

## **The Great East Japan Earthquake: Lessons for Japan's Energy Policy, Infrastructure Development, and Media Coverage**

### **Welcome Remarks**

**Dr. Yoshiaki Abe**, USJI Operating Adviser / University Professor, Waseda University

Dr. Abe opened the session by welcoming the audience to today's event and gave a brief introduction to the organizer, the U.S.-Japan Institute. He then introduced Dr. Mikiyasu Nakayama who is the moderator and a speaker for the discussion, and handed the floor to him.

### **Moderator & Speaker**

**Dr. Mikiyasu Nakayama**, Professor, Division of Environmental Studies, Graduate School of Frontier Sciences, The University of Tokyo

Dr. Nakayama started by explaining the purpose of today's seminar on the disaster of March 11, 2011, which was a trial for the Japanese system that has long been taken for granted. The seminar will analyze the mechanisms behind vulnerabilities and identify any countermeasures that were ready and available, as well as those that were not. He concluded that this still on-going catastrophe will serve as a once-in-a-generation opportunity for the global community to yielding critical lessons for the future. Dr. Nakayama then introduced the speakers and commentator, and explained the format of the discussion.

### **Speakers**

**Dr. Mikio Ishiwatari**, Senior Advisor in Disaster Management and Water Resources Management, the Japan International Cooperation Agency (JICA)

Dr. Ishiwatari spoke on how Japanese technology and systems worked in the Great East Japan Earthquake. He began by showing the range of the earthquake's effect on Japan by comparing it to the US's east coast, noting that the devastated area spanned longer than the distance from Washington D.C. to New York, approximately 300 miles. He explained that the Tsunami height reached up to 10 meters (32 ft) in the Fukushima area, with the record height being approximately 40 (131 ft) meters.

Dr. Ishiwatari proceeded to review the chronology of the events and how the Japanese disaster management system worked. He explained that this area has suffered from tsunamis repeatedly, which led the residents to move to higher lands. However, the population of this particular region has seen significant increases since then, and this has caused development and subsequent population in the lower lands.

In 2010, the Japanese government predicted an earthquake that would hit the Miyagi area with 99% certainty and the Fukushima area with 7% certainty at a magnitude of 8.0Mw, lower than the actual 9.0Mw magnitude. Since the predictions for the magnitude of the earthquake was smaller than in reality, the height of the tsunami was also predicted to be lower.

Learning from the lessons of the 1995 Kobe earthquake, the government has conducted reinforcement of infrastructures which lessened damage to infrastructures. The UrEDAS (Urgent Earthquake Detection and Alarm System) also detected the earthquake and stopped all bullet trains, reducing damage to cities. Against the earthquake, Japan's disaster management system had worked well.

There were also tsunami dykes up to 15 meters (49 ft) in height built across the coast, but the dykes could not perfectly protect against the much higher tsunami most areas. The Fukushima area had dykes up to 5 meters tall, but the tsunami there measured 10 meters in height. However, Dr. Ishiwatari noted that the dykes did protect some areas and lessened the strength of the tsunami, providing time for evacuation.

Dr. Ishiwatari then discussed Japan's evacuation systems and how they worked. There were 600 earthquake and 80 tsunami observation stations, capable of issuing warnings within 3 minutes, detecting the earthquake and first predicted the tsunami to be about 3 meters tall. The predictions were revised to 6 meters after 30 minutes, and 10 meters after 45 minutes.

Evacuation exercises frequently take place in Japan and disaster management education emphasizes that one must immediately evacuate to higher ground. In reality, one third of the people in affected areas did not immediately evacuate. Dr. Ishiwatari explains that this is because they were searching for their families, they did not think the tsunami would be that high, and they were safe when the last tsunami hit.

Community response by Japan's volunteer firefighting organization to the disaster was quick. They immediately closed sea gates, helped evacuation and monitored tsunami progress at the risk of their lives. There are 250 members recorded dead or still missing.

Dr. Ishiwatari concludes that, Japan's countermeasures and disaster management system work but is still not perfect. The government is currently investing more in the improvement of these technologies, but the most important factor is people. He stresses that people must utilize warning information provided to them, and understand that technology has limitations.

**Ms. Jennifer Sklarew**, U.S.-Japan energy policy specialist

Ms. Sklarew presented on the implications of the earthquake and tsunami for Japan's governance and energy policy making systems, focusing on three frameworks of the energy policy process which are 'priorities', 'relationships' and 'risk perception'. Firstly, Ms. Sklarew reviewed the three E's, the pillars of energy policy in Japan that form the first

framework: Energy Security, Environmental Protection, and Economic Growth. Nuclear power became equivalent with energy security after the 1970s oil shocks, and has always been the main energy source aligned with environmental protection for Japan. Economic growth in the context of the 3 E's is essentially utilization of market mechanisms, or electricity deregulation.

