

Third Year of 9th Term Research Committee

Research Report on International Affairs,  
Global Environment and Food Issues

(Excerpt)

*Global Water Issues  
and Japanese Foreign Policy Strategy*

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Research Committee on International Affairs,  
Global Environment and Food Issues  
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## **Preface**

Water is a precious circulative resource, which is indispensable not only to maintain human life and health but also to conserve the ecosystem and continue socio-economic activities. Water also serves as an important strategic resource for humans because water resources are unevenly distributed around the world and the usable amount is limited.

At present, around the world, more than 700 million people are in an unstable water environment due to increased population, increased food demand, advanced urbanization and industrialization, climate change and other factors. It is expected the number will reach one billion in 2050. Water shortage causes food shortage and famine. In addition, due to disease from unsanitary water, many people are in poor health. Water issues also trigger international conflicts, such as conflicts over water resources in the Aral Sea region and other border-crossing river basins. In recent years, water disasters have occurred frequently mainly in Asia, for example, the flood in Thailand in 2011. These disasters have not only adversely affected people's living and the economy in disaster-affected communities but also had serious impacts on the world economy due to the disruption of supply chains of global companies. How to prevent water disasters and, if any occurs, how to reduce damage have become major international issues.

The international community has now recognized, through efforts by the United Nations, G8 and other developed nations, NGOs and other organizations, that water issues are important global-scale issues affecting the security of human beings. Water issues have cross-cutting characteristics and, for this reason, it is essential for every nation to make concerted efforts using their expertise in various fields to solve them.

In response to the move in the international community, Japan has been contributing to addressing water issues around the world using its outstanding knowledge, technology and experience related to water, such as water purification, sewage treatment and seawater desalination. Its efforts include the promotion of integrated water resources management, establishment of an innovative water circulation system, and support of water use for food production. Japan is also giving a consideration as an agenda to address water issues through business activities in water resources-related markets, which are expanding globally. Furthermore, it is promoting international cooperation towards the "mainstreaming disaster risk reduction," including the provision of a comprehensive "disaster readiness package," consisting of both hardware and software, that is aimed to prevent and reduce water disaster.

Through strategic implementation of these efforts, Japan can ensure its sustainable growth while displaying its presence in the international community and exercising

leadership in solving problems. According to this recognition, the research committee conducted earnest research on the theme of “Global Water Issues and Japanese Foreign Policy Strategy” for this term. This report, which covers major findings from the three-year research, includes the “Issues and Recommendations” section, based on various opinions expressed from committee members and experts.

## I Background and Deliberation Process

Research committees of the House of Councillors are bodies established to carry out long-term and comprehensive research relating to basic issues of state administration. Focusing on a specific research theme, each research committee hears the views of voluntary testifiers and others and engages its members in open discussions. With this mission in mind, the Research Committee on International Affairs, Global Environment and Food Issues was established on November 12, 2010, in the midst of the 176th session of the Diet, to conduct long-term and comprehensive research into international affairs, global environment and food issues.

While international affairs, global environment and food issues are very wide-reaching, water was identified as one of the common interrelated issues. Therefore, the research committee decided to deal with the water issues in its first year, proceeding with the investigation by seeking the views of experts, etc.

As a result, the following findings were acquired:

- World water issues might worsen due to various factors such as population growth, rising food demand, progress in urbanization and industrialization and climate change.
- Water issues are cross-cutting in nature, and the key to their resolution lies in the mobilization of the knowledge and wisdom of the international community in diverse areas.
- It is very important for Japan to contribute to the resolution of water issues by making the best use of its knowledge, technologies and experience, in order to enhance its presence and leadership role in the international community, as well as to ensure its prosperity.

In the view above, we decided to continue dealing with water issues for the second year and onward, and set a research theme of this term as “global water issues and Japanese foreign policy strategy,” on August 31, 2011. In the second year, we proceeded with the investigation mainly on Asia, one of the regions most prone to water-related issues where water-related disasters occur frequently. Through interviews and a free Q&A session to seek views and explanations from experts, practitioners and government testifiers, and committee members’ visits and study tours to related sites, it was revealed that, in order to maintain sustainable economic growth in Asia, it is essential to appropriately address water issues and respond to water-related disasters; and that, in terms of prosperity in Asia, including Japan, it is important for Japan to contribute to addressing water issues mainly through international cooperation using proper technology based on the understanding of the actual circumstances and needs in each region.

In contributing to solving global water issues through international cooperation and other means, it is essential that Japan address its domestic water issues appropriately and accumulate sufficient experience and knowledge. In addition, in consideration of the fact that Africa and the Middle East are faced with water issues, such as lack of access to usable water resources and safe water, more severely than any other regions in the world, it is important for this Research Committee to identify the current state of efforts made by Japan and issues faced by Japan in addressing water issues in these regions. In the final year of the research, therefore, it was decided to deal with water issues in Japan, Africa and the Middle East. It was also decided to conduct research in a diversified and comprehensive manner on the current state of efforts and issues associated with water issues, and future directions, to conclude this three-year research project. In the research, interviews were performed four times to gather views and explanations from a total of 22 experts, practitioners and government testifiers, along with a free Q&A session. Committee members also exchanged their views.

## **II Issues and Recommendations**

Through the three-year research on the theme of “Global Water Issues and Japanese Foreign Policy Strategy,” the research committee has concluded that, recognizing that global water issues may continue to worsen over time, it is extremely important for Japan to contribute to addressing global water issues in the fields of international cooperation, business and disaster risk reduction by making the best use of its outstanding findings, experience and expertise related to water. Such efforts will not only ensure the sustainable prosperity of Japan but also contribute to global stability and prosperity, and eventually ensure the presence of Japan in the world and enable the country to take a leadership role.

Based on the conclusion above, the committee has identified “issues and recommendations” to promote Japan’s efforts for the solution of global water issues, which are shown below:

### **1. Basic Knowledge about Water Issues**

#### **<Issues>**

Securing water, a source of life, is one of the most fundamental needs for human beings. In today’s highly-developed civilized society, however, we are faced with a great variety of water-related problems. Water resources are distributed very unevenly on the earth: There are many regions under water stress where water shortage threatens people’s survival and economic activities and others. Conflicts over water have also been reported. There is a concern that, in the future, water shortage and other water-related problems could worsen in these regions due to increase in water demand caused by increasing population and economic development and others, worsening of water quality, climate change, and other factors. Around the world, mainly in the Monsoon Asia region, torrential rains and long-lasting rainfall events have caused water-related disasters, to damage seriously to lives and properties of local residents. These rainfall events also gave damage to supply chains of companies, leading to significant adverse effects on the global economy. As these examples show, in order to achieve the stability and prosperity of the world today, it is inevitable to respond to water issues as important challenges appropriately.

In Japan, despite the fact that the amount of water resources per capita is less than the world average, few people are well aware of water issues because water seems to be abundant due to the relatively high precipitation in the country. In recent years, however, flood damage from torrential rains, water shortage, lowered levels of groundwater, water pollutions and other water-related problems due to various factors such as climate change

have occurred. In order to address these problems effectively, each one of us in Japan should recognize the importance of addressing them as their own problems.

In the international community, as a result of rapid globalization, there has been consensus that water issues are major global issues. In response to this consensus, Japan needs to address them appropriately, in cooperation with the international community, with due consideration of the influence of water issues in other countries around the world on Japan. Japan depends on imports for a large amount of its food and energy needs. For this reason and in order to maintain supply chains established by Japanese companies throughout the world, mainly in Asia, it is essential to secure a stable supply of water and to be prepared for water disaster at each local site. While water is a strategic resource, it is extremely important to be involved in solving global water issues in terms of guaranteeing our own security. From this viewpoint, it is important for Japan to strategically address water issues.

Taking food for an example, because agricultural water accounts for about 70% of the total global water demand, if water shortage increasingly become serious globally due to various factors such as increased population, economic development, urbanization and climate change, it is expected that food production will be adversely affected. This example clearly shows that global water issues threaten the survival and prosperity of Japan, a nation depending on imports for many of its food supplies. It is therefore important for Japan to take these issues seriously.

Water issues are present in various forms throughout the world. In terms of the scale of population, the impact on the global economy, and the close relationships with Japan, water issues that most urgently need to be addressed are those particularly in Asia. According to the Asian Development Bank (ADB) and other sources, India, Bangladesh, and six other nations in Asia are faced with the most serious issues related to the stable supply of safe water and the preparedness for water disasters, followed by 29 other nations, including China and Vietnam. Since many Japanese companies are doing business in these countries, that supply Japan with parts and other products, how to address Asian water issues is also significantly important to Japan.

### **<Recommendations>**

○Water, which is indispensable for human beings, plays an important role in supporting the economy of Japan in that it is not only closely related to food and energy but also essential to maintain supply chains established by Japanese companies throughout the world. Even in Japan, which is said to be abundant in water, more regions could be

affected by water shortage, deteriorated water quality and, furthermore, water disasters due to various factors. More efforts therefore should be made to educate people that water, which can be said a strategic resource, is extremely important to achieve the sustainable growth of Japan as well as global stability and prosperity.

