CRDS-FY2011-SP-09

Strategic Proposal

Toward the Establishment of Principles Regarding the Roles and Responsibilities of Science and Government in Policy Making

Center for Research and Development Strategy
Japan Science and Technology Agency

Executive Summary

The government makes policies using scientific knowledge in a broad range of fields. Science can provide an important basis for ensuring the validity and reliability of decision making. In the 21st century, as the relationships of science and technology to society and economics are greatly increasing their complexity and uncertainty, the role to be played by science in the process of policy making will continue to grow.

Recently, efforts to ensure the validity and reliability of science-based policy making have been made overseas. In the United States, while rules concerning the process of scientific advice have long existed, the Obama administration is accelerating efforts to ensure scientific integrity in the government. In Great Britain, various principles regarding science in policy making have been established since the BSE crisis in the 1990s. In many other advanced nations as well as international organizations such as the European Union (EU) and InterAcademy Council (IAC), similar efforts have been made.

In Japan, the Great East Japan Earthquake and the Fukushima Daiichi Nuclear Power Station accident in March 2011 have prompted the examination on the roles and responsibilities of science and government in policy making. The 4th Science and Technology Basic Plan, adopted by the cabinet in August 2011, specifically pointed out the need to examine the relationships of science and technology to policy and to establish basic principles on such relationships.

This proposal presents a draft of principles on the roles and responsibilities of science and government in policy making. This draft is intended as a starting point for discussion among a wide range of stakeholders to raise awareness of the importance of this issue and refine the rules on science-based policy making. Through such discussion, the government should establish the principles, and relevant organizations should then consider drafting their own guidelines. The draft principles in this proposal consist of the following items.

(1) The role of scientific advice in policy making
(2) Seeking scientific advice in a timely and pertinent manner
(3) Ensuring the independence of scientific advisers
(4) Awareness of responsibility as scientific advisers
(5) Achieving broad perspectives and balance
(6) Ensuring the quality of advice and integrating viewpoints
(7) Proper handling of uncertainty and diversity
(8) Free disclosure of scientific knowledge
(9) Even-handed treatment of scientific advice by the government
(10) Ensuring transparency of the scientific advice process

This proposal also presents measures necessary for laying foundations for science-based policy making. For example, efforts to establish mechanisms for effective scientific advice in emergencies, ensure enforcement of the principles and guidelines, and foster education concerning the relationships of science and technology to policy and society are necessary. Through such initiatives, along with the organizational reforms currently being considered by the government, the effectiveness and integrity of science-based policy making in Japan should be secured.

Contents

1. The Proposal

As today's government faces many difficult, complex issues in a broad range of policy fields, the role that science (including engineering, medicine, etc.) should play in policy making is extremely large. Scientific knowledge helps to ensure that appropriate policy decisions are made, and provides a basis for government accountability. In the 21st century, as the relationships of science and technology to society and economics are greatly increasing their complexity and uncertainty, expectations for science to properly contribute to the solution of various policy issues will continue to grow.

When the government makes policies based on scientific knowledge, ensuring integrity of the process is an important issue. If the independence of scientists (including engineers, doctors, etc.) providing the government with scientific advice were questioned, or if fairness and transparency in applying scientific knowledge to policy making were impaired, that would not only lead to wrong policy decisions but also damage society's confidence in science itself and shake the legitimacy of policy making fundamentally. Science-based policy making cannot hold up without ensuring its integrity.

Outside Japan, much discussion has been done on the role of science in policy making in recent years. More and more nations have drawn up principles, guidelines, or codes of conduct defining the roles and responsibilities of science and government in policy making. In Japan, meanwhile, the Great East Japan Earthquake and the Fukushima Daiichi Nuclear Power Station accident in March 2011 have reaffirmed the critical importance of the role and responsibility of science in policy making. The 4th Science and Technology Basic Plan, adopted by the cabinet on August 19 of the same year, specifically stated: "The government shall examine the relationships of science and technology to policy, including issues related to the use of scientific and technological results in planning and promoting policies, from broad-ranging aspects, and draw up basic principles."

This proposal presents a draft of principles on the roles and responsibilities of science and government in policy making, and calls for building foundations for science-based policy making. Discussions are now under way in the government on establishing necessary organizations for scientific advice, such as the appointment of Science, Technology, and Innovation Advisers (provisional name). Along with such initiatives, Japan should aim to ensure the effectiveness and integrity of science-based policy making by realizing the ideas in this proposal.

Use of Terminology

The word "science" is used in this proposal mainly with the natural sciences (including engineering, medicine, etc.) in mind. Most of the contents of this proposal should also be applied to the humanities and social sciences. The specific ways in which they are applied are to be decided flexibly.

The word "scientific advice" means advice that scientists offer the government based on their expertise. The government makes policies based on scientific knowledge obtained in varied forms, including scientific advice.

The word "scientists" refers to a concept encompassing individual scientists (including engineers, doctors, etc.), organizations of scientists, and the scientific community. "Scientific advisers" are individuals and organizations giving scientific advice, while "scientific community" refers to the community of scientists in general in Japan.

The word "government" means those who are responsible for exercising the three powers of legislation, administration, and judicature; however, the contents of this proposal should be most directly applied to the executive branch, including ministers and other political appointees.

1. 1 Establishing principles

As the Japanese government will promote science-based policy making, its integrity must be ensured. Both the scientists who generate scientific knowledge and the government that makes use of it need to act in proper awareness of their respective roles and responsibilities as well as of the relationships between scientists and the government. Below is a draft proposal of general principles that should be referenced in establishing such relationships.

Note that this draft of principles is intended as a starting point for discussion among a wide range of stakeholders to raise awareness of the importance of the issue of scientific advice and to cultivate and refine the rules of how science and government should fulfill their proper roles and responsibilities in policy making. Through such a process of discussion, principles regarding the roles and responsibilities of science and government will need to be established as a foundation for science-based policy making in Japan.

It is hoped that, in response to the establishment of the principles, individual organizations involved in science-based policy making will then begin considering how they should draw up their own guidelines. Because government agencies and academic organizations are engaged with various policy fields and scientific fields, they should take into consideration particular situations of their own fields in drawing up their own guidelines and implementing them appropriately.

