

Japan's Disaster Response Management: Lessons for the World

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Introduction

The massive earthquake (known as the Tohoku earthquake) and the subsequent tsunami that struck Japan on March 11, 2011, and the following release of radiation from the Fukushima Dai-ichi nuclear power station, constitute one of the greatest disasters to strike Japan in recent times. This triple disaster falls within the risk profile of Japan's disaster management programme. There were no contributing factors that could not or should not have been predicted and accounted for. As it transpired however, Japan's disaster response management failed because of systemic weaknesses, that had been identified in previous similar events, including the 1995 Kobe–Hanshin earthquake. The inexperience of the governing Democratic Party of Japan (DPJ) and domestic political compulsions led them to withhold information from the public and this made them the target of accusations over the mishandling of a crisis of such gigantic proportions.

The events of March 11 reminded the world of how quickly new situations challenge the fundamental rules and principles developed by crisis response managers. The systemic failures of the Japanese government represented almost the same weaknesses that were identified in the US following Hurricane Katrina and 9/11. Despite human frailty and nature's unpredictable behaviour, the Big Event was an inevitable consequence of Japan's geographical positioning across major tectonic faults. It is because of this vulnerability that earthquakes and tsunamis are factored into disaster planning in Japan at every level from the central government to local village disaster committees. The truism, however, is that once the disaster hits, the enormity of the event leads to failures at every level of the crisis response management system.

Though the scale of the crisis is often described as unprecedented, the problems of response management were the same as those identified disaster response programmes across the world.¹ The tragedy took place in an advanced, technologically-enabled nation and should have been predicted because Japan has a 100-year-old tradition of national disaster response planning?² Moreover,

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its prediction of such a devastating scenario should have led to proper planning to face challenges like a high-magnitude earthquake and tsunami when they occur. The Japanese people, therefore, are seeking answers to legitimate questions as to why the government's response capability proved to be ineffective, and what are the fundamental flaws that render it ineffective when faced with the realities of actual disaster management.

It is often reported that the earthquake had been predicted well in advance and, to the outside world, it would appear to have been within normal planning parameters to deal with the tsunami that followed the quake. This, however, was not the case.

Disaster in Context

As per all available reports and US Geological Survey data, a massive earthquake hit Japan at 2.46 pm on March 11, 2011, 80 miles off the coast of Honshu (Japan's most populous island), approximately 240 miles from Tokyo.³ The initial shock was measured at a magnitude of 9.00 on the Richter scale⁴, the fourth highest in the world since 1900. The Tohoku earthquake is considered to be the most powerful to have hit Japan since records began to be maintained 130 years ago. The quake was followed by powerful aftershocks, the first of which occurred 30 minutes later with a magnitude of 7.4, and many shocks thereafter for several weeks. This was followed by a massive tsunami that swept across the north-east coast of Japan, reaching several miles inland and flooding hundreds of square miles of land.⁵

The earthquake and then the tsunami waves caused unprecedented levels of devastation and destruction. Huge tidal waves swept away cars, buses, ships, boats, and even houses. Over 4 million buildings were damaged, electricity supplies were cut off, and drinking water pipes destroyed. The disaster also resulted in destruction and damage to roads, bridges, ports, railroads, buildings, and other infrastructure. An estimated 28,000 people were dead or missing. The earthquake and tsunami affected more than two dozen prefectures with an estimated population of over 15 million of which eight prefectures⁶ suffered the most. The estimated cost of destruction was over \$300 billion or about 4 per cent of Japan's gross domestic product (GDP). In addition to the destruction and cost to life, facilities at Fukushima Dai-ichi nuclear power station were severely damaged in the disaster. As a result, the electrical power system that supported plant operations broke down. Flooding disabled generators that had powered the cooling systems in the reactors, and the pools in which fuel rods were stored. The loss of coolant resulted in overheating which caused the breach of the containment vessels and, subsequently, released radiation into the air,

ground, and water requiring the mass evacuation of the local population. Some were ordered to take shelter in places arranged by the authorities because of lack of transportation and the risk of exposure to radiation.⁷ Dealing with a task of such tremendous proportions required disaster management of the highest level and the authorities were as helpless as the citizens themselves.