○In Japan, both the government and the private sector possess outstanding knowledge, experience and technology that are necessary to address water issues, such as world-class highly sophisticated water and sewer technologies and water disaster-related expertise. In the circumstances where there are concerns over the worsening of water issues, it is essential for Japan to make the most of these advantages so that it can take a leadership role in addressing global water issues. Its contribution to global stability and prosperity through ensuring the security of human beings will allow Japan to establish a strong position in the international community as well as to achieve its own sustainable prosperity. The government and the private sector should share this recognition.

○Based on this shared recognition, Japan should develop clear strategies for foreign policy for addressing global water issues and demonstrate the nation's intention to be involved in addressing these issues from a long-term perspective. In developing strategies, it is important to ensure the balance between the perspective of international cooperation undertaken from the humanitarian viewpoint that safe water is indispensable to all people and the perspective of business that contributes to the economic prosperity of Japan.

○Efforts to address global water issues should focus particularly on Asia from the perspective that water risk reduction is urgently needed considering the following factors: the worsening of water issues is more concerned in Asia than in other regions; the importance of Asia in the global economy is more and more increasing; and the impact of water risk on Japan's economy through multi-layered supply chains formed by Japanese companies mainly in Asia.

## **2. International Cooperation in Water Issues**

### **(1) Promotion of multinational cooperation in efforts to address global water issues**

#### **<Issues>**

In the international community, as a result of globalization, there has been consensus

that water issues are major global issues. In response to this consensus, efforts within the frameworks of the cooperation between major countries, including the United Nations and major countries' summit meetings (G8 Summit) and within the private sector framework, such as the World Water Forum, the Asia-Pacific Water Summit and the International Water Association (IWA) as well as within other diverse frameworks. Japan has been active in contributing to enhancing these multinational cooperative efforts: At the World Water Forum, it presented the "Initiative for Japan's ODA on Water" in the third forum in 2003 and the "Water and Sanitation Broad Partnership Initiative (WASABI)" in the fourth in 2006; At the Hokkaido Toyako Summit in 2008, water issues were included as major issues on the agenda. Japan is also moving forward with cooperation within such frameworks as the "U.S.-Japan bilateral Clean Water for People Initiative" launched in 2002 and "Japan-France Water Sector Cooperation" in 2003. Since steady continue efforts are essential in addressing water issues, it is important to enhance multinational cooperation on a continuous basis.

### **<Recommendations>**

○In promoting multinational cooperation, Japan should lead discussions to help participating nations share the recognition that it is important to achieve a sustainable and healthy water cycle, taking into account various aspects and interrelationships of water issues. It is also important for Japan to propose effective actions, including bilateral cooperation programs such as Official Development Assistance (ODA) and effective cooperation with foreign nations, international organizations, international NGOs, and other third parties. In particular, support for regional programs such as the Asia-Pacific Water Summit should be enhanced by using Japan's knowledge and experience effectively and based on its achievements in cooperation programs in the past.

## **(2) Achievement of the Millennium Development Goals (MDGs) and Post-MDGs**

### **<Issues>**

The Millennium Development Goals (MDGs) adopted by the United Nations are important indicators for the international community in supporting the development of developing countries. It is also essential to achieve MDG targets in order to ensure the security of human beings. One of the MDG targets is to improve the water and sanitation sector. The targets for universal access to safe water have so far been achieved on a global

level, but there still remain more than 700 million people who have no access to safe water mainly in the sub-Saharan African and South Asian regions. It is important for us to face this fact.

In developing countries, mainly women and children spend many hours collecting water, which is one of the factors that deprive them of opportunities for economic independence and education. In addition, water collected with such difficulty is unhygienic and serves as a cause of the spread of infection. Based on these facts, it is understood that about one third of MDG targets can be achieved if access to safe water is ensured. For this reason, water issues should be prioritized.

The deadline for the MDGs is 2015 but it is necessary for us to continue our efforts in the future. At present, discussions on post-MDGs are ongoing. Because water issues involve many areas of development, the central issue in these discussions is how to set targets for managing water resources and multi-aspect water issues, including water-related disaster, based on findings accumulated in recent years.

### **<Recommendations>**

○Water issues are important in the development of developing countries. In order to ensure the security of human beings, it is important to make continuous efforts to improve access to basic sanitation in delivering the MDGs. In the post-MDGs after 2015, new more comprehensive targets focusing on water issues should be set and a system that ensures desirable results should be established. In this process, how to follow up achieved results should also be discussed. Japan should fully assume its leadership role in achieving these objectives.

○The MDGs target to reduce the number of people without sustainable access to safe drinking water by half by 2015 was achieved in 2010 in the world as a whole but it seems difficult to achieve the target in the sub-Saharan African region. Without achieving the MDGs target, it is not easy to ensure poverty reduction and high quality growth in Africa. In the 5th Tokyo International Conference on African Development (TICAD) held in June this year, Japan should assume its leadership role to help participants share the recognition that it is important to address water issues in order to ensure the development and poverty reduction and to promote international cooperation through support and business efforts both by the government and the private sector, leading to specific results.

### **(3) ODA in the water area**

#### **<Issues>**

Placing high importance on the water and sanitation sector in the ODA, Japan has long been active in providing assistance in this sector and is currently the top donor in the world. In order to maintain its presence in the international community, it is necessary to fully contribute to improving the water environment in developing countries, which is one of the most urgent issues. To ensure this contribution, it is important for Japan to accurately understand the current states in each region and each country, such as supply and demand trends, the state of water quality and other water-related issues, systems and measures for the prevention and mitigation of water disasters, and needs for assistance so that it can provide higher-quality assistance through ODA programs by making full use of its knowledge, experience and technology.

However, due to tight financial situation, budgets to ODA have been repeatedly cut. It is therefore also important to strategically use limited financial resources by taking into account the appropriateness and effects of each project in terms of impacts on the overall global water issues and the relationships between Japan and recipient countries.

To improve the water supply in developing countries, long-term assistance that widely ranges from the protection of water resources to the installation and maintenance of water supply facilities, is required. In this respect, it is important to send technical staff specializing in water supply in villages and waterworks management, members of the Japan Overseas Cooperation Volunteers (JOCV), and volunteers to the site so that they can offer continuous assistance in cooperation with local residents. While it is necessary to ensure access to safe water and use the water appropriately in using sanitation in order to prevent infection, many of the developing regions and countries do not have such practice. It is therefore also necessary, in addition to installing water supply facilities, to install clean sanitation and encourage local residents to make a habit of using sanitation and washing hands before eating. In order to promptly install sanitation, which are urgently needed, it is important to apply methods suitable for local circumstances, including the distribution of septic tanks or other individual sewage disposal systems.

In the future, it is expected that global needs for water systems where highly sophisticated water use systems, such as those for sewage recycling and seawater desalination, are integrated and further optimized, and regional integrated water systems will increase. In this respect, it is important for Japan to propose specific technologies and systems to achieve a water cycle that is suitable for each region while assisting the development of the entire region from a long-term perspective, instead of merely providing assistance to individual projects separately, mainly in countries that have reached a certain level of development.

## **<Recommendations>**

○For effective and efficient ODA implementation in the water and sanitation sector, it is important to appropriately operate and maintain facilities and equipment provided under ODA. There are however some cases where facilities and equipment, particularly those provided for free, have been abandoned and left unused after failures. To avoid such cases, in implementing ODA projects, assistance to maintenance and following up to check the status of use should be strengthened.

○For sustainable and effective assistance in the water and sanitation sector to ensure the independence of the recipient country, new international cooperation models that fulfill the three criteria of sustainability, affordability, and ownership and incorporate a social business strategy should be introduced.

○Considering the fact that there are the poorest of the poor who truly need assistance in developing countries and that, in particular, water-related issues directly affect people's life, conventional types of grants should be implemented in appropriate combination with a social business.

○Circumstances surrounding water issues in developing countries are diverse and wide-ranging. For this reason, long term and broad range of assistance is essential to improve the situation of water supply. Efforts should be made to make Japan's assistance truly useful to each recipient country and to help local people maintain, manage appropriately and use in a sustainable way, water supply facilities provided through an assistance program. Such efforts include the sending of technical staff specializing in water supply in villages and waterworks management, members of the Japan Overseas Cooperation Volunteers (JOCV), and volunteers to the site; the procurement of materials and other resources required for projects from local sources as much as possible; and discussion and cooperation with local residents.

○In order to improve access to safe water and promote the dissemination of sanitation in developing countries, it is important to provide education, through dialogue and interchange with local residents in a step-by-step manner, to help local residents understand the importance of using clean sanitation and washing hands to prevent infection and to encourage them to make a habit of doing such activities. It is also

necessary to support increasing sanitary and hand washing facilities through dialogue with local residents and in cooperation with them.

○In the development of developing countries, in order to place the most emphasis on addressing water issues and, instead of addressing them separately, it is necessary to consider what would be a desirable water cycle in the comprehensive context of developing a city and a region.

