation with developed countries and international organizations, and to utilize such activities for diplomatic activities. For this reason, Japan must aggressively promote international activities for advanced S&T and advance activities for improving international research networks while preventing the leakage of technology.

### 1) Improvement of international research networks

Japan needs to improve international research networks in various areas with countries that have the world highest level of S&T and needs to promote international cooperation concerning advanced S&T that utilizes quality research resources from overseas.

Various exchanges of researchers are currently being conducted among universities and research institutions at both the individual and organizational level. In order to develop S&T and academic studies, Japan needs to attract many leading researchers from both home and abroad, so that Japanese researchers interact with top researchers from around the world and improve their skills.

#### (i) The current international mobility of Japanese researchers

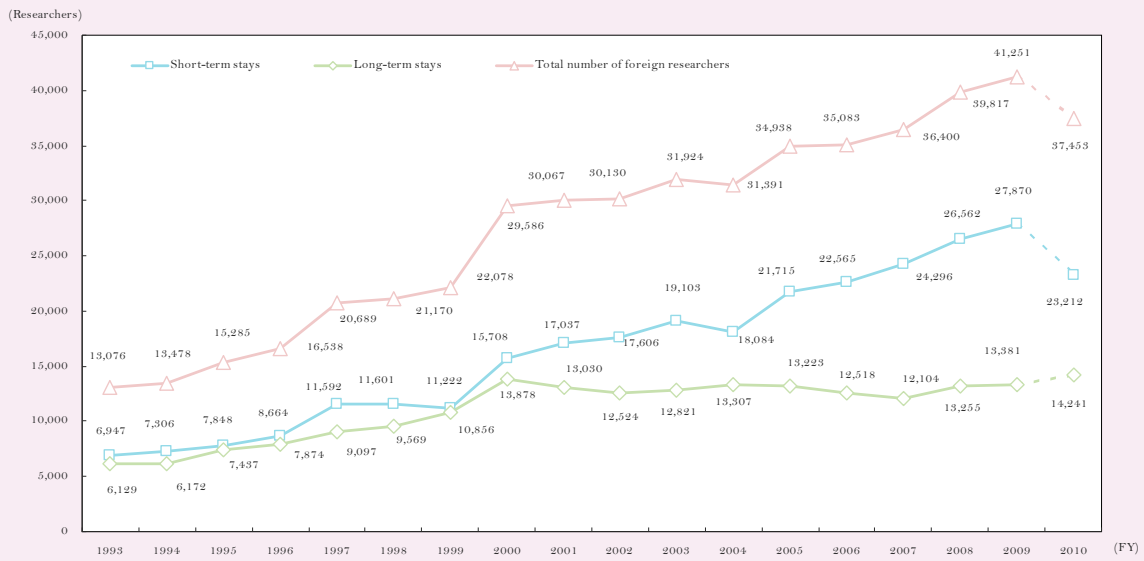
Looking at the number of foreign researchers accepted in universities and independent administrative institutions in Japan (FY 2010), although those accepted for long-term stays of more than 30 days have increased slightly, the total number of foreign researchers has decreased because those accepted for short-term stays have actually decreased (Figure 2-3-12). The proportion of long-term foreign researchers among the total number of researchers in Japan's universities and independent administrative institutions was 6.3%<sup>1</sup>, which is smaller than the proportion of foreign researchers in the U.K., which reached 19.1%<sup>2</sup> (2005 to 2006).

In terms of the amount of Japanese researchers sent abroad (FY 2010), the number of researchers sent for short-term stays and the total number of researchers sent abroad leveled off, yet the number of researchers sent for long-term stays of over 30 days has increased slightly since FY 2008 (Figure 2-3-13).