[Draft proposal of principles]

In contemporary society, the role that science (including engineering, medicine, etc.) should play in policy making is extremely large. Scientific knowledge helps to ensure that appropriate policy decisions are made, and provides a basis for government accountability. Accordingly, scientists as well as the government have a public responsibility to realize science-based policy making in a proper manner. For both sides to fulfill that responsibility, they shall observe the following principles.

(1) The role of scientific advice in policy making

The government and scientists shall share a common understanding of the importance of scientific advice and its role in policy making. Scientific knowledge is an essential element in the policy making process, and the government must duly respect it. At the same time, scientific advisers must recognize that scientific knowledge is not the sole basis of government decision making.

(2) Seeking scientific advice in a timely and pertinent manner

The government shall endeavor to identify policy issues that require scientific knowledge in a timely and pertinent manner, and act to acquire the best scientific knowledge available on the issues.

(3) Ensuring the independence of scientific advisers

The government must not make political intervention in the activities of scientific advisers.

Scientific advisers shall give their advice from an objective and fair standpoint, without being swayed by government or other organizations or individuals that can arbitrarily influence their scientific advice. As a means to ensure such objectivity and fairness, scientific advisers shall declare their own conflicts of interest.

(4) Awareness of responsibility as scientific advisers

Scientists shall provide scientific advice always for the public welfare. When scientists accept the role as scientific advisers to the government, they shall be aware of the large influence scientific advice has on the process of public policy formulation, and shall act in awareness of their responsibility.

(5) Achieving broad perspectives and balance

When the government seeks scientific advice, it should strive to secure the participation of scientists with appropriate insight and experience matched to the nature of the issues, and to obtain balanced advice based on broad perspectives.

(6) Ensuring the quality of advice and integrating viewpoints

Scientific advisers must ensure the quality of their own advice to the maximum extent possible.

To that end, scientific advisers shall strive for a balanced treatment of observational and experimental results and of cited papers, and seek to improve the quality of scientific advice through peer reviews. The Science Council of Japan and academic societies shall, where appropriate, endeavor to present high-quality scientific advice by integrating views of the nation's scientific community.

The government shall ensure, as needed, that scientific knowledge used in policy making has gone through independent peer reviews by qualified experts.

(7) Proper handling of uncertainty and diversity

Scientific advisers shall provide policy makers with clear explanations of uncertainties and diversity of views associated with scientific knowledge. The government shall respect such uncertainties and diversity of views.

(8) Free disclosure of scientific knowledge

In principle, scientific advisers are free to make their scientific knowledge public. They shall do so responsibly, however, in awareness of the large influence that scientific knowledge can have on policy making and public opinion as well as on society as a whole.

(9) Even-handed treatment of scientific advice by the government

The government must treat with fairness the scientific knowledge it acquires. It must not approach scientific advice with any preconception, distort scientific knowledge when making it public, or intentionally add wrong interpretations when using advice in policy making.

The government should explain how scientific advice was considered when drawing up policy. It is especially important for the government to explain the rationales when making policy decisions that are in conflict with the scientific advice obtained.

(10) Ensuring transparency of the scientific advice process

To improve the quality and reliability of policy making based on scientific advice, the government shall ensure transparency of the scientific advice process.

1.2 Laying foundations for science-based policy making

In promoting science-based policy making, it is necessary to lay appropriate foundations for it, along with establishing codes of conduct in accord with the above general principles.

The government is currently moving toward enhancing the systems for scientific advice, including the appointment of Science, Technology, and Innovation Advisers (provisional name), strengthening the related secretariat and think-tank functions, and improving liaison with the Science Council of Japan. It is expected that, based on such reform visions, the government, the Science Council of Japan and others will cooperate to design concrete organizational and institutional arrangements.

In addition, such initiatives as the following will be essential to ensure the effectiveness and integrity of science-based policy making in Japan.

(1) Establishing a foundation for scientific advice in emergency situations

There are particularly strong societal needs in Japan for ensuring the effectiveness of scientific advice in emergencies. In addition to implementing organizational measures such as the appointment of Science, Technology, and Innovation Advisers (provisional name), the government should promote initiatives to effectively mobilize scientific knowledge in preparation for an emergency, including the compilation of a database of experts.

(2) Ensuring implementation of the principles

In addition to formulating principles and guidelines regarding the roles and responsibilities of science and government in policy making, steps must be taken to ensure steady enforcement of them. Under cooperation among academic societies, universities, etc., the principles should be made widely known; also, opportunities for training by those organizations should be provided. In addition, a mechanism should be created to confirm the commitment of scientists to the principles when they assume positions to provide scientific advices.

After relevant organizations draft their own guidelines in response to the formulation of the principles, they should make positive efforts to enforce such guidelines. It is also important to note that, while the role to be played by the media in policy making is outside the scope of this proposal, discussion on it should be done, given the large influence that the media can have on policy making and on society as a whole in handling scientific issues.

(3) Fostering a culture for science-based policy making

Measures should be taken to let all those concerned, and more widely, all layers of society, to be aware of the need for science-based policy making and the critical importance of ensuring its effectiveness and integrity. Possible approaches include: Encouraging academic societies to have opportunities to discuss the relationships of science to government policy and society (for example in their annual meetings); encouraging relevant organizations to appoint officers and set up sections in charge of relevant issues; strengthening education concerning the relationships of science to society in college and even primary and secondary education. Specifically, as the public understanding of uncertainties and risks of science and technology is crucial for science-based policy making, communication activities on such issues among scientists, the government, and society should be promoted.

2. Backgrounds

2.1 The importance of science-based policy making

The government makes policies based on scientific knowledge in various policy fields. For example, in formulating policies related to global warming, scientific knowledge in such fields as meteorology, ecology, and oceanography is necessary; in addition, knowledge in various engineering fields and in economics, political science, and other humanities and social sciences fields is essential. Generally, in policy fields related to environment and energy, safety and health, and medicine, knowledge in natural sciences (including engineering and medical science) is indispensable; in other fields, knowledge in the humanities and social sciences fields greatly influences government policy making.