#### **(4) Importance of NGO's role**

##### **<Issues>**

To appropriately address water issues around the world, on-site, long-term, carefully planned efforts are essential. Many Japanese NGOs have been providing assistance for local residents on a grassroots level in developing countries. Their efforts are well-recognized as a part of the development assistance by Japan. In order to implement our assistance in the water sector more effectively and efficiently, it is important for the Japanese government and NGOs to strengthen their cooperation both in the planning and implementation of such policies.

NGOs' assistance efforts on a grassroots level not only help publicize Japan's efforts but also provide direct benefits to local communities because they can respond promptly and flexibly to local needs. Despite these advantages, people in Japan do not fully recognize the roles played by NGOs. In addition, donation culture is not yet well-established in Japan. For these reasons and more, many NGOs' financial foundation is fragile and the number of permanent staff is limited. It is therefore necessary to provide NGOs with appropriate assistance to help them solve these problems in order to make the best use of NGOs.

##### **<Recommendations>**

○The Government currently provides financial assistance to NGOs. However, there is an opinion that it is necessary to improve the Government's scheme because recipients are mandatorily required to submit excessively detailed reports on the purposes of use of funds that do not take into account local circumstances, despite the fact that external auditing is made. It is recommended that this kind of scheme be improved to make it easier to use and that more assistance measures be made available in order to enhance assistance to NGOs' flexible and agile efforts by taking into account the roles NGOs are

playing in efforts to address global water issues and the current status of assistance received by each country.

○It is necessary to establish a new system and improve the operation of current systems in order to incorporate results from dialogues on policies with NGOs as well as to develop more effective policies.

### **(5) Promotion of rainwater use**

#### **<Issues>**

Asia is one of the regions where water issues are becoming more serious due to increasing population and economic development. Since the Monsoon Asia region has one of the highest precipitations in the world, rainwater has high potential as a water resource. In Southeast Asia and South Asia, there are areas where, despite its abundance, groundwater cannot be used for drinking purpose due to arsenic and other pollution. In these areas, the importance of rainwater as a water resource is particularly high. It is therefore important to provide assistance to promote its use.

In addition, there is an increasingly high risk of water disasters, such as flooding, caused by heavy rainfall due to impacts of climate change or other factors. Particularly in urban areas, it can be expected that the promotion of rainwater use would control the sudden flow of rainwater into rivers and subsequently reduce urban flooding. It is therefore important to provide assistance in terms of the prevention of water disasters.

#### **<Recommendations>**

○Rainwater is naturally distilled water. It is safe and anybody can collect it easily. In addition, due to increased demand for water, the issue of how to allocate water between agriculture and industry will be raised. For these reasons, in the Monsoon Asia and other regions where a certain amount of precipitation can be expected, it is recommended that rainwater be positioned as one of small-scale, dispersed, the major water resources in international contribution efforts through international cooperation and business and its use be spread.

## **3. International Cooperation in Water Disasters**

#### **<Issues>**

Many water disasters occur in the world. The mega-tsunami that hit Japan and floods

in Thailand in 2011 are still fresh in our memory. Water disasters that destroy people's life in the blink of an eye and take away all the properties can be said one of the most serious threats to the security of human beings. Statistically speaking, the population affected by water disasters in Asia accounts for 85% of the population affected by all natural disasters in the world. In addition, as globalization progresses, the tsunami and floods mentioned above significantly affected industrial production and other economic activities on a world-wide scale. As shown by these statistics and facts, cooperation in water disaster preparedness and prevention in the Asian region is extremely important to ensure stability and prosperity not only within the region but also in the world.

Water disaster is a threat also to Japanese companies that operate supply chains globally, mainly in Asia. They need to assess, manage and address water risk, including supply and value chains.

Japan has accumulated a wide variety of excellent technology, knowledge and experience through its long history of fighting against water disasters, such as tsunamis, monsoonal heavy rains and typhoons. Japan, which achieved modernization earlier than any other nations in Asia, has developed flood control measures based on scientific knowledge. In the process, it also experienced limitations and contradictions in these measures. How to convey and share what Japan has accumulated, including what it has learned, with other countries, mainly in Asia, that suffer water disasters is an important issue for Japan. In developing countries, people in different regions and countries have different ways of thinking about disaster risk reduction and mitigation, and the level of consideration toward development also differs. It is therefore also important for Japan to consider what role it should play in promoting the concept of "mainstreaming of disaster risk reduction," which places emphasis on disaster risk reduction and mitigation, in development and other projects in the future.

### **<Recommendations>**

○International cooperation in disaster risk reduction is essential to ensure the security of human beings, on which Japan places high importance. Japan should include disaster risk reduction as one of the major issues in its efforts to promote international cooperation and assist the promotion of the "mainstreaming of disaster risk reduction" in the development in developing countries. More emphasis should be placed on promoting assistance using the "disaster readiness package," a combination of personnel, products and expertise, which was developed after the recent flood in Thailand.

○Japan has a variety of knowledge and technology related to disaster risk reduction. Among them, a sophisticated radar system using satellite for detecting meteorological phenomena that may cause water disasters and the accumulation and use of data obtained from the system serve as advantages for Japan. With these advantageous features, Japan should further promote assistance to countries mainly in Asia that are vulnerable to water disasters in improving their capabilities for disaster risk reduction and response through international cooperation in developing and providing a flood forecast and warning system, developing human resources, and other activities, which are implemented by the International Center for Water Hazard and Risk Management (ICCHARM) and other organizations.

#### **4. Japan's Role in International River Basin Management**

##### **<Issues>**

Water is essential to maintain and develop society, including people's life and economic activities, as is shown by the fact that ancient civilizations developed along large rivers. Hence, there have been repeated conflicts over water since ancient times. Even today, after international systems have been established by sovereign nations, it is an important issue to balance interests between countries along international rivers, particularly when many countries are involved, from the viewpoints of the conservation of the environment in surrounding areas, the proper use of resources, as well as the prevention of conflicts between nations.

In the world there are some major international rivers along which there is potential tension between countries over the use of water, and such tension sometimes comes out. Under the concern over the worsening of water shortage due to increasing world population, economic development, and forest reduction and degradation, some people have expressed their concern, saying, "The 21st century will be the era of water conflicts." After the Cold War, fear and negotiations on water between nations have rapidly increased. While most of them are said to have been friendly, some say that we should not be optimistic about the future. Therefore, how to develop a framework for cooperation on international river issues is important.

One of such rivers in Asia, the region closely related with Japan, is the Mekong River. Some say that there is the possibility that the conflict over the river could become tense between China in the upper reaches, which is planning to construct many dams, and countries in lower reaches. Because the Mekong River basin is important for the stability

and prosperity in the Indochina Peninsula and closely related to Japan in various aspects, it is important for countries in the basin to balance their interests smoothly.

As an organization to balance conflicting interests, there is the Mekong River Commission (MRC). However, it is suggested that the coordinating capacity of the MRC has been decreased. In the changing regional situation, such as the change in the power balance, how to contribute to achieve a smooth balancing of interests is an important issue to Japan.

With regard to the Aral Sea in the Central Asia, which has been shrinking remarkably, it has been said that there are tense relationships between countries in the upper reaches and those in lower reaches over the water management of the Syr Darya and Amu Darya rivers, the main water sources for the Aral Sea, as a result of the independence of surrounding countries following the disorganization of the Soviet Union, which played a role as a coordinator for water resources, energy and other issues. Japan should also consider what it can do in assisting the development of countries in the Central Asia.

In the Middle East, it should be noted that it has been said that the use of water in the Tigris and Euphrates rivers is one of factors for international conflict.

Because Japan is not a country directly involved and, with no international rivers and lakes, it has little experience in balancing conflicting interests over them. For these reasons, it is considered difficult for Japan to make direct contribution. It is therefore important for Japan to make the best use of its advantages, such as its neutral position as a third party, excellent observation technology for water resources, and expertise in forest management to improve the watershed cultivation function.

### **<Recommendations>**

○While it is difficult for Japan to directly coordinate interests of countries involved so as to solve problems of countries in an international river basin, proactive efforts should be made to contribute to the stability and prosperity of countries in the region concerned, for example the Mekong region. In planning such efforts, the importance of the region to Japan should be taken into consideration and advantages of Japan, such as trust relationships built over years with riparian countries and expertise in river management based on scientific data, should be used effectively. With these advantages, Japan may take initiative in helping them develop minimum international standards and rules that riparian countries should comply with, help build a transportation infrastructure in these countries, and offer support in developing specialists in water control technology, forest

management, and other areas of relevant expertise.

○One of the factors causing tensions over the management of international rivers is the difference in the recognition of the current state of water resources among nations involved. More efforts should be made to provide objective satellite data and to assist in establishing an observation network. Since it is meaningful to offer opportunities for scholars and others concerned to discuss the current state of water resources in order to reach a common recognition, efforts through other than diplomatic channels should also be made.

○To facilitate the water management in the Aral Sea basin, it is important to strengthen a sense of unity among countries surrounding the sea. With this in mind, Japan should express its view that it is desirable for countries in the Central Asia to unite and work together through opportunities such as the “Central Asia plus Japan” dialogue proposed by Japan.