<sup>1</sup> Source: MEXT, "Survey on International Research Exchanges in FY2010"

<sup>2</sup> Universities UK 「Policy briefing, Talent wars: The international market for academic staff」 (2007)

Figure 2-3-12/ Transition of Number of Foreign Researchers by Duration of Stay (Short-term, Long-term)



Note 1: "Long-term" refers to a period of more than 30 days and "short-term" refers to a period of 30 days or less in this survey.  
 Note 2: The numbers for FY2010 include post-doctorates, etc. (outline marker, dotted lines)  
 Source: MEXT, "Survey on International Research Exchanges"

Figure 2-3-13 / Transition of Number of Researchers Working Abroad by Duration of Stay (Short-term, Long-term)



Note 1: "Long-term" refers to a period of more than 30 days and "short-term" refers to a period of 30 days or less in this survey.  
 Note 2: The numbers for FY2008 include post-doctorates, etc. (outline marker, dotted lines)  
 Source: MEXT, "Survey on International Research Exchanges"

## (ii) Activities for promoting international exchange of researchers

The government is making two-way exchanges by combining two policies—dispatching young researchers abroad and inviting leading researchers from other countries—as an effort to foster and secure world-class researchers.

In order to develop young Japanese researchers and enable them to work actively in the international arena, the Japan Society for the Promotion of Science (JSPS) is carrying out various programs to dispatch young researchers abroad. The “Postdoctoral Fellowships for Research Abroad” provides individual researchers working at overseas universities or research institutions with *more* opportunities to work at excellent overseas research institutions and to interact with local researchers. The “Strategic Young Researcher Overseas Visits Program for Accelerating Brain Circulation” program supports universities and other research institutions that dispatch their researchers abroad for joint research in accordance with its international strategies.

On the other hand, to provide leading foreign researchers with opportunities to work at universities and other research institutions in Japan, JSPS is implementing the “Postdoctoral Fellowship for Foreign Researchers,” and other invitational programs that support their different career stages and purposes.

In addition, to develop human resources and create networks in the Asia and Pacific regions, JSPS holds the “HOPE Meeting with Nobel Laureates,” which provides graduate students and young researchers with opportunities to interact with Nobel laureates and other distinguished researchers.

## 2) Large-scale international projects

The government needs to promote cooperation with research communities and take their opinions into account when carrying out large-scale international projects and R&D that requires comprehensive database preparation. At that time, considering Japan's international position in each research area, the government provides support so that Japan can demonstrate leadership in the areas where it has strengths or strong interest.

## (i) International Thermonuclear Experiment Reactor (ITER)

The International Thermonuclear Experiment Reactor (ITER) Project is an international cooperation project intended to demonstrate the scientific and technological feasibility of fusion energy through the construction and operation of a fusion experimental reactor. Currently, seven Parties are participating: Japan, the EU, the U.S., Russia, China, South Korea, and India (refer to Part 2, Chapter 2, Section 2, 1 (1)).

## (ii) International Space Station (ISS)

The International Space Station (ISS) project is an international cooperation project intended to construct manned space facilities in orbit around Earth through the cooperation of five parties (Japan, the U.S., Europe, Canada and Russia). As part of this project, Japan developed and operates the Japanese Experiment Module (JEM), also known as “KIBO,” and an unmanned cargo transporter H-II Transfer Vehicle (HTV), also known as “KOUNOTORI” (refer to Part 2, Chapter 2, Section 2, 8 (1)).

## (iii) Integrated Ocean Drilling Program (IODP)

The Integrated Ocean Drilling Program (IODP), launched in 2003, is an international cooperation

program led by Japan and the U.S., and includes a total of 25 participating countries. The program is intended to help researchers better understand global environmental changes, the structure of Earth's crust, and the deep biosphere of the crust, which is achieved by drilling through the bottom of the deep seafloor. The deep seafloor is drilled using multiple drilling vessels. The main two drill vessels include Japan's deep-sea drilling vessel "CHIKYU," capable of drilling 7000m below the seafloor, and a drill-ship supplied by the U.S. Also used, is Europe's mission-specific drilling vessel (refer to Part 2, Chapter 2, Section 2, 8 (2)).

#### (iv) Large Hadron Collider (LHC)

The Large Hadron Collider (LHC) project uses an enormous circular accelerator at the European Organization for Nuclear Research (CERN) in order to reproduce the state at the creation of the universe (immediately after the Big Bang). The project plans to conduct experiments to search for unknown particles and to explore the internal structure of substances. The construction of the accelerator was completed in 2008 through international cooperation, including the CERN member countries, Japan and the U.S. At present, experimental research within the world-highest energy field is being conducted.

About 200 Japanese researchers are participating in the project, mainly in the ATLAS experiment searching for "Higgs boson," which is considered to be an origin of mass.