As the policy issues faced by the government have become increasingly complex and difficult in recent years, involvement of science in the policy making process has deepened. Particularly in such policy fields as science, technology, and innovation, environment and energy, and medical and health care, the need to promote policy making based on scientific evidence has been increasingly emphasized. The relationships between science and the government will get even more tightly integrated in the future.

2.2 The need for ensuring integrity in science-based policy making

When the government makes policies based on scientific knowledge, the validity and reliability of the process must be ensured. That is not necessarily easy, however, as shown in Figure 1. In the first place, the scientific knowledge provided by scientists to the government frequently contains uncertainties and diverse opinions. In addition, the process or contents of scientific advice may be influenced by political factors. It can also be possible that the government would use scientific knowledge in biased ways, or unduly favor scientists who obediently follow government policies. One could also imagine cases in which scientists are affected by conflicts of interest or tempted to provide scientific advice that serves to simply legitimize the government's predetermined policies.

If such things actually occurred, that would not only lead to wrong policy decisions but also damage society's trust in science itself and shake the legitimacy of science-based policy making fundamentally. It is important to recognize that various factors can potentially threaten the validity and reliability of science-based policy making.

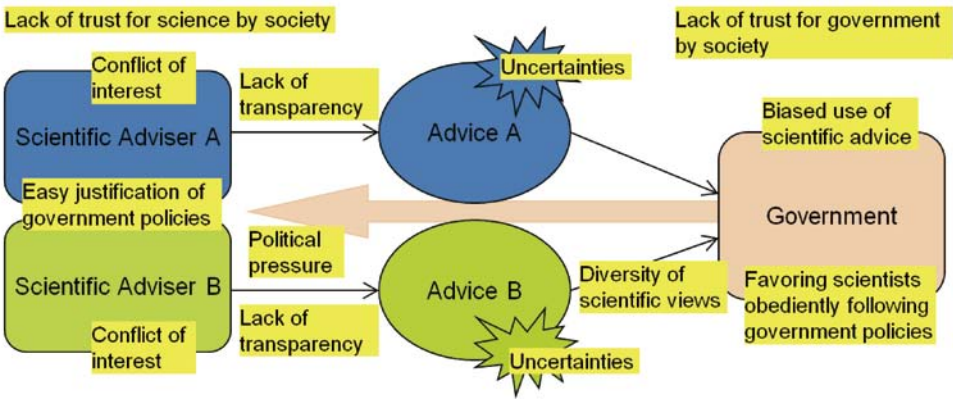

Figure 1. Examples of factors potentially threatening the validity and reliability of scientific advice

2.3 Trends outside Japan

A series of recent events overseas have raised questions about the role of science in policy making. In the United States, during the Administration of George W. Bush (2001–2009), for example, it is claimed that government scientists were subjected to undue political pressure and that scientific knowledge was handled inappropriately. Even during the Obama administration (2009-), suspicions were raised that scientific knowledge regarding the 2010 Gulf of Mexico oil spill was intentionally misinterpreted.

Even at the international level, problems related to the integrity of science used in policy making have received attention. Public confidence in scientific knowledge concerning global warming was damaged seriously by a succession of events after late 2009, including the leaking of emails suggesting improper activities by climate change scientists and news reports about erroneous data in the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC).

Under such circumstances, much discussion has been done on the use of science in policy making. In the United States, regulations were drawn up early on regarding the operating process of the National Academy of Sciences and government advisory committees as well as the quality assurance of scientific knowledge used by the government. Under the Obama administration, efforts for ensuring the integrity of science have accelerated. On March 9, 2009, President Obama issued a memorandum on scientific integrity; and then, on December 17, 2010, John P. Holdren, Assistant to the President for Science and Technology, followed up with more specific instructions to executive departments and agencies. Then the Department of the Interior (DOI), the National Oceanic and Atmospheric Administration (NOAA), and other departments and agencies have drawn up their own guidelines.

In the United Kingdom, the BSE problem prompted concerns about the role of scientific knowledge in policy making during the 1990s. Guidelines were created in response; but then after the Home Secretary removed the chairman of the Advisory Council on the Misuse of Drugs in 2009, the UK Department for Business, Innovation and Skills issued the Principles of Scientific Advice to Government on March 24, 2010, setting out rules of engagement between the government and scientific advisers. As shown in Figure 2, the principles clearly stipulate that the government must respect the independence of scientific advisers, while scientific advisers must respect the democratic process of policy making.

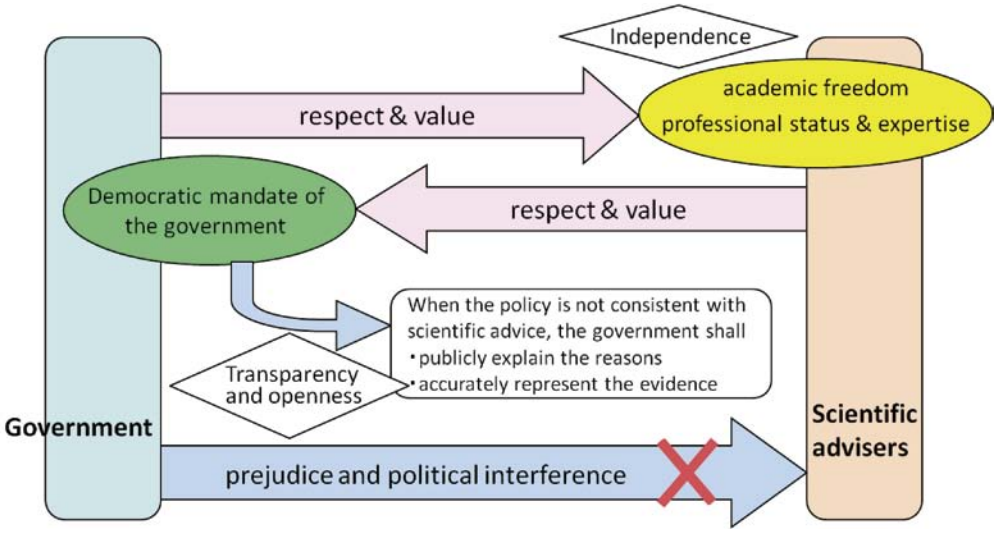

Figure 2. Major points of UK BIS “Principles of Scientific Advice to Government”

In Germany, the Berlin-Brandenburg Academy of Sciences and Humanities (BBAW) in 2008 drew up guidelines on scientific advice to the government. The other national academies, the Leopoldina, which focuses on natural sciences, and Acatech, the engineering academy, have adopted BBAW's guidelines, too. In addition, Acatech drew up its own guidelines in 2010.