## **5. International Contribution through Water Business**

### **(1) Importance of water business**

#### **<Issues>**

It is no more possible for ODA alone to address global water issues, which need urgent action, because of the limited financial resources. For this reason, it has been noted that, in order for Japan to ensure sustainable international contribution, it is important to consider making use of private funds and expertise. The global market for the water business is expected to further expand in response to the increasing population and economic growth in developing countries. Reflecting this expectation, it has been said that an opportunity has arrived for Japan to build win-win relationships with these countries through addressing water issues with its valuable experience and highly advanced technology related to water treatment. In this context, working out how to develop the water business in the future is important.

There are also different views as follows: Even with excellent water-related technology, it is difficult for a private sector organization alone to enter a water and sewer market because many of the water and sewer markets in the world are in the public sector, and, even if it can, when considering the fees for water and sewer services in the market, it is not easy to make sufficient profits.

Japan has a high level of water-related technology in general, such as membrane

treatment technology. However, due to “Galapagosization,” meaning that the standards for Japanese technologies are too specific to domestic use to be used overseas, Japanese companies are superior in technology but inferior in business. It is therefore important to consider how to change this situation.

Japan has a long history of efforts to improve water and sanitation issues and has accumulated a diversified range of technologies, which is an advantage to the country. In particular, technology for septic tanks is effective option for the improvement of sanitation issues, which needs to be urgently addressed in developing countries where it is not feasible to construct a large-scale centralized sewerage system due to financial difficulties and other reasons. The promotion of business to make such technology widely available should also be considered.

### **<Recommendations>**

- Since many countries place high trust in Japan, the country should actively promote the water business using its technological strengths, funding ability as well as Soft Power, including the Japanese sense of ethics, while also using the “Japan brand.” In water markets in developing countries, while making profits, it is also important to emphasize the viewpoint to contribute to promoting industry in each country by helping water-related companies grow and cooperating with them.
- In conducting the water business in foreign countries, it is necessary to develop business strategies that make the best use of highly advanced technologies of Japanese companies, such as water leak prevention technology, the operation and maintenance of purification plants and sewage treatment plants, seawater desalination, and sewage recycling. At the same time, because economic development stages differ from country to country and from region to region, it is also important to pay careful attention to differences in the water quality and water supply systems that are needed.
- Japan has accumulated a diverse range of technologies from highly-sophisticated cutting-edge technologies, such as membrane treatment, to small-scale distributed water treatment technology using rough filtration, water treatment facilities using slow sand filtration (ecological purification system), joint wastewater treatment tanks and water purification agents. Japan also has expertise in sanitation systems that use excreta as a resource without using water, such as composting toilets and bio-toilets. Japan has the advantage of such accumulation over emerging countries. Japan should provide appropriate technology that meets the needs of local residents depending on the circumstances in recipient region and country.
- In order to make the best use of Japan’s excellent water-related technologies in developing the water business, the national and local governments, companies,

universities, NGOs and other organizations in Japan should make concerted efforts on a nationwide basis. It is also necessary to make those involved aware that they are not doing business on a domestic level but on a global level. To enhance their awareness, a wide range of technologies and human resources should be gathered from around the world into Japan and Japan should make more efforts made to enforce business performance that leads to the success of sales promotion activities by top-level people.

## **(2) Government's efforts in overseas water business**

### **<Issues>**

It is said that, in promoting international cooperation by making the best use of Japan's strengths in the field of water, efforts made by private companies with highly advanced technology for water treatment and other water-related issues through their business have become important as well as ODA and other international cooperation programs. However, it is difficult for private companies alone to accept and fulfill orders for infrastructure projects, such as water and sewer, in which the public sector, such as the national and local governments of the ordering country. In order to use excellent technologies owned by private-sector organizations more widely, how the Government assists them will be an important issue.

In addition, in implementing large-scale infrastructure management projects, there are a variety of risks, including political, financial and public security risks. It is therefore essential to provide assistance to reduce these risks.

Overseas countries should not be generalized as having the same needs. Their needs for water vary greatly. It is therefore necessary to consider what strategies should be adopted by the Government and how to assist water business, including not only large scale water and sewer infrastructure projects but also the dissemination of simple water treatment facilities using water purification agents and individual water treatment systems such as septic tanks.

### **<Recommendations>**

○ In implementing water and sewer projects in foreign countries, the Government should cooperate with private companies and local governments to help companies present their technologies and products at international conferences and international trade fairs in order to make widely known the high level and the superiority of Japanese technologies. The Government should also further promote dialogues and negotiations with partner countries on the occasion of dialogues between governments and top-level people. Some developing countries may have difficulty in setting appropriate water and sewer rates due

to their domestic circumstances. Therefore, it is necessary for the Government and the private sector to cooperate to strongly promote dialogues with partner countries toward establishing a system that allows sustainable operation. In coordinating the development and implementation of a project with the partner country, Japanese government offices abroad, and local offices of the Japan International Cooperation Agency (JICA) and the Japan External Trade Organization (JETRO), and other organizations involved should closely cooperate to accurately identify needs and issues so that they can provide necessary assistance.

○It is often not easy for overseas water business to be financed by a loan from private financial institutions for reasons such as a long payout period and the involvement of the local government. Therefore, the Japan Bank for International Cooperation (JBIC) and other government institutions should increase financial assistance by loans and other forms of finance to companies that intend to start business so as to promote the development of overseas water business. When a company receives an order for a water supply system abroad, it takes a long period of time from the receipt of the order to the completion of the facility and there often are various risks associated with it. For this reason, it should be recommended that companies start overseas water business in the form of joint investment or other collaborative arrangements using financing by the Innovation Network Corporation of Japan (INCJ).

○In conducting business abroad, there are various risks associated with it, which include, in addition to political and financial risks as mentioned above, natural disasters, such as droughts, floods and earthquakes; diseases such as infections; security threats, such as crimes, terrorism and civil wars; and conflicts between the countries concerned and their neighboring countries. For this reason, when assisting a company to enter an overseas market, the Government should carefully ensure cooperation between organizations involved and appropriately provide local risk information to the company. It is also important for the Government to strengthen cooperation with the company to ensure the safety. Each company should undertake its necessary risk management and should be prepared for unforeseen events so that it can respond appropriately.

○The scope of overseas water business is extensive and wide-ranging. The Government should not stick to the volume zone of water and sewer systems and should further promote business assistance in a more comprehensive manner, including water ionizers, water purifiers, and bottling.

○The Government should develop a clear national policy on a comprehensive water business that Japan should promote, including the construction of Smart City, which is being promoted in developed and emerging countries, and strategically assist overseas business development by companies. In these efforts, it is important to assist the effective

use and management of water after it is supplied. The government should clearly take the viewpoint that it assists community building as a whole by providing expertise and guidance on production activities that make use water effectively, such as cascade use of water, water-saving agriculture, water recycling within a plant.

○In July 2010, in a UN resolution on the human right to water and sanitation, it is declared that safe and clean drinking water and sanitation is an essential human right. This reflects the fact that more people consider it necessary to review water issues in response to a move to use water as a product for profit. In this light, it is necessary to take measures that take into account that access to safe and clean water is a right for all.

### **(3) Overseas development of water-related projects by local governments**

#### **<Issues>**

In Japan, water supply and sewerage business has long been operated by local governments. For this reason, technology, experience and expertise related to this business field accumulated in Japan are mostly owned by local governments. In the field of water supply, for example, Japan has technology and expertise that can contribute to addressing global water issues, including technology for producing high-quality directly-drinkable water, technology for operating and maintaining water conduits to minimize water leakage, and expertise in fee collection to achieve a low rate of non-revenue water. It is also true, however, that local governments are now required to make efforts to ensure the sustainability of the business because of concerns about the decreasing number and aging of staff, which affect the succession of technology to future generation, and the shrinking market due to the decreasing population and the spread of water-saving and other devices.

In recent years, in response to these issues and because of expectations for the activation of local economy by expanding local small to medium-sized water-related companies in overseas markets, some local governments have started their efforts to expand water supply and sewerage business in overseas markets through cooperation with private companies or using the “third sector method.” Based on the recognition that the dissemination of the high quality water supply systems, which Japan boasts of, will contribute to the development of developing countries from long-term perspectives, it has been suggested that it is important to assist such efforts made by local governments as mentioned above. In particular, considering that water issues occur throughout the water cycle, it is necessary to address issues comprehensively, taking into account the entire region and water basin, instead of installing water supply and sanitation merely to address individual issues. In this context, it is necessary to actively use experience of local governments in comprehensive community development. Japan also has a history of

overcoming water pollution caused by droughts and environmental pollution through cooperative efforts between the government and the private sector, which is the most persuasive evidence for the effectiveness of Japan's technology and expertise. In addition, expectations from developing countries are also high. Local governments, therefore, should play a more leading role.

In developing overseas water business, local governments should give consideration to the following facts and opinions: the profitability of water business is not high; as a result of using local materials and human resources in order to make water supply fees low enough for local residents to afford, the business does not help increase local employment; it is not appropriate to cover a deficit, if any, with taxpayer money; once a project is started within the framework of international cooperation, even if it fails to succeed, it would not be appropriate for the project to be withdrawn because it would be undesirable in terms of international relations.