Disaster management includes managing resources and providing basic amenities to citizens in case of rain-floods, natural calamities, accidental tragedies, etc. But given the magnitude of the disaster that it Japan on its own was incapable of handling the crisis and global efforts were required to restore normalcy.

Disasters can be of many kinds and the responses have to be disaster-appropriate. Normal or routine disasters may be triggered by floods or snow storms and the responses are normally local; in such cases, local resources may be adequate and international support can be requested, if needed. However, catastrophic disasters such as that Japan suffered in March 2011 represent a different kind of disaster and local resources were not adequate as they were crippled by loss of infrastructure. The authorities found it difficult to determine the priority needs of the people. Some of those in authority were themselves the victims of the disaster. Immediate mobilisation of resources was hampered by loss of infrastructure and time required to organise them. Medical aid, water, food, and the need to check the spread of disease were the main priorities. Given the enormity of the disaster these immediate measures proved to be inadequate. Fukushima is a clear example of how Japan should have maintained its disaster response preparedness to the optimum.

An initial assessment of the Japanese response in four critical areas provides important lessons for the world, for dealing with catastrophes when they occur. In a special report prepared on the Great Eastern Japan Earthquake, the Heritage Foundation focused on four key areas that are particularly critical for responding to large-scale crises: (a) preparedness and response, (b) communication skills, (c) international assistance, and (d) critical infrastructure.⁸

As regards *preparedness and response*, the report observes:

Preparing to respond to, and mitigate the impact of, disasters as well as delivering assistance during and after the incident comprise the 'preparedness and response' aspect of dealing with disasters. Activities included under this umbrella are the activities of government at all levels, as well as of the private sector, communities, individuals, volunteers, and non-governmental organizations.⁹

Japan's response to the crisis was massive. The government established an emergency response team headed by the Prime Minister. In the midst of a national calamity, Japan handled the disaster with calm and poise. The stoicism and efficiency with which the Japanese used their human capital and organisational skills for dealing with the situation was remarkable. The way Tokyo sprang back to life and business within hours while coping with the situation says a lot about Japan's national character.¹⁰

The Japanese government and the Self-Defense Forces (SDF) swung into action quickly. The SDF's efforts were quickly strengthened and supplemented by deployment of forces by its allies. The capacity of Japan's executive to respond decisively was no longer an issue to be debated. The DD *Harusume* in Yokosuka Bay was quickly dispatched on a rescue mission, as were other Maritime Self-Defense Force (MSDF) teams and ships. The government also dispatched nearly 28,000 members of the National Police Force and the Fire and Disaster Management Agency for the rescue mission. The Japanese Red Cross, which serves as an auxiliary to the government for disaster relief, also chipped in. The government also allocated almost \$50 billion for critical tasks, such as debris removal, temporary housing, and restoration of infrastructure.¹¹

In view of the gigantic rescue operation, it was not expected that the operations would be flawless. But the scale of the task at hand was such that any perfection in preparedness and response was not possible. In particular, children, aged people, the poor, and pets suffered disproportionately as it was difficult to reach them because road networks were heavily damaged. The problem got compounded when pets could not be kept in evacuation centers and when the elderly showed reluctance to abandon their homes. The Japanese-style of leadership, which is based on consensus and adherence to established procedures, led to delays in disaster response. The enormity of the task demanded on-the-spot decisions and evacuation orders, which were lacking. It was frustrating to note that the lessons learnt from the 1995 Hyogo-ken Nambu earthquake near the city of Kobe—when well-intentioned volunteers crowded the affected areas to help those in need—were not allowed this time as they hindered the first responders trying to deliver aid.¹² In fact, officials warned volunteers not to respond unless requested.

As a developed country sitting on seismic fault lines, Japan's capacity to prepare for, mitigate, and respond to disasters is superior. Indeed, high-income nations respond better to catastrophic disasters than low-income or middle-income countries. Countries with disposable incomes respond more effectively and recover more quickly by rebuilding their damaged infrastructure.¹³

In Japan's case, it employed a "consolidated disaster management system for disaster response" and this posed "coordination and logistical challenges".¹⁴ In effect, bureaucratic hurdles hindered the disaster response to some extent. The heavy centralisation of authority came in the way of dealing with large-scale and widespread disasters. This is because in a heavily centralised system, it becomes difficult to obtain and process all the information needed to make and execute deliberate decisions. "The system becomes a 'bottleneck' that delays the responsive and adaptive delivery of aid."¹⁵ If the scale of the disaster is big, a decentralised system enables the local leaders and community to act on their own.