In international bodies, too, the role of scientific advice in policy making has been examined. The European Commission laid down guidelines on the collection and use of expertise in 2002. After the International Council for Science (ICSU) conducted an extensive study on the role of scientific advice in the mid-1990s, the InterAcademy Council (IAC) drafted guidelines in 2005. In 2010, IAC, at the request of the United Nations and IPCC, conducted a review of IPCC's activities. IAC is now engaged in a project on "research integrity and scientific responsibility." Of special note in that project is a plan to produce educational materials for the world's scientific community, including principles and guidelines on the responsibility of science, by October 2012. Meanwhile, in the United States, the National Science Foundation (NSF) plans to convene a Merit Review Summit in May 2012 to promote global discussions on evaluation of scientists and scientific integrity.

2.4 Developments in Japan

Until recently, the role of scientific advice in policy making was rarely discussed in Japan; however, it received renewed attention after the Great East Japan Earthquake of March 11, 2011. After the disaster, the government had to make decisions based on scientific knowledge in responding to the earthquake, tsunami, and nuclear accident, issuing evacuation orders, and ensuring food safety. In reality, however, the process was fraught with confusion. This has led to a widespread recognition that Japan needs a better foundation on which scientists and the government can fulfill their proper roles in emergencies.

More and more stakeholders in Japan are thinking that the role of science in policy making, not only in emergencies but also in the everyday operation of the government, needs attention. The 4th Science and Technology Basic Plan, adopted by the cabinet on August 19, 2011, incorporated a statement that "the government shall examine the relationships of science and technology to policy, including issues related to the use of scientific and technological results in planning and promoting policies, from broad-ranging aspects, and draw up basic principles."

The government is also examining the organizational framework for promoting science, technology, and innovation policy. An expert study group, created by the Minister of State for Science and Technology Policy, issued a report on December 19, 2011, calling for the appointment of the Science, Technology and Innovation Advisers (provisional name), the enhancement of the related secretariat and think-tank functions, the improvement of liaison with the Science Council of Japan, and other measures to improve scientific advice in Japan. It also pointed out the need to make rules defining the relationships between scientific advice and political decision making.

The Science Council of Japan is likewise aware of the need to strengthen its scientific advice function. On September 22, 2011, its Executive Council issued a statement "Recovery from the Great East Japan Earthquake and the Responsibility of the Science Council of Japan," in which it noted the importance of providing the government with advice and proposals by integrating the views of the nation's scientific community, and of two-way communication with the public.

Thus, the importance of ensuring the integrity of science-based policy making is earning recognition in Japan, along with the development of an organizational framework for enhancing scientific advice.

2.5 Significance of establishing principles

As the importance of science-based policy making has grown in recent years, ensuring its effectiveness and integrity has become an urgent task. Efforts to deal with this task are accelerating globally. Japan should also begin earnest effort, in liaison with other nations and international bodies.

As the first step toward ensuring the effectiveness and integrity of science-based policy making, various stakeholders should engage in discussion using the draft principles in this proposal as a starting point, and then the principles need to be finalized. As noted above, the 4th Science and Technology Basic Plan requires establishing basic principles on the relationship of science and technology to policy making. Through cooperation of relevant organizations, the principles should be established promptly.

Establishing the principles and related organizations' guidelines, and then implementing them will bring about major progress in ensuring the effectiveness and integrity of policy making in Japan. In other words, the principles will contribute to the promotion of science-based policy making as well as to the enhancement of public confidence in government and scientists, or policy making and science.

Figure 3 suggests a mechanism in which science and technology can play proper roles in the process of policy making and implementation, thereby solving problems faced by society and realizing sustainable development. In this figure, "observing scientists" discover and identify new natural principles and social problems through observation, while "designing scientists" study and propose methodologies and systems to solve such social problems. "Actors" use scientific advices provided by designing scientists to carry out efforts affecting society and nature and realizing innovations to solve social problems. Actors and scientists can have dialogue and discussion with each other to let the cycle operate, and maintain and enhance sustainable society.

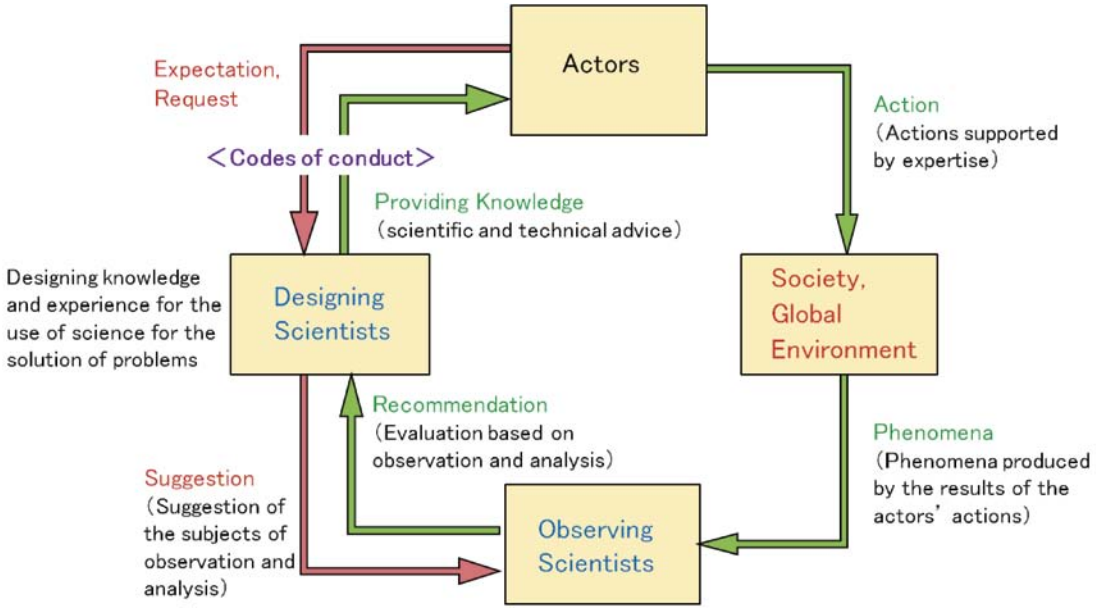

Figure 3. Roles of Actors and Scientists[(1)]

[(1)] Adapted from the figure on the role of scientists in sustainable evolution, shown on p.1 of Hiroyuki Yoshikawa, *Design Methodology for Research and Development Strategy: Realizing a Sustainable Society*, Center for Research and Development Strategy, Japan Science and Technology Agency, 2010.