### **<Recommendations>**

○Recognizing that excellent water supply and sewerage-related technology and expertise in operation and management possessed by local governments contribute to addressing global water issues, the Government should improve assistance, including advice and guidance, on local governments in their developing water business in overseas markets. In such efforts, the Government should not only assist individual projects but also cooperate with local governments from the viewpoint of assisting community development in such a way to address water issues in a comprehensive manner through political dialogues with the partner country.

○Efforts in water business by local governments should be promoted with emphasis on the significance of the business as international contribution, the conservation of expertise that is necessary to maintain water business, and the result of human resource development, under sufficient risk assessment and management and without impeding their own primary business. In these efforts, it is important to recognize that water business involves various risks and that it is difficult to make high profits because it is necessary to protect people's living in the partner country, and understand that the objective of water business by local governments is to promote the public welfare.

○It is important for local governments to accumulate overseas experience while ensuring stable income from consulting services and business management contracts in order to minimize risks. Efforts should be made to develop projects where the construction of facilities is funded by an ODA grant and Japanese water-related industries can easily participate. In promoting such efforts, local governments and JICA should cooperate. When full-scale entry is decided, local governments should promote cooperation with

private companies, INCJ and other relevant organizations.

○When local governments develop overseas water business, they should provide residents in their area of jurisdiction with full explanation of the necessity of the business and other relevant issues, including risks, so as to gain their understanding.

#### **(4) International standardization of water-related technologies**

##### **<Issues>**

The achievement of international standardization of technologies is meaningful for the country that possesses them in their efforts to disseminate them. At present, the international standardization of water-related technology is entering an important phase. In this context, Japan should promote international standardization of its technologies because the international standardization of its advanced water treatment technologies will contribute to solving water issues faced by the entire world from a long-term perspective and also serve as an advantage to Japan's water-related industry to expand its overseas business.

Since international standards are not exclusive, in the face of intensive international competition, it is difficult to ensure the superiority of relevant industries of Japan only by achieving the international standardization. We should recognize that the achievement of international standardization is merely a means. Based on this recognition, the capacity of plan-making is needed so as to propose ideal water-cycle systems, and contribute to addressing global water issues, using internationally standardized technologies. How to implement these creative plans is the important issue.

##### **<Recommendations>**

○Nationwide efforts should be made strategically to develop international rules in such a way as to promote international standardization by making the best use of the advantages of Japan's water-related industries. In the process of rulemaking, in order to eventually allow the dissemination of comprehensive water-cycle systems that take advantage of the superiority of Japan, including the application to Smart City, a strategy that takes into consideration the post-achievement of international standardization should be developed through close cooperation between industry, government and academia.

#### **(5) Assistance to water-related BOP business by small and medium-sized companies**

##### **<Issues>**

In recent years, some developing countries have achieved steady economic growth,

showing potential to be promising markets in the future. In response, BOP business targeting the low income group, or the BOP segment, which accounts for the largest portion of the population in these countries has been attracting people's attention. Companies aim to improve the living standards of local people and ensure continuous increase in revenue by offering products and services at appropriate prices to people in the BOP segment. In BOP business, it is said that the key to success includes flexible and detailed measures and the drastic use of local human resources and local people's ideas. Because these are the strong points of small and medium-sized companies, they can play an active role in this business area.

Some of the small and medium-sized companies in Japan have excellent water-related technology and expertise, such as sewage treatment. Due to the shrinking domestic market, many of them cannot expect better future prospects with domestic business development alone and are suffering under a harsh economic environment. Through BOP business, they can contribute to addressing water issues faced by developing countries by offering products and services using technologies of each of these companies and, at the same time, can expect increased profits and stable business. It is therefore important to consider how to assist them in entering BOP business. It is also important to enhance assistance in terms of development because BOP business promotes the independence of local people and contributes to poverty reduction through creating employment opportunities.

### **<Recommendations>**

- Even small and medium-sized companies possessing technology that is effective in addressing water issues in developing countries often have difficulty in expanding their business in overseas markets by themselves, because of lack of staff capable of working overseas, little overseas business experience, their low name recognition in foreign countries, lack of local information, and few connections with government officials in partner countries. In order to lead BOP business by small and medium-sized companies to a success, more government-private sector cooperative efforts should be made to assist BOP business, including, in addition to financial assistance from ODA and other frameworks, detailed assistance, including public relations activities and logistics, by Japanese government offices abroad, and local offices of the Japan International Cooperation Agency (JICA).
- In developing BOP business in developing countries, in addition to government assistance, efforts by companies are also needed, which include the identification of local needs and the setting of prices affordable by local people. In doing so, those involved should promote the use of local human resources and materials, which is the intent of

BOP business, and have a viewpoint that they should contribute to local labor markets and economy.

## **6. Water Issues in Japan**

### **(1) The importance of water infrastructure management in Japan**

#### **<Issues>**

In Japan, the water infrastructure, including water and sewer facilities, was mainly developed in the post-World War II rapid economic growth period. While the infrastructure coverage percentage is high now, many of them have deteriorated, causing the increasing number of accidents such as leakage and collapse of sewer pipes. Therefore renovation is urgently needed. Another issue needing to be addressed is the financial state of water supply companies that is worsening because of decreasing population, the spread of water-saving devices and other factors. In order to secure financial resources, it is necessary to establish a new system to use private funds as financial resources. Cooperation between government and private sector is also needed to promote the development of water infrastructure. In these efforts, the current situation different from the one during the period of the rapid spread of water and sewer facilities, such as the emergence of *Genkai shuraku* or depopulated marginal villages, should be taken into account. With this in mind, the appropriate selection between conventional large-scale centralized sewerage systems and small-scale scattered ones should be made.

In Japan, local public enterprises are engaged in water supply and sewerage business. Many of the business for sewage systems and small water utilities adopt cash basis government accounting instead of accrual basis corporate accounting. It has been noted that one of the issues that need to be addressed in securing funds for renovation is the accounting without depreciation.

#### **<Recommendations>**

○In order to ensure the financial sustainability of water supply and sewerage business, it is necessary to consider to change the accounting system of local public enterprises into a corporate accounting system and the adoption of new methods to use private funds that are more open than local bonds. As for the urgently needed renovations of deteriorated facilities, financial and other necessary assistance should be considered.

○It is also important to extend the lifetime of existing facilities. To do so, more efforts are needed to include the point of view of disaster risk reduction and to disseminate and expand the concept of asset management that promotes more efficient operation and maintenance of water-related infrastructure and contributes to ensuring regional safety

and security to create a stable region. In addition, it is urgently needed to address issues associated with the entire water-related service such as water and sewer issues in the period of decreasing population and water demand, irrigation in industry and agriculture, and flood control, instead of setting a high value on population growth, increased water demand, and other growing aspects of society.

## **(2) The importance of strengthening of the water supply-related operational base**

### **<Issues>**

In local government, as a result of mass retirement of employees in the baby boom generation and the progress of rationalization, a decrease in the number of water service engineers has become a serious concern in terms of ensuring the sustainability of water service. If private resources are not used appropriately in the future, the water service would fail. This issue should be carefully addressed.

### **<Recommendations>**

- Water supply plays an essential role in protecting human life. It is necessary to consider how to allocate roles appropriately to the government and the private sector and how to effectively use excellent technologies of private companies, on the premise that the public sector controls the core part of water supply services and takes the final responsibility.
- In some *Genkai shurakus* with depopulation due to a decline in births and an increase in the elderly populations and other factors, water supply facilities are self-operated and maintained by villagers because local governmental functions have weakened but the entry of private companies cannot be expected because of unpromising financial situations. In the future, it may become more difficult to operate and maintain water supply facilities in these villages. Therefore, it is necessary to consider how to operate water supply services and more assistance should be provided.

## **(3) Improvement of food self-sufficiency rate**

### **<Issues>**

While there is a worldwide concern about water shortages, Japan greatly depends on imports to supply food, which requires a large amount of water for its production. Japan imports a large amount of food produced mainly in the United States, Australia and China. Some of the areas in these countries where the food imported by Japan is produced are suffering from water shortages. It is noted that in terms of global water balance, it is very inefficient for Japan, which has relatively sufficient water reserve, to import a large

proportion of food consumed in Japan from other countries suffering water shortages, instead of producing necessary food within Japan, so the appropriateness of this inefficiency should be discussed.

It has also been noted that, amid a concern over worldwide shortages of water and food due to increasing population and economic growth mainly in developing countries, Japan should make more efforts to increase food production in order to increase its own food self-sufficiency rate. Some people point that through these efforts, Japan can contribute to addressing global water issues and fulfill its duty as a member of the world community.

With all above taken into account, Japan should consider what efforts should be made to increase its food self-sufficiency rate in the future.

### **<Recommendations>**

○Farmland, particularly paddy field, has a variety of functions, such as water resource and contribution to the biodiversity. In considering what form of food self-sufficiency would be desirable, a comprehensive standpoint, including the values of these diversified functions possessed by farmland, which is the production base, should be incorporated. In addition, water demand to rise as a result of increased production of food in Japan, including the amount of water to be needed and how to secure the water needed, should be carefully identified.