### 3) Collection and analysis of overseas S&T information and the practical use of overseas research centers

In order to use overseas information for policy decisions on S&T, it is necessary to set up a system to collect, accumulate and analyze overseas information continuously and systematically, and to use it in a cross-sectional manner. For this reason, MEXT and all organizations concerned are working on such activities.

As one of Japan's concrete efforts, the National Institute of Science and Technology Policy (NISTEP) collects information and data on overseas S&T trends, compares them with Japan's conditions and analyzes them. Based on such objective and quantitative data, NISTEP conducts research studies useful for the promotion of S&T policies.

In addition, the JST Center for Research & Development Strategy (CRDS) carries out the investigation and analysis of overseas trends that are useful to formulate STI policies.

Furthermore, the Japan Society for the Promotion of Science (JSPS) gathers information on overseas academic trends, university reforms and the like through its overseas offices.

### 4) Systematic Efforts for S&T International Activities

#### (i) Practical use of international frameworks

##### a) G8

The G8 Deauville Summit was held in May 2011 in Deauville, France and then Prime Minister Kan represented Japan. The G8 Leaders adopted the "Deauville G8 Declaration," which included solidarity with Japan which had been struck by the Great East Japan Earthquake, nuclear safety, Internet, development and political and security issues.

The G8 Environment Ministers Meeting held in April 2009 approved the launch of the International

Research Network for Low Carbon Societies (LCS-RNet), which consists of research organizations working on the creation of a low-carbon society in each country. The third annual meeting was held in France in October 2011. Currently, sixteen research organizations are participating from seven countries including Japan.

b) Asia-Pacific Economic Cooperation (APEC)

Regarding the S&T field in APEC, the APEC Industrial Science and Technology Working Group (ISTWG) conducts surveys on the subjects in which each economy is interested, holds workshops and training courses, carries out various projects, and exchanges information about industrial and S&T policies among the economies. Following the meetings in 2010, ISTWG held the “Innovation Policy Dialogue” in 2011, where policymakers of the economies learned from each other in order to improve both the drafting and implementation abilities of innovation policies in the APEC region.

MEXT participates in projects concerning S&T human resources development, under the framework of ISTWG. In order to accumulate effective disaster reduction “know-hows” rooted in the regional characteristics of each country, MEXT, in cooperation with research institutions of other economies and international organizations related to disaster reduction, is disseminating the information about infrastructure for disaster-reduction technology and knowledge throughout the Asian region via the “Disaster Reduction Hyperbase-Asian Application (DRH-Asia).”

c) Association of South-East Asian Nations (ASEAN)

As part of the activities of the ASEAN Committee on Science and Technology (COST), Japan, China, the Republic of Korea and ASEAN countries, called ASEAN COST+3, are collaborating with each other. MEXT is taking leadership of ASEAN COST+3 on the Japanese side. The Sixth Meeting of ASEAN COST+3 was held in Cheju, the Republic of Korea in December, 2011, and opinions were exchanged regarding the joint projects of the ASEAN+3 countries.

d) East Asia Summit (EAS)

The East Asia Summit (EAS) has been held to have direct talks between the leaders about critical issues for the region and the international community, as well as to promote concrete cooperation concerning the common issues in the region under the initiative of its leaders. At the Sixth East Asia Summit, held in Bali, Indonesia in November 2011, Prime Minister Noda pointed to the importance of cooperation in science and technology, saying Japan would act positively in this field. The chairman’s statement included words that welcomed Japan’s initiative for implementing the joint research program to be conducted under the East Asia Science and Innovation Area Initiative.

e) Other

(Asia-Pacific Regional Space Agency Forum (APRSAF))

Japan has hosted the Asia-Pacific Regional Space Agency Forum (APRSAF) since 1993 as an opportunity to exchange information and promote multilateral cooperation in the Asia-Pacific region regarding activities in space and use of space. Initiatives conducted by APRSAF have achieved many results and one of them is the “Sentinel Asia” project, which shares disaster-related information, such as



earth-observation satellite data, on the Internet in order to reduce the damages caused by natural disasters. The project was promoted with the cooperation of 24 countries or regions, 68 institutions and 12 international organizations (as of February 2012), and Japan received earth-observation satellite data from participating nations when the GEJE hit the country. When the APRSAF meeting was held in Singapore in December, 2011, the Promotion of Asian Cooperation on KIBO/ISS Initiative (PACK-I) was launched using “KIBO,” the ISS Japanese Experiment Module. The initiative promoted an understanding of ISS and cooperation on human resources development in the Asian region, and studied the feasibility of new projects using “KIBO.” In order to use space technology for water and agricultural fields, the Climate Change Regional Readiness Review for Key Climate Missions (Climate R<sup>3</sup>) was also launched.