The second framework, relationships, links the government, the public, the private sector, and the media. Within the government there are overlapping jurisdictions that contribute to tensions across the bureaucracy and between it and the Diet. Between the government and the private sector there is a revolving door that connects actors and policies. In the government's paternal relationship with the Japanese public, citizens are willing to sacrifice some freedom of decision so that the government will take responsibility for risks associated with certain choices. The media in Japan engages in planned leaks of policies and public opinion polls, so as to inform the public and maintain the relationships between these different groups.

The final framework that Ms. Sklarew looked at is risk perception. Since the Japanese government is very sensitive to public perception, they release information in a careful, contained way to minimize public concern. This particularly becomes a problem in crises such as the March earthquake, where the government often could not properly control the flow of information. The Japanese public view towards risk perception is essentially zero tolerance, believing that they should not have to deal with risk. The media usually will not question the risks of technologies or policies until a crisis occurs. In the case of the March earthquake, foreign governments and international organizations also played a part in risk perception. A conflict in guidance from the US and Japanese governments on radiation levels and evacuation zones created distrust regarding the Japanese government's communications and decisions. In their observations about the disaster, the IAEA and IEA also had to balance their international roles with domestic Japanese considerations, as both were international organizations headed by a Japanese official.

Ms. Sklarew explained that the Japanese energy policy process in 2003 consisted basically of the three pillars. In 2010, it was revised to also prioritize energy based economic growth and energy industry reform. In terms of relationships specific to the energy policy process, there were overlapping jurisdictions between the METI, MEXT and the PM's office in regulating nuclear energy, but they were still not independent. Government and public risk perceptions have prioritized energy security above all.

Regarding impacts of the disaster, Ms. Sklarew noted that it revealed a need to rebalance the energy policy process and incorporate public safety. The Japanese governance structure contributed to a blame shifting situation that led to significant disintegration of relationships. This collapse has further impacted energy security, inhibiting use of nuclear reactors and revision of Japan's energy policy. A unified regulatory body can help reduce finger pointing and promote transparency and trust. She encouraged the Japanese government's movement toward reflection, transparency and differentiation of old and new technologies to reconnect with the public and regain the trust needed to advance Japan's future energy policy.

**Dr. Mikiko Sugiura**, Visiting Scholar of the Department of Civil Engineering and Engineering Mechanics, Columbia University

Dr. Sugiura's presentation was on the empirical study of the difference in media coverage of the Great East Japan Earthquake. She first sent condolences to all those affected by the disaster. Dr. Sugiura presented two points of view to observe the difference between Japanese and foreign coverage: the difference in appearance and the difference in emphatic points. First, with regard to the difference in appearance, Dr. Sugiura then described the gaps between the facts as presented by Japanese and foreign media during the disaster, and how this gap resulted in public confusion. US news in particular, used satellite images and videos that focused heavily on the negative aspects of the disaster such as destroyed infrastructure to send direct visual messages. On the other hand, Japanese media utilized still pictures and videos as well as numbers for their coverage of the disaster, and there was not much difference across television channels..

Then, regarding the difference in emphatic points, Dr. Sugiura observed that the coverage could be categorized into three: 1) reported much in US but not by Japanese paper media 2) reported much in Japan but not in US 3) dropping information intentionally or unintentionally.

The cause of these differences, explained Dr. Sugiura, lies with whether or not the coverage was by the involved country. The involved country has a need to control information in order to prevent panic, via using numbers and statistics from specialists over visual coverage. Furthermore, news sources were also limited on disaster sites due to the situation, much of the information made available was provided through the local people. The US military was another news source in the case of recovering Sendai Airport, which was not mentioned enough in Japanese paper media while the local Japanese and the internet-connected people shared much gratitude and thought that it deserved more. The cause of information imbalance could be political in the same way of U.S. base.

The political situation in ordinary time Japan was reflected even in the crisis. Information imbalance was created when sources were limited, and this led to a gap in information between Japanese people. Dr. Sugiura concluded with lessons to be learnt: there needs to be a balance in information diversity, the information dispatchers need to exercise transparency while receivers should be educated in media literacy.

**Dr. Mikiyasu Nakayama** concluded the speaking session with his own presentation on developing an interconnected energy network in the region. Dr. Nakayama first discussed the current energy situation in Japan. Nuclear power plants have been in limbo, with no clear idea from the government on how to proceed and a domestic impasse to a transboundary solution. In Japan, thermal power generation is costly and produces much CO<sub>2</sub>, geothermal and hydro power stations have few feasible new sites, while nuclear power has insecure

prospects. While in Asia, hydro power generation has much potential, there are promising sites for solar and wind power stations, and thermal power stations may consume locally produced coal and oil.