○From a long-term perspective, it is expected that the balance between water and food supply and demand will become tighter globally. Some say that, if trade in agricultural products is more liberalized on a global basis, exports could be concentrated on specific countries and furthermore prices could easily rise due to export controls and influx of speculative funds. It is also said that there is a concern that imported food produced using unsanitary water may threaten the safety of food. Japan should make efforts to improve its food self-sufficiency rate with these concerns in mind and from the standpoint of improving the global water balance.

## **(4) The importance of proper forest management**

### **<Issues>**

Forests, accounting for about two thirds of the land area in Japan, have the economic value of timber production as well as various public functions such as water reservoir function, leveling of river flows, and CO<sub>2</sub> absorption. To maintain these functions, owners of private forests must manage their forests appropriately. However, there are forests that have been abandoned as a result of a decline of the forestry industry because

of the sluggish prices of domestic timber. In some cases, it is difficult to identify the owner of a forest after it has been repeatedly inherited and/or sold. In terms of securing stable water resources, how to promote the conservation of forests and the development of the forestry sector should be considered.

In order to ensure the well-planned forest management and the public functions of forests are fully executed, it is important to clearly identify forest owners, as well as to ensure the implementation of measures to perform tree thinning, forestation and other activities that are required when owners are unknown. It is also important to ensure the implementation of measures based on the Forest Planning System, such as the promotion of the development of a forest management plan. Efforts should also be made to help those involved follow procedures related to change in ownership due to buying and selling, inheritance, and other reasons, appropriately and fairly; and help local governments and other parties smoothly understand and use information on forest owners and other relevant information. It is important to fully incorporate the intent of the Forest Act revised in 2011 into the Government measures to develop and implement appropriate measures.

#### **<Recommendations>**

○In order to maintain the water-resource and other functions of forests, appropriate forest management, such as tree thinning, is essential. In this context, it is necessary to promote the forestry industry itself and the self-supply of timber by promoting the use of timber from thinning and other measures. In addition, under the current stagnation in the forestry industry, it is important for relevant organizations to take administrative measures to ensure that forest owners fulfill forest management duties appropriately. Such measures include the promotion of the use of Forestland Ownership Notification System under the revised Forest Act and the sharing of information on ownerships; and the performance of duties on behalf of owners for the purpose of forest conservation. If it is difficult to ensure forest conservation even if these measures are taken, it is necessary to deliberate the necessity of more measures.

○Based on the appropriate assessment of the versatile functions of forests, the possibility of providing financial support to regions that contribute to securing water through the management and conservation of water source forests should be considered.

### **(5) The importance of the management of information on groundwater**

#### **<Issues>**

Groundwater has been one of the most important water sources in Japan. In recent

years, there has been an increasing demand for bottled water due to increasing interest in tasty water and other reasons. As a result, in some areas, such problems as lowered levels of groundwater due to excessive pumping are reported. With the intention to save water charges and, following the Great East Japan Earthquake, to use it as an emergency water source, increasing number of large-scale water consumers are installing wells for their own use. This has raised a concern about an impact on water supply service of local governments. How to address these issues should be considered. In addition, some companies are considering relocating their overseas production sites back to Japan because of a concern that the water shortage in Asian countries with a rapidly growing economy may affect their production. If they do so, it is expected that the use of groundwater will increase in Japan, to which careful attention should be paid.

In the center of Tokyo and other areas where ground subsidence occurred due to excessive pumping of groundwater in the past, as a result of the legal regulation of groundwater intake, the groundwater level rose again. However, this has caused new problems, such as raised underground structure. It has been noted that, in terms of diversifying water sources and achieving water use that does not depend on rivers, it is necessary to promote the use of groundwater based on the accurate understanding of the actual status of groundwater.

### **<Recommendations>**

- In Japan, land owners are allowed to freely use groundwater in their premises within the relevant laws and regulations. However, excessive use of groundwater affects extensive areas, causing ground subsidence, depletion of water sources, and other problems. The Government, therefore, should take necessary measures to ensure sustainable use, taking into account the public nature of groundwater. In its efforts, the Government should gather detailed information to make a map of nationwide groundwater veins and use it for the management of groundwater, and also discuss deeply appropriate use of groundwater.
- Comprehensive rules for using groundwater, including preservation of groundwater in food production areas using paddy field, which leads to the improvement of food self-sufficiency, and use and preservation of groundwater by companies, should be developed for each region.

## **(6) Establishment of a basic law concerning water administration**

### **<Issues>**

Since water issues are extensive and wide-ranging, many government ministries and agencies cooperate with each other to address them in accordance with an individual law

that governs each issue. How to deal with water issues differs from law to law and therefore it is sometimes difficult to effectively address water issues with a longitudinal approach, instead of cross-sectional approach. How to address such issues is important.

### **<Recommendations>**

○There are ongoing discussions among member of the non-partisan Diet Members' Association for Water System Reform, aiming to enact the Water Cycle Basic Law, which specifies basic items needed to promote comprehensive water administration and address water issues effectively, such as the characteristics of water, how water should be used, and the development of basic policies of the Government. The Diet and the Government should provide assistance and cooperation that are necessary to accelerate these moves.

○The use of rainwater is effective in addressing the diversification of water sources and floods in urban areas. In addressing worldwide water issues, it is meaningful to accumulate technologies and expertise in Japan. In this context, the Diet and the Government should make more efforts to enact legislation to promote the use of rainwater at an earliest possible time.

## **7. Infrastructure Improvement to Address Global Water Issues**

### **(1) Improvement of domestic systems to address water issues**

#### **<Issues>**

The water cycle is complex and affects all aspects of social systems. For this reason, comprehensive cross-cutting efforts are essential to appropriately address problems in the water cycle. This viewpoint is necessary in contributing to addressing water issues in the world through international cooperation and business. In Japan, because there are many government ministries and agencies that deal with water issues, and water-related laws are implemented individually, the key to effectively addressing water issues is cooperation between ministries and agencies. However, this system does not work properly due to the absence of the “control tower” and other reasons. Therefore, in order for Japan to appropriately address water issues in and outside of Japan, it is important to establish a system that enables different ministries and agencies to make more cooperative efforts.

In Japan, water supply systems have been damaged frequently due to large earthquakes and other disasters. The current emergency disaster response systems should be reviewed and, if necessary, improvement should be made.

### **<Recommendations>**

○In order to improve overall water-related policies of the Government, such organizations as the headquarters for water-related policies should be established as the “control tower” under the Cabinet to develop basic water-related policies including strategies for addressing global water issues, implementation plans and other rules as well as to discuss about the centralized water administration organization and management of budgets.

○In government efforts in international cooperation and assistance to water business to address water issues in the world, it is most important to build trust relationships with the partner country’s government. In addition, the development of policies and, in implementing these policies, quick decision making and appropriate measures are essential. In order to promote centralized implementation of external water policies including international cooperation and water business, the efforts of the entire government should be closely coordinated through related ministerial meetings and other occasions under clearly defined strategies. It should be considered establishing a system that helps implement external strategies for water issues by assigning the minister for water strategies who is engaged in dialogues with overseas policy-makers and build connection with those involved in relevant issues, and plays a leadership role in implementing external strategies.

○In efforts to address global water issues, it is important to make frequent opportunities for exchanging information and opinions between the government and private companies so that they can strengthen their cooperation. In addition, NPOs, political leaders, academic experts and other specialists should play more active roles in filling in for what the government cannot cover.

○Japan is promoting assistance using the “disaster readiness package.” In order to accomplish this activity, it should first of all consider how Japan’s disaster risk reduction system should be. Following the Great Hanshin-Awaji Earthquake, an emergency disaster response system for water supply involving 100,000 staff was established. The Great East Japan Earthquake occurred when the number of staff decreased to 50,000. How the system functioned then should be thoroughly investigated.

### **(2) Promotion and use of science and technology essential in solving water issues**

#### **<Issues>**

One of the factors causing water issues is the divergence of the water cycle formed by global-scale climate systems from the inherent state due to various activities of human beings. Water issues are thus caused by multilayered factors mutually affecting each other.

In order to address these diversified cross-cutting issues, it is necessary to deal with them as a whole. To do so, it is important to promote the establishment of a system that enables to perform a comprehensive study by combining expertise and knowledge in a wide variety of relevant science and technology fields, including, in addition to individual technologies such as fresh water generation and water purification, hydrology, climatology and urban engineering.

The quality of tap water in Japan is significantly high and, in most cases, tap water is used for drinking without any treatment. It is said that there are hardly any other countries in a similar situation in the world. Recently, interest in health and the safety water have been increasing in Japan. As a result, highly sophisticated water purifying technology, other technologies that further enhance the quality of water, and products using such technologies, such as water purifiers attached to a faucet, are attracting people's attention. How to promote these high technologies and make good use of them in order to contribute to solve global water issues should be considered.