(Global Biodiversity Information Facility (GBIF))

GBIF is intended to collect data on biodiversity and use it globally.

(The Global Earth Observation System of Systems (GEOSS))

GEOSS is a comprehensive framework that coordinates various observation systems, such as satellites and ground observation that contribute to nine social benefit areas, including disaster and climate (Refer to Part 2, Chapter 3, Section 1, 3 (1)).

(ARGO Project)

ARGO is an international project that monitors temperatures and salt contents of the oceans in real time by deploying more than 3,000 buoys called Argo floats in the oceans around the globe. The World Meteorological Organization (WMO), the Intergovernmental Oceanographic Commission (IOC) and other international institutions, as well as over 30 nations, including the U.S., Australia and Japan, are participating in the project. This project is expected to help researchers grasp detailed changes inside the oceans and forecast climate changes more precisely. In Japan, MEXT and the Japan Meteorological Agency worked together to deploy Argo floats, and about 270 Argo floats were in operation as of December 2011.

(ii) Practical use of international organizations

a) The United Nations (UN)

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

UNESCO is conducting programs to resolve global 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 resource development projects in the S&T fields in the Asia-Pacific region through its contribution to UNESCO trust funds and by dispatching experts to the commissions. Furthermore, Japan has been promoting the implementation of Education for Sustainable Development (ESD). In addition to ESD, the government submitted a proposal on “Sustainability Science” to the UNESCO Secretariat at the 36<sup>th</sup> UNESCO General Conference held in November 2011. The



proposal required the integrated approach to resolve global issues collaborating with the natural science and social and human science.

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

OECD is engaged in S&T activities, including the exchange of opinions, experiences, information and personnel among participating countries and the preparation of statistical information through its many committees and agencies. These include the Council at Ministerial Level; the Committee for Scientific and Technological Policy (CSTP); the Committee for Information, Computer and Communications Policy (ICCP); the Committee on Industry, Innovation and Entrepreneurship (CIIE); the Committee for Agriculture (AGR); the Environment Policy Committee (EPOC); the Nuclear Energy Agency (NEA); and the International Energy Agency (IEA).

At CSTP, members exchange information and opinions on S&T policies and study the role that science, technology and innovation plays in economic growth, the improvement and enhancement of research systems, the roles of the government and the private sector in R&D, and ways of international R&D cooperation.

There are six subgroups under CSTP: the Global Science Forum (GSF), Research Institutions and Human Resources (RIHR), the Working Party on Innovation and Technology Policy (TIP), the Working Party on Biotechnology (WPB), the Working Party on Nanotechnology (WPN), and the Working Party of National Experts on Science and Technology Indicators (NESTI). The main activities where Japan takes leadership by dispatching a chairperson or vice-chairperson are as follows:

(Global Science Forum (GSF))

GSF is held to exchange information about each member country's studies, particularly on mega science<sup>1</sup> and global challenges, and to present suggestions for the future in order to promote S&T cooperation between member countries. GSF offers opportunities to exchange opinions, to look for new international cooperation in specific S&T domains, to establish international frameworks helpful for important decisions on science policies and to reflect scientific findings about global challenges. In 2011, a report proposed by Japan about "Opportunities, Challenges and Good Practices in International Research Cooperation between Developed and Developing Countries" was completed.

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

TIP discusses policies related to innovation and technology, in order to enhance productivity, promote the creation and utilization of knowledge, encourage sustainable growth, and promote the creation of employment for highly skilled technicians.

In 2011, TIP conducted a case study on open innovation as part of the "Financing, transferring and commercializing knowledge" project and also held a discussion about each project.