Dr. Nakayama proposed that there should be serious consideration for the development of a ‘super grid’ interconnecting Asia. He explained that an interconnected global grid was first envisioned by Buckminster Fuller in the 1970s. Regional projects have been proposed before and he provided examples in the Gobitec Initiative and the DESERTEC Concept. Such a project is feasible in Asia due to the previously mentioned opportunities in renewable energy sources. The only obstacle to this would be that wind power potential is limited to the winter when wind blows, despite summer being the season when power is needed more in such city as Tokyo. Dr. Nakayama suggested that this can be overcome if the super grid were to connect both the southern and northern hemisphere.

He then quoted Al Gore, stating that such technologies are developed and readily available, but there is no political will to carry them out. The super grid concept is definitely affordable from Japan to Australia, and Dr. Nakayama estimated that it would have a cost close to transporting Liquefied Natural Gas from abroad to Japan for a few to several years. He observed that there have been concerns regarding the security of such a project, but reassured that security would not be an issue. In fact, as we have seen in the Mekong basin between China and the downstream countries, an interconnected super grid might even contribute to increasing security between the involved nations. Networking of resources motivates buyers and sellers to increase security between them.

### Commentator

**Dr. Norio Yamamoto**, Executive Vice President, Global Infrastructure Fund(GIF)  
 Research Foundation Japan

Dr. Yamamoto began his comments by expressing his sincere thanks to the global community especially the U.S. and “Tomodachi Operation” in their support of Japan through this disaster.

He then noted that, as Dr. Ishiwatari said, evacuation exercises are very important. If people are not ready for emergencies, technology is rendered useless.

From the experiences of a friend, Lt. Governor in the local government of Aomori Prefecture facing the Pacific Ocean as well as the other damaged prefectures, Dr. Yamamoto recalled when a tsunami prediction did not come true. People were upset because the warning had affected their daily lives and businesses. When the Aomori Pref. Gov. conducted a survey afterwards, they found that only 5% of the population had followed evacuation orders. This encouraged the Aomori Pref. Gov. to start drills and exercises, which greatly contributed to minimizing the casualties of Aomori during the March disaster.

Dr. Yamamoto acknowledged that Ms. Sklarew's analysis of the Japanese nuclear bureaucracy was very complete, and commented that, as Dr. Sugiura has demonstrated, media coverage is a very important subject. He added that Japanese media had only very briefly mentioned Operation Tomodachi at the reopening of the Sendai Airport on the 13<sup>th</sup> of April, and suspected that there might be some tacit understanding in the media. He admitted that is a weak point of Japanese journalism as well as Japanese society in general.

On Dr. Nakayama's presentation, Dr. Yamamoto noted that the Global Infrastructure Fund Research Foundation Japan is also promoting multinational wide range resource networks such as natural gas pipeline network and electric grid. He believed global electric grid to be very important as a solution to equalize unevenly excessive production and consumption of electricity. He cites the example of Europeans enjoying natural gas resources from Russia through efficient gas pipeline system that they are still trying to increase, and electricity supply from among the close neighboring countries. Japan is, of course, an isolated island country making it not so easy-for such networking. However, Dr. Yamamoto observes that the successful Sakhalin natural gas production site is located very close to Hokkaido, and cost to transport natural gas is not high. if trans-border gas pipeline is available over the Soya strait between Sakhalin and Hokkaido. For more than 10 years in the past, Dr. Yamamoto's group has been promoting the construction of trunk gas pipeline system from Hokkaido to Kyushu. If Japan had such a system, there will be alternatives to solve the energy difficulties during emergencies. Right now in Japan, there are two different electric grid systems in the East and the West respectively. After the earthquake, when the West (Kansai) is experiencing shortage of electricity, the East (TEPCO) seems ready to supply electricity to the West region, due to the two different frequencies 50 hertz in the East and 60 hertz in the West respectively. Japan must consider the disadvantages of its society more seriously and improve.

Nuclear energy is one of the essential sources of energy in Japan, as new and renewable source energy are still very small compared to demand. Nuclear power is very unpopular at the moment, but Dr. Yamamoto thought that if Japan is to be responsible for the next generation, it must continue to rely on nuclear energy.

Not only that, Japan now has a large stake in the future of global nuclear energy since Toshiba recently acquired Westinghouse, a major global nuclear supplier along with other corporations such as General Electric or Areva ( Electricite de France). The other two Japanese heavy industries, Mitsubishi Heavy and Hitachi are in cooperation with Areva and GE respectively.

He concludes that while Japanese nuclear technologies are very advanced, plants such as some of nuclear reactors at the Fukushima plants had been regarded old enough for good retirement and can cause unfortunate incidents. Dr. Yamamoto advised that investing in more sophisticated cost-effective technologies and improving decision making system might be essential that Japan can utilize to prevent such disasters in the future.