#### **<Recommendations>**

○More efforts should be made to promote scientific technologies that are necessary to achieve the ideal water system suitable for each region that contribute to addressing water issues and to systematically combining these technologies. Such efforts include purification of surface water, groundwater and contaminated water such as sewage, seawater desalination, prevention of water disasters, minimization of disaster damage, pursuit of water good for health, impacts of climate change on the water cycle, agricultural production using less water, and establishment of efficient water circulation systems using IT.

○Advanced water technologies are one of Japan's strengths. Careful consideration should be given to how to further enhance its water-related technologies, how to develop these technologies around the world, and how to make good use of them in addressing water issues, in such a way as to avoid "Galapagosization" of these technologies due to lack of clearly defined water strategies of the Government. In these efforts, it is necessary to make strategic efforts, including the concept of reverse innovation, where technologies used to solve problems in developing countries are also used in Japan and other developed countries, after deploying the most suitable technology without sticking to conventional facilities such as water and sewer infrastructure, by taking into account the diversity of global water issues, and by reviewing the entire water technologies possessed by Japan.

### **(3) Promotion of the development of specialists in the water area**

#### **<Issues>**

Japan's technologies for operating and maintaining water supply and sewerage systems are outstanding in the world. At present, however, many of the engineers of local governments who have been engaged in water supply and sewerage projects have reached the retirement age, leading to a concern over the depletion of human resources. While it is necessary to increase the number of water service engineers, it is said that there are not many young people who are attracted to water-related technical jobs. If this situation is left unaddressed, it may significantly adversely affect the supply of safe water and the effective sewage treatment in Japan as well as the superiority of Japan in the field of water. It should therefore be considered how to make water-related technical jobs more attractive and how to increase engineers.

There are also many natural disasters in Japan. In order to prevent disasters and address post-disaster needs, many specialists and engineers in civil engineering and other relevant fields are required. However, the construction industry has recently been shrinking due to decrease in public works and, as a result, the number of specialists and engineers in civil engineering is also decreasing. It is therefore necessary to consider how to secure required staff.

#### **<Recommendations>**

○Effort should be made to have more people informed that jobs as engineers supporting water supply services in Japan are superior to those in any other countries in the world and very attractive. It is also necessary to place emphasis on increasing the number of students who acquire water-related technologies at universities and other institutions. In addition, in order to effectively use developed specialists, generalists who can overlook water-related policies, technology and education in a cross-sectional manner are necessary. A generalist training course should be provided by universities and other institutions so as to develop generalists systematically. Efforts should also be made by the national and local governments and other institutions to hire or use these qualified generalists in order to improve the foundation to address water issues comprehensively.

○It is necessary to develop specialists in disaster risk reduction in a well-planned manner in order to meet the demand for renovation of aged degraded infrastructure, in which people have shown increasing interest since the Great East Japan Earthquake and other disasters. This effort is also needed to make cooperation in disaster risk reduction, one of the important pillars of Japan's international cooperation in the future.

### **III Summary of Third Year Deliberations (Omitted)**

#### **Conclusion**

The Research Committee on International Affairs, Global Environment and Food Issues was established in November 2010 to conduct three-year research on water issues. Water is a precious resource essential not only to the maintenance of the life and health of human beings but also to ecosystem conservation and socio-economic activities, and, at the same time, serves as a strategic resource. It is closely related to food and energy that are also essential to human beings. In recent years, water issues have become increasingly important in the international community. With focus on these understandings, research was started. In the first year, committee members deepened their recognition of the importance of water issues. They considered that it would be significantly meaningful to continue their research in the second and later years to identify the current state of global water issues and what efforts Japan should make. In August 2011, the Committee decided to conduct research in this term under the theme of “Global Water Issues and Japanese Foreign Policy Strategy.”

Efforts made by Japan to contribute to addressing global water issues, which are getting more and more serious, include the promotion of comprehensive management of water resources, establishment of an innovative water circulation system, and support of water use for food production. In these efforts, Japan uses its outstanding knowledge, technology and experience related to water, such as water purification, sewage treatment and seawater desalination. Japan also addresses water issues through business activities in water resources-related markets, which are expanding globally. Its efforts are also focused on international cooperation to prevent water disasters and reduce damage from water disasters under the concept of “mainstreaming of disaster risk reduction,” which puts emphasis on disaster risk reduction and mitigation in development. As a result of these efforts, a certain level of result has been achieved but there are also many issues that still need to be addressed. This research has convinced the Research Committee that the Government’s future efforts should be focused on promoting cooperative strategic efforts among the national and local governments, companies, universities and other parties, under Government’s initiative, to address global water issues, while educating people in Japan about the importance of water, because such efforts will not only contribute to the recovery and sustainable growth of Japan but also contribute to achieving the security of human beings and consequently improving the leadership and presence of Japan.

The research also revealed the importance of domestic water issues: Japan has

relatively high precipitation steep topography but, due to various factors, restrictions are imposed on the use of water. In order to address domestic water issues, it is important to develop legislation, including the review of systems related to water administration. It is also important to promote water-related scientific technology and develop human resources in water issues. The research has made us convinced that knowledge and experience acquired from these efforts to address domestic issues would also be very useful in addressing global issues. Based on this recognition, the committee gathered and organized opinions from its members, which are included in the “Issues and Recommendations” section of this paper.

In 2013, which is the International Year of Water Cooperation, the United Nations Special Thematic Session on Water and Disasters and the 2nd Asia-Pacific Water Summit were held, providing momentum toward solving global water issues. In line with the global trend, the Research Committee’s recommendations aim at further promoting Japan’s international cooperation toward solving water issues. It is our sincere hope that those concerned fully understand the intent and contents of these recommendations and incorporate them in future measures.

## Reference 1 Timeline of Three-Year Deliberations

[1st year]

Diet Session	Date	Outline
176th	November 12 (Friday), 2010 (No. 1)	1. Election of chairman 2. Election of Directors
	December 3 (Friday), 2010 (No. 2)	1. Request for continuation of research 2. Dispatch of committee members
177th	February 8 (Tuesday), 2011 (Inspection tours)	1. Fact-finding survey on water issues [Sites visited] National Institute for Environmental Studies National Institute of Advanced Industrial Science and Technology (AIST) (Tsukuba Center Chuo Campus)
	February 16 (Wednesday), 2011 (No. 1)	1. Request for attendance of voluntary testifiers 2. Research on International Affairs, Global Environment and Food Issues: Current status of water issues [Statement of views by voluntary testifiers, Q&As] Taikan OKI, Professor, Institute of Industrial Science, the University of Tokyo Tsugihiko WATANABE, Professor, Research Institute for Humanity and Nature Kiyoko IKEGAMI, Director, United Nations Population Fund, Tokyo Office
	February 23 (Wednesday), 2011 (No. 2)	1. Research on International Affairs, Global Environment and Food Issues: Efforts to address water issues [Statement of views by voluntary testifiers, Q&As] Mikiyasu NAKAYAMA, Professor, Graduate School of Frontier Sciences, the University of Tokyo Kotaro TAKEMURA, Secretary General, Japan Water Forum Kazunari YOSHIMURA, Representative, Global Water Japan; Technical advisor to the United Nations; Guest Professor, Azabu University
	April 27 (Wednesday), 2011 (No. 3)	1. Research on International Affairs, Global Environment and Food Issues: Efforts to address water issues [Statement of views by voluntary testifiers, Q&As] Masami ITO, Chairman of Steering Committee, Global Water Recycling and Reuse System Association Takashi HONGO, Special Advisor and Head, Environment Finance Engineering Department, Japan Bank For International Cooperation (JBIC), Japan Finance Corporation Shinya EJIMA, Director General, Global Environment Department, Japan International Cooperation Agency (JICA)

May 18 (Wednesday), 2011 (No. 4)	<ol style="list-style-type: none"> <li>1. Research on International Affairs, Global Environment and Food Issues: Issues related to water issues [Statement of views by voluntary testifiers, Q&amp;As] Masaharu HOSHI, Professor, Research Institute for Radiation Biology and Medicine, Hiroshima University Gen SUZUKI, Medical Director, International University of Health and Welfare Clinic; Professor, International University of Health and Welfare Graduate School</li> <li>2. Request for attendance of voluntary government testifiers</li> <li>3. Research on International Affairs, Global Environment and Food Issues: Issues related to water issues [Government explanations, Q&amp;As] Ministry of Economy, Trade and Industry; Ministry of Land, Infrastructure, Transport and Tourism; Ministry of Foreign Affairs; Ministry of Health, Labor and Welfare</li> <li>4. Research on International Affairs, Global Environment and Food Issues: Desirable Forms of Efforts [Exchange of views among committee members]</li> </ol>
June 8 (Wednesday), 2011 (No. 5)	<ol style="list-style-type: none"> <li>1. Research Report</li> <li>2. Interim Report</li> </ol>
August 31 (Wednesday), 2011 (No. 6)	<ol style="list-style-type: none"> <li>1. Request for continuation of research</li> <li>2. Dispatch of committee members</li> </ol>

[2nd year]