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

NESTI provides supervision, advice and adjustments concerning statistical work, and also contributes

<sup>1</sup> Large-scale projects for scientific R&D

to the development of indicators and quantitative analysis helpful for the promotion of STI policies. Specifically, NESTI sponsors discussions and examinations regarding frameworks for international comparison, investigation methods, and the development of S&T indicators, such as those concerning research expenses and human resources. Japan delegates experts to the OECD office, and they are working on development of new indicators. In FY 2011, a discussion was held about the methods of R&D measurement that suit the present conditions, development of innovation surveys in each country and other matters.

c) International Science and Technology Center (ISTC)

ISTC is an international organization that was established by four parties—Japan, the U.S., the EU and Russia—in March, 1994, in order to support R&D projects for peaceful purposes in which researchers who had been engaged in the development of weapons of mass destruction in the former Soviet Union (FSU) are involved. As of February 2012, the amount of the funds earmarked for approved projects totaled about 860.5 million U.S. dollars, and the number of participating researchers from Russia and CIS countries stood at more than 74,000.

In February 2012, ISTC and the Science and Technology Center in Ukraine (STCU) held two events co-organized by the Cabinet Office, MEXT and Ministry of the Environment, in order to make a contribution to the effort underway to cope with the aftermath of the accident at TEPCO Fukushima Daiichi Nuclear Power Plant. These seminars utilized the results of over 17 years of research at ISTC. One was the “Symposium on the Application and R&D of the Technologies of Decontamination, Remediation and Restoration of Environments,” held in Tokyo, and the other was the “Seminar for the Restoration of Fukushima,” held in Fukushima.

(iii) Practical use of research institutions

(Economic Research Institute for ASEAN and East Asia (ERIA))

ERIA is an institution intended to conduct policy research and to provide policy recommendations for the promotion of East Asian economic integration. With “Deepening Economic Integration,” “Narrowing Development Gaps” and “Sustainable Development” as the main three objectives, the focus is on working on research and conducting symposiums and human resource development in a wide range of areas, including innovation policies. In FY 2011, ERIA conducted the production and use of biomass and research on medical ICT, and held seminars.

(iv) International research grant program

(Human Frontier Science Program (HFSP))

HFSP is an international research grant program aimed at supporting basic, international, joint research to resolve complex mechanisms of living organisms, and was advocated by Japan at the Venice Summit in June 1987. HFSP is now operated by 14 parties—Japan, the U.S., France, Germany, the EU, the UK, Switzerland, Canada, Italy, Australia, South Korea, New Zealand, India and Norway. Japan has been an active supporter of the program since its establishment. The Program offers grants for research expenses to international joint-research teams and fellowships that cover the travel, living and other expenses of young researchers conducting research abroad. The program also organizes the HFSP awardees’ meetings.

With 18 HFSP research grant awardees having received the Nobel Prize up to FY 2011, the program has been highly acclaimed worldwide.

(v) Actions by Japan's academic institutions

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

On behalf of Japanese scientists and scientific communities, SCJ has been striving for cooperation with many countries and has been holding the memberships of the 45 international scientific organizations, including the International Council for Science (ICSU<sup>1</sup>) and the Inter Academy Panel on International Issues (IAP<sup>2</sup>).

Academies of the G8 countries have been involved in drawing up of the joint-statements delivering opinions from the scientific viewpoint relevant to the annual G8 Summit's agenda. In May, 2011, SCJ announced joint-statements, concerning "Education for a science-based global development" and "Water and Health," in cooperation with the science academies of the G8 nations prior to the G8 Summit in Deauville, France. In Japan, the president of SCJ delivered the statements to the Prime Minister in person. The meeting of the science academies (G-Science Meeting) was held on February 27 and 28, 2012, in Washington DC, prior to the G8 Summit to be held in the U.S.

In addition, to promote partnerships and collaboration among Asian countries in the field of academic research, Science Council of Asia (SCA), which comprises 20 scientific organizations in 12 Asian countries, held the General Assembly meeting in Mongolia in July, 2011, with the main theme of "Combating Land Degradation in Asia."

(vi) Actions for peaceful use of nuclear energy

Japan is leading international cooperation for technical and human resources development regarding nuclear non-proliferation and nuclear security while gaining the trust of other nations in regard to Japan's peaceful use of nuclear energy.