In order for this cycle of the sustainable evolution of society to function in a sound manner, rules, or codes of conduct which mediate between designing scientists and actors are necessary. The principles and guidelines regarding the roles and responsibilities of science and government in policy making, as called for in this proposal, are also expected to prescribe the relationships between designing scientists and actors. In this case, "actors" means policy makers including both politicians and administrators. Thus, establishing codes of conduct regarding the roles and responsibilities of scientific advisers, as designing scientists, and policy makers, as actors, will lead to a contribution to the sustainable evolution of society.

In addition, participating in discussion with other nations on scientific integrity, which has become a major global issue, will enable Japan to fulfill its responsibility in the international society.

2.6 Significance of laying necessary foundations

To ensure the effectiveness and integrity of science-based policy making, a wide range of initiatives are necessary, along with the government's ongoing effort to set up a proper organizational framework. Such initiatives include: Establishing foundation for using scientific advice properly for policy making in emergencies; making the principles and guidelines widely known and ensuring adherence to them by relevant parties, encouraging relevant discussions in academic societies on the relationships of science and technology to policy and society as a whole; and, in broader terms, fostering a culture for science-based policy making.

The Japanese government is now moving toward the appointment of the Science, Technology, and Innovation Advisers (provisional name), strengthening the related secretariat and think-tank functions, and other measures to ensure the effectiveness of scientific advice. The significance of carrying out the initiatives mentioned above at this time is very large, as they are likely to augment the effectiveness of the government's initiatives.

In carrying forward these initiatives, the understanding and cooperation of all concerned parties, not just the government, will be necessary. The Science Council of Japan, universities, academic societies, and think-tanks which are involved in science, technology, and innovation policy, the media, and the society as a whole should understand the importance of science-based policy making, and promote it from their respective standpoints, while endeavoring to ensure its effectiveness and integrity. It is also important to note that they should recognize that science-based policy making is ultimately for the well-being of the society. (Figure 4)

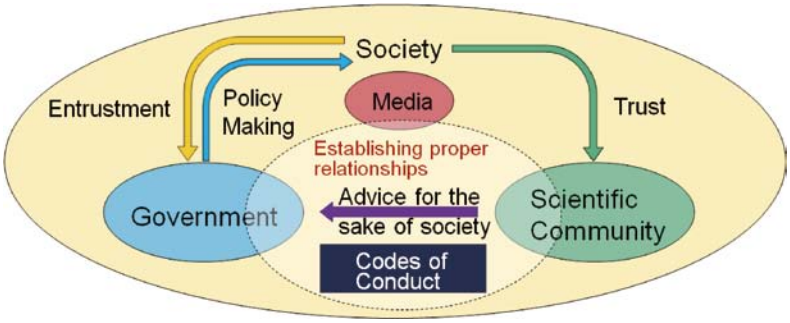

Figure 4. Science-based policy making and society

3. Toward Implementation

3.1 Establishing principles and guidelines

This proposal presents a draft of principles on the roles and responsibilities of science and government in policy making. The draft was formulated by referring to various principles, guidelines, or codes of conduct that have recently been drawn up overseas, while also considering Japan's particular situations. It is hoped that a broad range of stakeholders in Japan will engage in discussion using the draft as a starting point.

The codes of conduct (including principles, guidelines and the like) overseas, which were referred to in formulating the draft principles are varied in nature and purpose. Some of them are intended for scientific advisers including academies and government advisory committees. Others are for ensuring legitimate handling of scientific knowledge in the government. Still others prescribe more generally the science-government relationships. Figure 5 roughly represents the overall structure of the contents of all those codes of conduct.

It is important to note that the codes of conduct dealt with in this proposal are concerned with the role of science in policy making; they do not cover the entirety of scientists' codes of conduct. Other types of scientists' codes of conduct include those regarding general research ethics, bioethics, and medical ethics; there are also codes of conduct regarding scientists' relationships with the industry. Such types of codes of conduct are different in nature and purpose from those dealt with in this proposal. Needless to say, however, ensuring the integrity of science in policy making and ensuring the integrity of science itself are interrelated.