In a report released by the Government of Japan in 2009, it was noted that "all of Japan's national territory is covered by early warning systems for storms, torrential rains, heavy snow, sediment disasters, tsunami, tidal waves, high surf, inundation and floods."¹⁶ The Ministry of Land, Infrastructure and Transport, the Japan Meteorological Agency, and local government bodies are the main bodies involved in disaster management. The Japanese people are well informed regarding the level of tsunami and earthquake preparedness. The Cabinet Office conducted regular Disaster Preparedness Surveys during 1991, 1995, 1997, 1999 and 2002.¹⁷ However, there are always some loose ends.

There are different perspectives on how to deal with the tsunami. Fumihiko Imamura, a professor at Tohoku University's Disaster Control Research Center holds the view that infrastructure spending by Japan could have lessened the impact of the tsunami but the government became too reliant on low-cost measures such as handing out warning maps.¹⁸ Imamura recommends that Japan should adopt Western-style urban planning and keep houses and hospitals further inland from the coast as it rebuilds after the crippling disaster.

Imamura, a scientist who has been studying tsunamis for nearly 30 years, uses computer models based on historical data to predict the speed and size of the deadly waves caused by earthquakes. The tsunami that savaged Japan's north-east coast was one of the largest in recorded history and far bigger than anything anticipated by scientists because they did not expect such a massive earthquake. According to Imamura, the government should plant more pine trees and mangroves along the coast to slow down a tsunami, and build more evacuation centres that can withstand the waves.

However, while engineering measures such as seawalls and flood dykes can reduce regular risks such as annual cyclones and floods, they are not always able to protect the people from the extreme.¹⁹ Engineering and technology are not the only "best" solutions.²⁰ Indeed, there is no first best solution for tsunami risk reduction in Japan and elsewhere.²¹

As regards *communicating the risk*, Japan relied heavily on formal early warning systems, evacuation plans, and alerts to limit loss of life. Indeed, Japan does have in place an extensive warning system for disasters like earthquakes and tsunamis. The mediums range from traditional warning sirens to social media tools, such as Twitter. Regrettably, these warning systems and alerts were not perfect in Japan. It transpired that the government faced difficulties in communicating in the aftermath of the crisis. Japan's heavy bureaucratized system hindered the faster communication of information to the people. The government response was also seen to be inadequate when the situation at the Fukushima nuclear plant created fear and uncertainty among Japanese citizens. This led to speculation and misinformation in news reports around the world. The situation at Fukushima was unanticipated and the government's response as per established systems and scripted warnings proved to be less than effective. This led to delays in the evacuation plans and haphazard handling of the matter.

For the extremely resilient Japanese people, a mix of perseverance and a resignation to fate has allowed them to look beyond, often dangerous, uncertainties. But as the tragedy continued to unfold, the lack of clear information undermined social cohesion. The government failed to convey accurate and timely information to the people. There are four reasons for this.²²

First, the decision makers, whether in the government or in the Tokyo Electric Power Company (TEPCO), the utility in charge of the ill-fated Fukushima nuclear power plant, did not have complete information on what was happening at the nuclear plant site. "Not only [were] they busy working, but peering into the earth's crust to see when the next quake will be and looking behind a veil of radiation to examine what is happening in the nuclear reactor [was] just not possible."²³ Second, the government was balancing what it believed to be the competing priorities of informing the public about an evolving situation and reducing fear. Officials were worried that if the full facts were released to the people, it could lead to panic. Though this reasoning could have been right, in the midst of a dynamic emergency a perceived lack of candour in official statements undermined public trust to some extent. Third, sharing information within bureaucratic organisations is often difficult even in good times. In difficult times, it creates further obstacles to communicate details to decision makers. Fourth, The government has a tendency to want to have all the facts before making an announcement or a decision. Releasing information based on hunches or half-completed work can be seen as a failure to do a complete job. But in emergency cases, a timely decision based on some information, is better than a delayed decision with complete information.²⁴