Diet Session	Date	Outline
178th	September 30 (Friday), 2011 (No. 1)	<ol style="list-style-type: none"> <li>1. Resignation of Director and election to fill vacancy</li> <li>2. Request for continuation of research</li> <li>3. Dispatch of committee members</li> </ol>
178th After Diet session	October 5 (Wednesday) and 6 (Thursday), 2011 (Dispatch of committee members)	<ol style="list-style-type: none"> <li>1. Fact-finding survey on efforts to deal with water issues [Sites visited] Kobe City Center for Membrane and Film Technology, KOBE University Osaka City Kaizuka Factory, NAGAOKA International Corporation NITTO DENKO CORPORATION</li> </ol>

179th	November 30 (Wednesday), 2011 (No. 1)	<ol style="list-style-type: none"> <li>1. Election of Director to fill vacancy</li> <li>2. Request for attendance of voluntary government testifiers</li> <li>3. Request for attendance of voluntary testifiers</li> <li>4. Report by dispatched committee member</li> <li>5. Research on International Affairs, Global Environment and Food Issues: Water issues in Asia (Damage caused by the flood in Thailand and responses to the disaster) [Government explanations, Statement of views by voluntary testifier, Q&amp;As] Ministry of Land, Infrastructure, Transport and Tourism; Ministry of Economy, Trade and Industry Izumi ARAI, Vice-President, Japan International Cooperation Agency (JICA)</li> </ol>
	December 9 (Friday), 2011 (No. 2)	<ol style="list-style-type: none"> <li>1. Election of Director to fill vacancy</li> <li>2. Request for continuation of research</li> <li>3. Dispatch of committee members</li> </ol>
180th	February 15 (Wednesday), 2012 (No. 1)	<ol style="list-style-type: none"> <li>1. Election of Director to fill vacancy</li> <li>2. Request for attendance of voluntary testifiers</li> <li>3. Research on International Affairs, Global Environment and Food Issues: Water issues in Asia (present status and issues pertaining to water issues in Indochina peninsula and other parts of Southeast Asia) [Statement of views by voluntary testifiers, Q&amp;As] Tadashi YAMADA, Professor, Faculty of Science and Engineering, Chuo University Kimio TAKEYA, Visiting Senior Advisor, Japan International Cooperation Agency (JICA) Hajime MORI, President and CEO, Kisui Water Treatment Japan, Inc.</li> </ol>
	February 22 (Wednesday), 2012 (No. 2)	<ol style="list-style-type: none"> <li>1. Research on International Affairs, Global Environment and Food Issues: Water Issues in Asia (water issues in Central and Southern Asia and efforts by Japan) [Statement of views by voluntary testifiers, Q&amp;As] Manabu SHIMIZU, Professor, Faculty of Economics, Teikyo University Jumpei KUBOTA, Associate Professor, Research Department, Research Institute for Humanity and Nature Masataka NAKAHARA, Director General, South Asia Department, Japan International Cooperation Agency (JICA) Masaru OZAKI, Executive Director, Japan Water Works Association</li> </ol>
	February 27 (Monday), 2012 (Inspection tours)	<ol style="list-style-type: none"> <li>1. Fact-finding survey on water issues [Sites visited] Tsukuba Central Research Institute, Public Works Research Institute International centre for Water Hazard and Risk Management (ICHARM), Public Works Research Institute</li> </ol>

February 29 (Wednesday), 2012 (No. 3)	1. Research on International Affairs, Global Environment and Food Issues: Water Issues in Asia (water issues in China and efforts by Japan) [Statement of views by voluntary testifiers, Q&As] Hidefumi IMURA, Professor, Global Cooperation Institute for Sustainable Cities, Yokohama City University Toshiyuki HATTORI, President, Env Biz Tech, Inc. Meguri AOYAMA, China scholar, Researcher, Keio Institute of East Asian Studies
April 18 (Wednesday), 2012 (No. 4)	1. Research on International Affairs, Global Environment and Food Issues: Water Issues in Asia (issues pertaining to efforts to address Asia's water issues) [Statement of views by voluntary testifiers, Q&As] Satoshi TAKIZAWA, Professor, Department of Urban Engineering, the University of Tokyo Graduate School of Engineering Akio SHIBATA, President, Natural Resource Research Institute Inc. Kenichi NAKAGAMI, Professor, Ritsumeikan University College of Policy Science
May 31 (Thursday), 2012 (No. 5)	1. Research on International Affairs, Global Environment and Food Issues: Water Issues in Asia (desirable forms of efforts to address Asia's water issues) [Exchange of views among committee members]
June 13 (Wednesday), 2012 (No. 6)	1. Research Report 2. Interim Report
September 7 (Friday), 2012 (No. 7)	1. Election of Directors and election to fill vacancy 2. Request for continuation of research 3. Dispatch of committee members

[3rd year]

Diet Session	Date	Outline
182th	December 28 (Friday), 2012 (No. 1)	1. Resignation of Director and election to fill vacancy 2. Request for continuation of research 3. Dispatch of committee members
183th	February 6 (Wednesday), 2013 (No. 1)	1. Resignation of Director and election to fill vacancy 2. Request for attendance of voluntary testifiers 3. Request for attendance of voluntary government testifiers 4. Research on International Affairs, Global Environment and Food Issues: Current status of efforts to address water issues in Japan and issues [Government explanations, Q&As] Ministry of Land, Infrastructure, Transport and Tourism; Ministry of Health, Labor and Welfare; Ministry of Internal Affairs and Communications; Forestry Agency; Ministry of Foreign Affairs; Ministry of Justice

February 27 (Wednesday), 2013 (No. 2)	1. Research on International Affairs, Global Environment and Food Issues: Issues related to water issues in Africa and the Middle East [Statement of views by voluntary testifiers, Q&As] Masami FUWA, Director General, Global Environment Department, Japan International Cooperation Agency (JICA) Kanetoshi ODA, Chairman and Chief Executive Officer, Nippon Poly-Glu Co., Ltd. and Chairman, Poly-Glu Social Business Co., Ltd. Katsuhiko TAKEDA: Board Member, National Director, CARE International Japan
March 7 (Thursday), 2013 (No. 3)	1. Research on International Affairs, Global Environment and Food Issues: Issues related to global water issues and desirable forms of dealing with them [Statement of views by voluntary testifiers, Q&As] Shinichiro OHGAKI, President, National Institute for Environmental Studies Masaru KURIHARA, Fellow, Toray Industries, Inc. and Head Researcher, Cabinet Office "FIRST Program (Funding Program for World-Leading Innovative R&D on Science and Technology): Mega-ton Water System" Nobuhiro SUZUKI, Professor, Graduate School of Agricultural and Life Sciences, the University of Tokyo Makoto MURASE, CEO, Institute for Sky Water Harvesting
March 13 (Wednesday), 2013 (No. 4)	1. Election of Director to fill vacancy 2. Request for attendance of voluntary government testifiers 3. Research on International Affairs, Global Environment and Food Issues: Water global issues, Japan's international role and desirable forms of dealing with water global issues [Government explanations, Q&As] Ministry of Land, Infrastructure, Transport and Tourism; Ministry of Foreign Affairs; Ministry of Health, Labor and Welfare; Ministry of Agriculture, Forestry and Fisheries; Ministry of Economy, Trade and Industry
April 3 (Wednesday), 2013 (No. 5)	1. Research on International Affairs, Global Environment and Food Issues: Global Water Issues and Japanese Foreign Policy Strategy [Exchange of views among by committee members]
May 29 (Wednesday), 2013 (No. 6)	1. Research Report 2. Reporting on research

## Reference 2 Summary of First and Second Year Interim Reports (Omitted)

## Reference 3 Basic Materials on Water Issues (Omitted)

### <Appendix>

#### List of Committee Members

As of May 29, 2013

Chairman Masashi FUJIWARA (DP-SR)  
Director Takashi ESAKI (DP-SR)  
Director Yataro TSUDA (DP-SR)  
Director Kazuhiko AOKI (LDP)  
Director Haruko ARIMURA (LDP)  
Director Hirotaka ISHIKAWA (NK)  
Director Kota MATSUDA (YP)  
Satsuki EDA (DP-SR)  
Motoyuki ODACHI (DP-SR)  
Ken KAGAYA (DP-SR)  
Toshiyuki KATO (DP-SR)  
Shinkun HAKU (DP-SR)  
Kenzo FUJISUE (DP-SR)  
Misako YASUI (DP-SR)  
Yutaka KUMAGAI (LDP)  
Masahisa SATO (LDP)  
Aiko SHIMAJIRI (LDP)  
Tetsuro NOMURA (LDP)  
Seiko HASHIMOTO (LDP)  
Toshiei MIZUOCHI (LDP)  
Kenta WAKABAYASHI (LDP)  
Shuichi KATO (NK)

Ryo SHUHAMA (PLP)

Tomoko KAMI (JCP)

Yasue FUNAYAMA (GWP)

Notes:

DP-SR: The Democratic Party and The Shin-Ryokufukai

LDP: Liberal Democratic Party

NK: New Komeito

YP: Your Party

PLP: People's Life Party

JCP: Japanese Communist Party

GWP: Green Wind

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