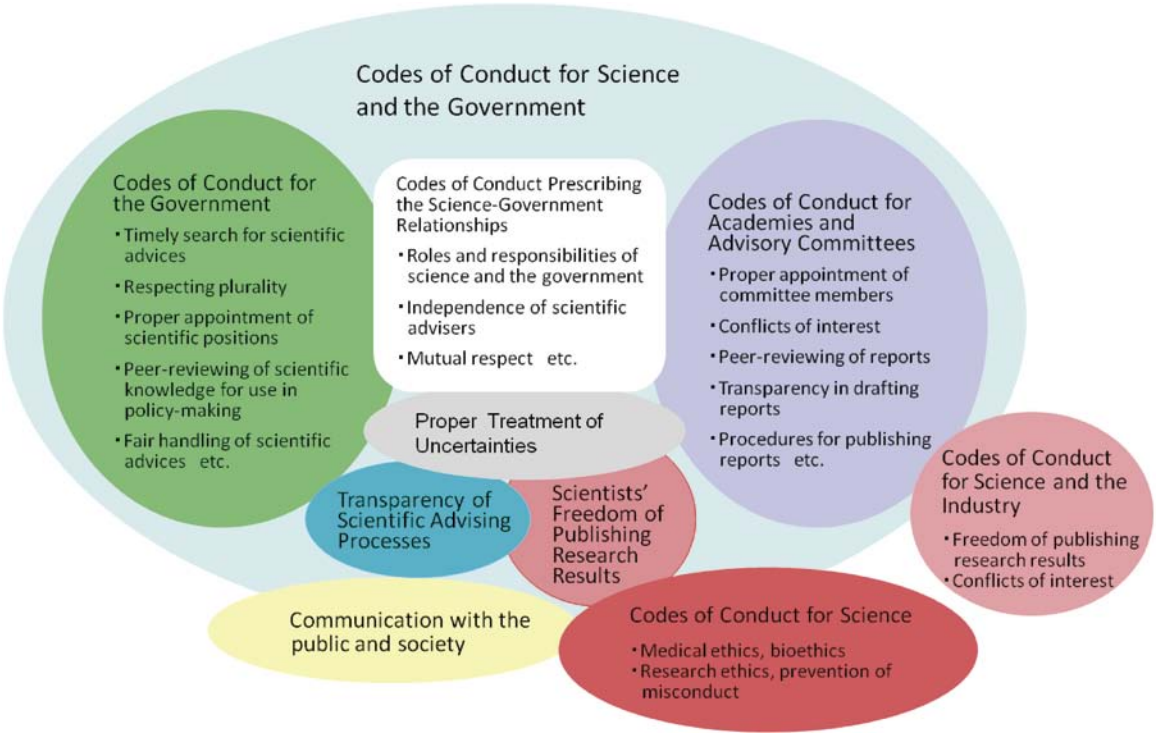

Figure 5. Typology of Codes of Conduct

The draft principles in this proposal were formulated by analyzing and reinterpreting codes of conduct that have been drawn up overseas and also considering the current status of the institutions and systems for scientific advice in Japan. In addition, an item regarding scientific advisers' awareness of their own responsibility was included, in view of the problems seen after the multiple disasters in March 2011.

Figure 6 shows the overall structure of the draft principles. As a whole, the ten items constituting the draft principles cover the roles and responsibilities of both the government and the scientific community, and cover the whole process from the generation of scientific advices to reflecting them onto policies.

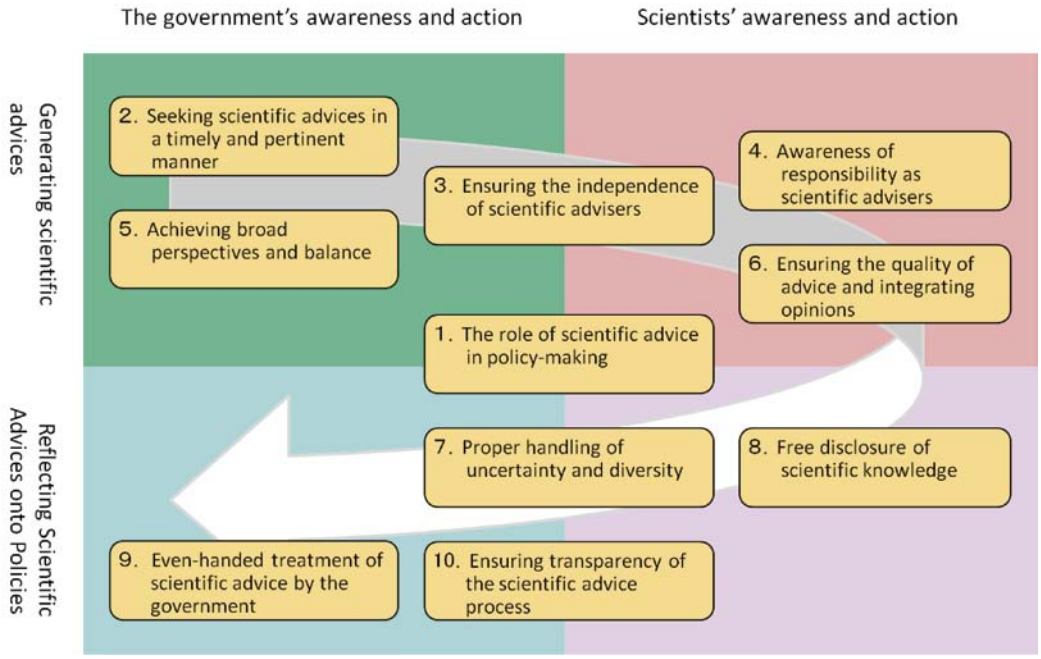

Figure 6. Overall Structure of the Draft Principles

The codes of conduct which have been referred to in formulating the draft principles will be informative as stakeholders will begin discussion to finalize the principles. Of such codes of conduct, major ones are as follows. It will be also important to keep up with relevant efforts overseas, such as IAC's project on "research integrity and scientific responsibility" and NSF's Merit Review Summit in May 2012.

- *The United States* -
  (1) Memorandum by President Obama (March 9, 2009)
  (2) Memorandum by Assistant to the President for Science and Technology John P. Holdren (Dec. 17, 2010)
  (3) Federal Advisory Committee Act (1972, amended 1997)
  (4) Guidelines established by DOI, NOAA, NSF, NASA, EPA, FDA ….. (January 2011 – March 2012)
  (5) NSF, "The Global Merit Review Summit" (May 2012)
- *Great Britain* -
  (6) BIS, "Principles of Scientific Advice to Government" (March 24, 2010)
  (7) Go-Science, "The Government Chief Scientific Adviser's Guidelines on the Use of Scientific and Engineering Advice in Policy Making" (June 2010)
  (8) Go-Science, "Code of Practice for Scientific Advisory Committees" (November 2011)
- *Germany* -
  (9) Berlin-Brandenburgische Academie der Wissenschaften, "Leitlinien Politikberatung" (2008)
- *EU* -
  (10) Commission of the European Communities, "Communication from the Commission on the Collection and Use of Expertise by the Commission: Principles and Guidelines" (2002)
- *IAC* -
  (11) InterAcademy Council, "Rules of Procedure" (2005)

Specific guidelines for ensuring the integrity of science in policy making should be varied, depending on policy fields and types of organizations. It would be difficult to draft guidelines that can cover all policy fields or those that can be applied to all of the diverse organizations and individuals.