Japan concluded the safeguards agreement between Japan and the International Atomic Energy Agency (IAEA) in December 1977, and accepted the "safeguards," under which the IAEA shall confirm that the parties use nuclear materials only for peaceful purposes and never divert them to nuclear weapons. In response to this, the government has the system of accounting for and control of all nuclear material in Japan subject to "safeguards" under the "Nuclear Reactor Regulation Act". As a result of the inspection, and in order to verify the information submitted to the IAEA by Japan in regard to its nuclear materials the IAEA admitted that all of Japan's nuclear materials were used for peaceful purposes.

At the Nuclear Security Summit held in the U.S. in 2010, Japan announced that it would promote the establishment of a support center for the enhancement of Asian nuclear security and the development of techniques for the measurement, detection and identification of nuclear materials. Later, the Japan Atomic Energy Agency (JAEA) built the "Integrated Support Center for Nuclear Nonproliferation and Nuclear Security," and provided training in nuclear nonproliferation and nuclear security to a total of over 400

<sup>1</sup> It was founded in 1931 as a nongovernmental, nonprofit, international scientific organization intended to promote international activities in the science and applied science fields for the benefit of humanity.

<sup>2</sup> IAP - the global network of science academies : It was founded in 1995 as a forum of the world science academies. The Science Council of Japan had been a member of its executive committee from 2006 to 2009.

persons from more than fifteen countries. In addition, starting in 2011, at JAEA, Japan and the U.S. have jointly conducted verification testing of non-destructive measurement equipment for plutonium present in spent fuel, the development of non-destructive measurement techniques by nuclear resonance fluorescence, and the development of nuclear identification techniques to identify the origin of illegal nuclear materials. Through these efforts, the Japanese government promotes international cooperation for technical and human resources development regarding nuclear non-proliferation and nuclear security while gaining the trust of other countries in regard to Japan's peaceful use of nuclear energy.

(vii) Other international efforts

In October 2011, with twenty-seven countries' Science and Technology Ministers and representatives attending, the Cabinet Office held the Science and Technology Ministers' Roundtable Meeting to discuss the "How Science and Technology Can Contribute to the Construction of a Secure and Safe Society?," in addition to holding several bilateral meetings.

(3) Promotion of coordination and cooperation with developing countries for global-scale issues

In order to fulfill its responsibility in the global community, the Japanese government is promoting international cooperation with developing countries including Asia, Africa and Latin America, to contribute to the development of S&T and human resource development within these countries. Specifically, the government is promoting joint research with the developing countries through the implementation of the "Science and Technology Research Partnership for Sustainable Development (SATREPS)" program. MEXT and JST have expertise in Japan's leading edge S&T, and the Ministry of Foreign Affairs and the Japan International Cooperation Agency (JICA) are in charge of the Official Development Assistance (ODA). They work together and support universities and research institutions in Japan and developing countries. Thus, the government promotes S&T cooperation with these countries targeting global issues in such fields as environment/energy, bio-resources, natural disaster prevention and infectious disease control.



**Science and Technology Research Partnership for Sustainable Development (SATREPS) "Study on Glacial Lake Outburst Floods in the Bhutan Himalayas"**

Source: Japan Science and Technology Agency

MEXT is making an effort to combine international joint research with the Japanese Government Scholarship Program by accepting foreigners who wish to study at a SATREPS participating university in

Japan as a government-sponsored international student. As a result, young researchers from partner countries who participate in the international joint research program can obtain academic degrees in Japan. MEXT is thus promoting diversified cooperation on human resource development.

In addition, MEXT, Japan Society for the Promotion of Science (JSPS), the Ministry of Foreign Affairs and JICA cooperate to implement the “Dispatch of Science and Technology Researchers” program, in order to establish fundamentals of research in developing countries and to develop human resources through international joint research by dispatching Japanese researchers to partner countries. The program thus helps researchers of partner countries to develop their capabilities in order to tackle global issues.

Furthermore, the Ministry of Agriculture, Forestry and Fisheries (MAFF) is developing biotic stress tolerant crops, and supporting research and capacity building of international agricultural research institutions, to increase productivity of rice, tubers, legumes and other crops in developing countries, for tackling global-scale issues such as global food security and climate change by international collaborative research projects.

#### (4) Reinforcement of foundations for developing international S&T activities

In order to strategically advance bilateral and multilateral international cooperation regarding S&T, Japan needs to further promote government-to-government dialogues with other countries and to continuously collect and use information on overseas S&T trends. For this reason, the government is making efforts to enhance infrastructures to develop S&T international activities.