As one assessment of the disaster concluded, "soft measures", such as community awareness and effective risk communication, may have played a more decisive

role in saving lives than extensive protective measures, such as seawalls designed to withstand flooding from tsunamis.²⁵ What was more troubling was the inability of the Japanese government to effectively communicate the risks associated with the low-dose radiation exposure as a result of damage at the Fukushima nuclear plant. Not only was information released by Japanese ministries, TEPCO, and the International Atomic Energy Agency found to be conflicting, it was also far from reality, inaccurate, and incomplete, leaving the general public baffled and bewildered. The Japanese government headed by Kan Naoto devoted more time on advocacy against the efficacy of nuclear power rather than on providing effective risk communication. The Japanese government then elevated the risk level of the Fukushima plant to “seven”, which is that of a major accident and this placed disaster on par with the 1986 Chernobyl reactor disaster, though the release of radiation at Fukushima was far less substantial.

International assistance, either sought or offered, is the third dimension of disaster management and includes aid from foreign countries, international organisations, non-governmental agencies, foreign volunteers and philanthropists. Though it is uncommon for rich nations to need or request foreign aid, Japan's case was different owing to the magnitude of the disaster. Within a month of the earthquake and tsunami, Japan received offers of assistance from at least 134 countries, 33 international organizations, and 670 NGOs.²⁶ Japan Platform (an international emergency humanitarian aid organisation) and the Japan NGO, and the Center for International Cooperation (acting as part of the Japan Civil Network for Disaster Relief in East Asia) were the key organisations coordinating with international NGOs.²⁷ Japan accepted 2,000 blankets from Ukraine and special search and rescue disaster response teams from several countries. The US military provided extensive assistance.²⁸ On April 11, 2011, the Japanese Prime Minister's office issued a letter thanking the global community for their support and friendship, which was published in every major newspaper in the world.²⁹

The Government of Japan welcomed financial donations and asked member states to donate through the Japanese Red Cross (JRC). Japan's overseas missions also accepted relief funds and channelled them through the JRC. More than 91 per cent of the contributions were raised from the private sector. There were record donations to national Red Cross societies, with the JRC receiving \$725 million, while the American Red Cross raised \$120.5 million and the Red Cross in South Korea raised \$19.1 million. According to the Ministry of Foreign Affairs, Japanese diplomatic missions abroad received \$12 million.³⁰

The US Pacific Command (PACOM) activated elements of Joint Task Force 519, which is trained to respond to large-scale crises and contingencies that span the operational spectrum in the Asia-Pacific region, to augment the staff of US Forces Japan (USFJ) to form the Joint Support Force (JSF). The US commenced

Operation Tomodachi—(Japanese for “friendship”)—which was to be led by the Japan Self Defence Forces (SDF). The operation team was a joint task force of the US armed forces that had multitude of capabilities including equipment, air, sea, and ground capability and expertise.³¹

The US Navy was committed to assist JSDF's with 13,076 personnel, 16 ships, and 130 aircraft, as part of Operation Tomodachi. The US Seventh Fleet delivered 260 tonnes of HA/DR supplies to victims of the tsunami and quake, and flew more than 160 aerial reconnaissance and search sorties.³² The USS Ronald Reagan, and its two escort ships, the USS Preble and the USS Chancellorsville conducted relief operation under Operation Tomodachi.

Marines and sailors from III Marine Expeditionary Force (III MEF) also supported relief operations while the air force undertook airlifts, search and rescue (SAR) and intelligence, and surveillance and reconnaissance missions (ISR). The US embassy in Tokyo immediately provided an initial \$100,000 from its USAID programme.³³

The Government of India sent a consignment of 25,000 blankets, 13,000 bottles of mineral water, and 10 tonnes of high-calorie biscuits for the survivors of the disaster. Besides, a 46-member National Disaster Management Authority Response Force was dispatched to assist relief efforts in the affected region. The Japanese government highly appreciated India's gesture of real friendship.³⁴