For this reason, in foreign nations, it is often the case that general, overall principles are first established and then specific guidelines are drafted by individual organizations. For example, in the United States, John P. Holdren, Assistant to the President for Science and Technology, made public common principles on ensuring the integrity of science in the federal government first, and then DOI, NOAA, and other federal departments and agencies drafted their own guidelines.

Likewise, the draft principles presented in this proposal are intended as basic principles that should be commonly required to ensure the integrity of science-based policy making in general. It is hoped that organizations involved in science-based policy making will start considering about their own guidelines, bearing in mind the image of a possible system of codes of conduct shown in Figure 7.

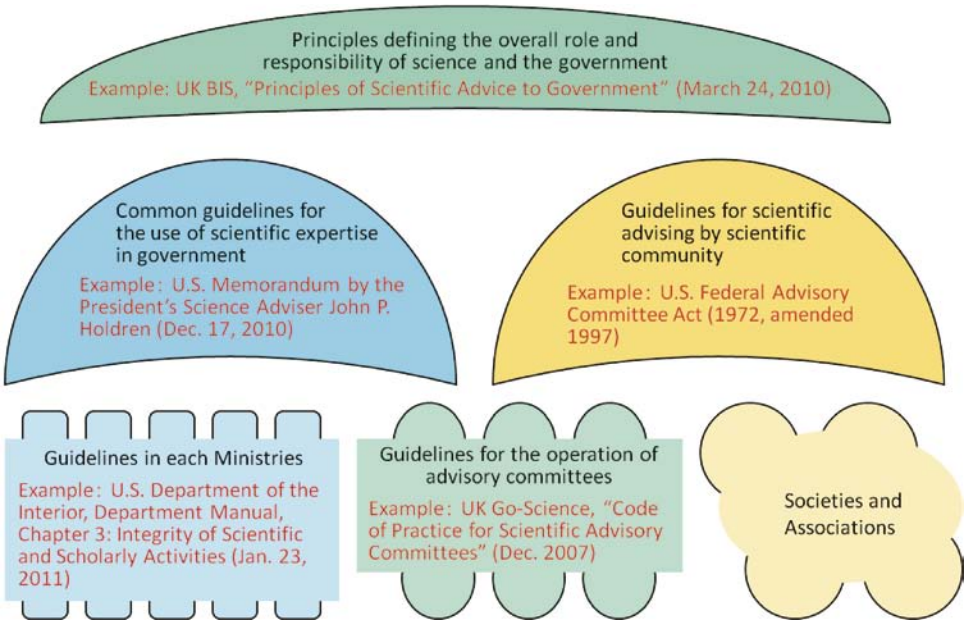

Figure 7. A Possible System of Codes of Conduct

In discussing science-based policy making, the fundamental goal is to build a robust system of linking the scientific community and the government. In pursuing that goal, it is important to understand that science and policy making operate based on continuous yet different values. (Figure 8)

Figure 8. Continuous yet Different Values of Science and Policy Making[(1)]

(1) Excerpted from materials by Kevin D. Crowley, used in a symposium "Role and Responsibility of Scientists in the Response to TEPCO Fukushima Nuclear Power Plant Accident," held on November 26, 2011.

3.2 Laying necessary foundations

As Japan aims at ensuring the effectiveness and integrity of science-based policy making, it is important to lay proper foundations for it, with the understanding and cooperation of a broad range of stakeholders, in addition to the government's current effort for setting up organizational and institutional frameworks through the appointment of the Science, Technology, and Innovation Advisers (provisional name), the enhancement of the related secretariat and think-tank functions, and so on. Specifically, the following initiatives are important.

(1) Establishing a foundation for scientific advice in emergency situations

Various problems have been pointed out in regard to the nation's recovery effort from the Great East Japan Earthquake and the Fukushima Daiichi Nuclear Power Station accident. Scientists with diverse opinions made comments inconsistently in the media on such issues as radiation exposure standards and food safety, and in some cases created confusion among the public. Relevant scientific societies and the Science Council of Japan did not have access to critical information, and failed to be systematically involved in the national effort. There were occasions in which scientists who were in positions to make scientific advices acted in ways that could aggravate confusion. Such problems have posed the question of how to ensure the government's access to effective scientific advices in emergencies.

In emergency situations, scientific advice can affect the fate of numerous human lives and determine the magnitude of economic and social impacts. The government and scientists have the responsibility to secure reliable scientific knowledge within a limited amount of time and reflect it on the government's decision-making. The foundations which enable that are sorely needed.

a. Organizational and institutional arrangements

In the United Kingdom, there is a unique system for securing effective scientific advice in emergencies. In emergencies, the Government Chief Scientific Adviser organizes a Scientific Advisory Group in Emergencies (SAGE). In recent cases, SAGE was organized at the time of influenza epidemic in 2009, the eruption of an Icelandic volcano in 2010, and finally the Fukushima Daiichi Nuclear Power Station accident in 2011. SAGE's mission is to produce coordinated, consistent scientific advice in a timely manner, and presents it to the government.

The Science, Technology, and Innovation Adviser (provisional name), which the Japanese government is currently considering to set up, is meant to be effective in coping with emergencies. It is necessary to design as early as possible the detailed organizational arrangements under the Science, Technology, and Innovation Adviser (provisional name).

b. Establishing a foundation that enables response to emergencies

In order to effectively mobilize scientific expertise in emergencies, elaborate preparation must be done. For example, it would be effective to construct and maintain a network of key scientists; that is, to categorize accidents and disasters that could lead to the loss of many human lives or have large social impacts, and construct a systematic network of experts corresponding to those accidents and disasters. By referring to such a network in emergencies, it would be possible to identify appropriate scientists quickly and secure the readiness to cope with emergencies.