##### 1) Cooperation with other countries

###### (i) Cooperation with China, South Korea and other Asian countries

In the framework of the Japan-China-Korea trilateral cooperation, the Minister of Education, Culture, Sports, Science and Technology attends the Japan-China-Korea Ministerial Meeting on Science and Technology Cooperation.

In order to prepare for the third Japan-China-Korea Ministerial Meeting on Science and Technology Cooperation scheduled for April 2012, in Shanghai, China, a preliminary meeting was held in March of that year in Beijing, China.

As a result of the Japan-China-Korea Ministerial Meeting on Science and Technology and the director-generals meeting, which is held alternately with the ministerial meeting, Japanese-Chinese-Korean Cooperative Joint Research Collaboration Program (JRCP) and the Young Researchers’ Workshop were conducted. In March 2012, the “Japan-China-Korea Green Technology Forum” was held in Tokyo, in order to share research results and build a network regarding the green technology field in all three nations.

In addition to Japan-China-Korea Trilateral cooperation, the three countries also hold the Science and Technology Cooperation Committee, exchange information and researchers, and carry out joint research to enhance Japan-China and Japan-Korea S&T capabilities.

Between Japan and China, the Japan-China Science and Technology Cooperation Committee took place in February 2010, and approved a new Japan-China S&T project. In addition, MEXT and the Chinese Academy of Sciences hold the Japan-China Science and Technology Policy Seminar every year, in order to exchange opinions on S&T policies. In November 2011, the eighth seminar was held in Obihiro, Hokkaido.

Between Japan and South Korea, the Japanese Minister of State for Science and Technology Policy and the Korean Minister of Education, Science and Technology had a talk in March 2009, and agreed to continue to have policy dialogues between the Council for Science and Technology Policy of Japan and the National Science and Technology Council of Korea. In November 2011, the fourth policy dialogue was held in South Korea.

Besides the above, JSPS carries out the “Asian CORE Program,” “Asia -Africa Science Platform Program” and “A3 Foresight Program,” in order to support interaction between research centers in Asian countries, develop scientific research networks and foster young researchers.

As for other Asian countries, the Japan-Vietnam Joint Committee on Science and Technology Cooperation was held in August 2011.

#### (ii) Cooperation with European countries and North America

Between Japan, European countries and North America, cooperative activities are being actively promoted in the advanced S&T fields, such as life sciences, nanotechnology, materials, environmental sciences, nuclear technology, and space development. These cooperative activities include holding joint committee meetings based on bilateral agreements on S&T cooperation, information exchange, interaction between researchers and joint research.

Between Japan and the EU, in accordance with the agreement on S&T cooperation, signed in November 2009, and become effective in March 2011, the first Japan-EU Joint Committee on Science and Technology Cooperation was held in June of that year and the committee decided to support joint research in the field of “development of new materials for the substitution of critical metals.” Japan has also participated in “Connecting and Coordinating European Research and Technology Development with Japan (CONCERT-Japan)”, an ERA-NET initiative under FP7, since January 2011. In this project, each government agency and a fund-allocating agency form a consortium and the consortium holds a variety of symposiums and meetings to exchange information regarding specific S&T policies of both Japan and the EU and to build networks among participating countries.

Besides, in 2011, Japan held meetings of the Joint Committee on Science and Technology Cooperation with Poland in January, with the Netherlands in February, with Italy in October and with the U.K. and Ukraine in November.

#### (iii) Cooperation with African countries

The Second Japan-Africa Science and Technology Ministers’ Meeting was held in October 2010 and both parties reached a consensus on cooperating in science, technology and innovation in order to contribute to the creation of innovation and the solution of regional and global issues.

#### 2) Policy dialogues regarding S&T at the private level

In order to broaden the range of international activities for S&T diplomacy, the Japanese government supports policy dialogues regarding S&T at the private level. Aiming to promote the establishment of international communication, the government support to hold international meetings with a wide range of stakeholders in the society attending, so that international S&T leaders in industry, government and universities can discuss what S&T should be in the future. In FY 2011, the government carried out the

“Program for the Promotion of International Policy Dialogues Contributing to the Development of Science and Technology Diplomacy.” This is one of the Programs for the Promotion of International Strategy for Science and Technology supported by the Strategic Funds for the Promotion of Science and Technology.