The lesson that Japan had learnt from the 1995 Kobe earthquake was that it should accept the help of other countries. In 1995, Japanese government showed extreme reluctance to accept aid from abroad. This could have been for two reasons: the unwillingness of Japanese leaders to be seen to be accepting help from what were seen as less-developed countries, and the inability to by-pass normal bureaucratic and administrative procedures.³⁵

The fourth dimension of disaster response is related to the *critical infrastructure* issue. When disaster strikes, a nation's critical infrastructure becomes the first casualty as agriculture, food, water, public health, emergency services, industrial base, information and telecommunication, energy, transportation, banking and finance, and other key areas such as nuclear power plants, dams, and commercial activities are all affected. In Japan's case, parts of the country experienced loss of critical infrastructure on a catastrophic scale. The Miyagi Prefecture faced the brunt of the nature's fury. As much as 45,000 structures were destroyed by the earthquake and tsunami, of which 29,500 were alone in Miyagi. About half of Ishinomaki and Yamamoto were flooded, and 15–18 million tonnes of debris had to be removed in Miyagi alone.³⁶

The loss of the Fukushima nuclear power plant meant a double blow to disaster recovery. The Japanese government and TEPCO came under intense criticism for not ensuring that the facilities at Fukushima were adequately prepared for the disaster. The economic consequences of the Fukushima accident were felt not only in the areas close to the affected plant, but in manufacturing similar plants around the globe. For example, Toyota and Sony could not get the parts needed for production and were forced to shut down business. This disruption in production had a cascading effect on consumers outside Japan as well, thus demonstrating that the resilience and recovery of critical infrastructure significantly affected responses in catastrophic disasters.³⁷

Preparing for the Response

David Rubens Associates, in its preliminary report of May 2011, lists four failures in planning: scale of the impact, topography, nuclear implications, and weather.³⁸ The tragic destruction caused by the scale and power of the tsunami was beyond human imagination.

There is no technology that would provide an effective defence against even a mild tsunami (which is why so much energy and expense is put into developing early warning systems and effective public communication networks, rather than physical defence systems), and it is unlikely that anything that the Japanese authorities could have done would either lessened the impact of the tsunami itself, or would have improved the ability of the vast majority of the population caught within the tsunami strike zone to have been able to evacuate the affected area in time to avoid the massive amounts of death and destruction.³⁹

Topography too becomes a factor in disaster response. Since Japan is an extremely mountainous country, it was difficult for the authorities to deliver immediate first-response and emergency relief services to the people residing in inaccessible areas. The third factor is more important than the first two: with the third largest number of nuclear reactors in the world (after the US and France), Japan should have factored in national crisis management response in the likelihood of any earthquake and its impact on these nuclear facilities. The response to the nuclear crisis was characterised by lack of political leadership, conflicting messages concerning public safety, and the inability of the plant operator to identify appropriate crisis management programmes for the escalating radiation. Despite almost 50 years of planning for dealing with exactly such a situation, "there was in fact no structure in place that would have allowed a speedy, appropriate and, most importantly, coordinated crisis management programme to be triggered."⁴⁰ Japan has an institutionalised pattern of behaviour in as much the nuclear industry (plant operators) has the tendency to falsify data concerning safety breaches within its facilities, and the Japanese political leadership, tends to

downplay the danger to public safety on the grounds of “ensuring public safety and confidence”.⁴¹ Lastly, the weather conditions had significant impact on the national response management programmes as sub-freezing temperatures hampered emergency response teams’ rescue operations.

Yoshiaka Kawata, a professor at the Research Center for Disaster Reduction Systems, Kyoto University, in his 2001 paper, put forward an alarming scenario for Japan. According to him, the 1995 Kobe earthquake was the first gateway to the next Nankai earthquake. The next big earthquake, according to him, will occur in or around 2035, with a magnitude of 8.4 or more, with similar consequences. He predicted that the earthquake will be accompanied by huge tsunamis which will hit densely populated Pacific facing coastal areas with a population of more than 10 million. Thus, Japan had 39 years to plan for disaster. As the event of March 2011 proved, this prediction went wrong and the Big One happened 10 years earlier.⁴²

According to University of Tokyo’s Earthquake Research Institute, as reported in *The Yomiuri Shimbun* dated August 30, 2011, the risk of the southern Kanto region (including Tokyo) being hit by a major temblor within the next four years could be as high as about 70 per cent. The figure is the same as the 70 per cent forecast given for a magnitude 7.0 temblor hitting the region in the ambiguous “next 30 years” that has been issued by the government’s Headquarters for Earthquake Research Promotion on the basis of intervals between large quakes in the past.