(2) Ensuring implementation of the principles

In ensuring the effectiveness and integrity of science-based policy making, it is necessary not only to establish principles regarding the roles and responsibilities of science and government in policy making but also to secure their enforcement by promoting the following initiatives under cooperation of a wide range of stakeholders.

a. Disseminating the principles

Once the principles are established, they should be made known as widely as possible, by securing the cooperation of academic societies, universities, etc. In addition, opportunities for training should be set up by those organizations to promote understanding of the contents of the principles. The government, for its part, should consider how to support such initiatives.

b. Ensuring adherence to the principles

Some mechanism should be created to confirm the commitment of scientists to the principles when they assume positions to provide scientific advice. For example, such confirmation could be requested at the time scientists notify their affiliated organizations of such appointments. Or, such confirmation could be made when government ministries make such appointments.

c. Disseminating and ensuring adherence to the guidelines drafted by relevant organizations

It is hoped that, in response to the formulation of the principles, individual organizations involved in science-based policy making will draw up their own guidelines. Efforts for disseminating, and ensuring adherence to, such guidelines need to be promoted, just like the principles.

In the United States, guidelines drafted by government organizations include stipulations regarding the protection of whistleblowers on the loss of scientific integrity. The introduction of a similar mechanism could be considered in Japan as well.

The efforts for disseminating, and ensuring adherence to, the principles and guidelines will require the close cooperation of the relevant organizations, such as government ministries, the Science Council of Japan, academic societies, and universities and research institutes.

d. Initiatives by the media

While the role of the media in policy making is outside the scope of this proposal, the relationships of the media, scientists, and the government also exert profound impacts on policy making and society as a whole.

For example, the United Kingdom undertook a pioneering initiative in which the British Broadcasting Corporation (BBC) was evaluated on its scientific coverage by the BBC Trust (the governing body of BBC). The report published in July 2011 by the BBC Trust included many recommendations, such as distinguishing established facts and opinions clearly and referring to a wider range of views by external experts.

It is hoped that, in Japan, too, the importance of the role of the media in policy making is more widely recognized and relevant discussion is done. The scientific community and the government should be prepared to actively cooperate and contribute to such discussion.

(3) Fostering a culture for science-based policy making

As Japan will promote science-based policy making, it will be necessary to ensure that relevant parties and the public fully recognize its importance. At the same time, it will be important to create a forum to discuss and raise awareness of the issues related to the relationships of science and technology to policy and society. To attain such objectives, following initiatives should be promoted.

a. Fostering discussion in academic societies

In order to raise awareness of the issues related to the relationships of science and technology to policy and society among scientists in various fields, opportunities for discussion should be set up on such occasions as the annual meetings of academic societies.

Such discussion should be promoted in liaison with relevant international efforts, considering the fact that the role of science in policy making has become a critical issue in the global community.

It is also important to create a forum for scientists and policy makers in all fields to cooperate with each other and deepen discussion. In considering the creation of such a forum, the American Association for the Advancement of Science, for example, can be referred to as a model.

b. Appointing officials and creating sections in charge by relevant organizations

In promoting the efforts to lay foundations for science-based policy making in Japan, it will be effective for relevant organizations, including government ministries, the Science Council of Japan, academic societies, universities, and research institutes, to appoint officials and, where necessary, create sections in charge of efforts related to the relationships of science and technology to policy and society. In the United States, for example, many executive departments and agencies have appointed their “scientific integrity officers.”

It could be also meaningful to set up a cross-organizational association as a forum for the interaction of those officials, and thereby strengthen a network that would enhance Japan’s efforts as a whole.

c. Education on the relationships between science and technology and society

Raising awareness of the issues related to the relationship between science and technology and society among the next generation of scientists as well as the public at large is an important investment for the future. Education on such issues should be enhanced, not only in higher education but also in primary and secondary education.

The government is now moving toward the appointment of the Science, Technology, and Innovation Advisers (provisional name) and the enhancement of the related secretariat and think-tank functions, among other measures. Enhancing education on the relationships of science and technology to society is an important step from the viewpoint of the development of human resources that would support such think-tank functions.

In order to enhance the society’s proper understanding of science-based policy making, it is particularly important that scientists and the government have discussion with society on the risks of science and technology and share recognition of it. For this reason, it is important to promote risk communication and education on the uncertainties associated with scientific knowledge as well as the risks of science and technology.

Study Process

- July 2010 — Interim Report “Codes of conduct for science and government in policy making - Current status in and outside Japan”
- May 2011 — Report “Ensuring the integrity of science and codes of conduct for policy making”
- May 30, 2011 — Exchanging views with Sir John Beddington, UK Government Chief Scientific Adviser, and others at a symposium
- July 2011 — Visiting the United Kingdom and exchanging views with people in relevant organizations
- Sep. 2011 — Visiting Germany and exchanging views with people in relevant organizations
- Oct.1, 2011 — Exchanging views with Sir John Beddington, UK Government Chief Scientific Adviser, Philip Campbell, Editor-in-chief of *Nature*, and others at a symposium
- Oct. 4, 2011 — Exchanging views with John Boright, US NAS Executive director for international relations
- Oct. 5, 2011 — Exchanging views with Bruce Alberts, Editor-in-chief of *Science* and others at a symposium
- Oct. 6, 2011 — Discussion with the Council for Science and Technology Policy
- Oct.13, 2011 — Exchanging views with David Cope, director of the UK Parliamentary Office of Science and Technology
- Oct. 25, 2011 — Workshop on scientific advice in policy making
- Nov 7, 2011 — Exchanging views with Jane Lubchenco, director of US NOAA, and others at a symposium
- Nov. 20, 2011 — Symposium on scientific advice in policy making at Science Agora 2011
- Nov. 26, 2011 — Symposium “Role and responsibility of scientists in the response to TEPCO Fukushima Nuclear Power Plant Accident”
- Jan. 27, 2012 — Discussion with the Executive Council of the Science Council of Japan
- Feb. 24, 2012 — Workshop on the roles and responsibilities of science and government in policy making
- Feb 29, 2012 — Discussion with the Council for Science and Technology
- Mar. 22, 2012 — Discussion with the Council for Science and Technology Policy
- Mar. 31, 2012 — Finalizing the strategic proposal

In the study process of this proposal, many people have made vital contributions by offering valuable suggestions and information, giving lectures in seminars, and in various other ways. We sincerely thank for their cooperation.

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Strategic Proposal

Toward the Establishment of Principles Regarding the Roles and Responsibilities of Science and Government in Policy Making

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