According to the Institute, the possibility of a huge plate-boundary earthquake amplified by simultaneous moves in two or more focal areas beneath Tokyo has been increasing since the Great East Japan Earthquake. The average number of quakes measured at magnitude 3 or more in the five years preceding the March 2011 disaster was about eight a month. The Institute discovered that the number of small-scale plate-boundary quakes that are not felt by people has drastically increased following the March 11 earthquake.

This is not to suggest that Japan lacks a developed framework of disaster management that, in theory at least, allows all participants to be able to make an effective contribution based on their own capabilities and specialist knowledge, whether at the national, regional, or local levels. Japan maintains a clearly delineated disaster management (or Disaster Prevention—*Bousai*) organisation with a range of policies.⁴³ The government also conducts several programmes to educate the people about the basic immediate response in the event of an earthquake or tsunami.⁴⁴ After the Kobe earthquake in 1995, the government established the Disaster Response Management cell with the Central Disaster Management Council (*Chuo Bousai Kaigi*) chaired by the Prime

Minister consisting of all cabinet ministers and others with expertise in disaster management.⁴⁵

in its report on the 1995 Hanshin-Kobe earthquake, however, the Japan Policy Research Institute was critical of this council. The report noted that the Central Disaster Management Council does not in itself solve the traditional problems of decision-making in Japan, as it was a ministry-centric or agency-centric view of response management, rather than an integrated response capability.⁴⁶

Japan's Recent Moves

Japan is geared-up to face the challenge of disaster preparedness. The House of Representatives Deliberative Council on the Constitution, set up in 2007, is considering proposals to amend the Japanese Constitution. The Council remained dormant since its inception as the ruling DPJ refused to appoint its Council representatives. Now, the DPJ is acting to improve the party's negative image. The Council is mandated to discuss in-depth what actions the Prime Minister should take to protect peoples' lives and property when major disasters strike Japan.⁴⁷ The current Constitution does not have any provision concerning emergencies, except for a clause on an emergency session of the Upper House when the Lower House of the Diet is dissolved. In many countries, there are laws on the government's role during emergencies and it is argued that Japan's Constitution should also have a provision.

Arguing for inclusion of an emergency clause in the Constitution, *The Yomiuri Shimbun* observed in an editorial:

Responses to emergencies are specified in the Basic law on Natural Disasters as well as in a series of contingency-related laws. To enable the government to cope with emergency situations, however, it is necessary to not only temporarily strengthen the prime minister's authority but also to have provisions designed to prevent basic human rights and deliberately being infringed upon.⁴⁸

The Government of Japan is also planning to establish a large-scale international natural disaster insurance system encompassing the Asia-Pacific region to cover developing countries hit by devastating earthquakes, typhoons, and other disasters. Japan wants to utilise the lessons learnt from the Great East Japan Earthquake and other disasters to assist in disaster prevention in developing nations. By playing a leading role in the insurance scheme, Japan wants to share its disaster-prevention technologies with other countries.⁴⁹

The scheme will be set up by the Japanese government, the World Bank, and the Asian Development Bank (ADB). It will be funded by premiums paid by countries and territories who are part of the insurance scheme and by monetary contributions from Japan and other industrial countries. The insurance scheme will comprise two categories: a mutual assistance system to help small countries in the South Pacific to finance recovery projects, and assistance to countries in the South-east Asian region. It is envisaged that at least 15 countries in the South Pacific, including Fiji, Tonga, Samoa, and Papua New Guinea, will participate and the scheme will become operational by November 2012. It is proposed that the maximum amount of money to be paid out under the disaster damage insurance system will be worked out with reference to the maximum payment of \$120 million for a disaster under a natural disaster insurance system already in place for Caribbean countries.⁵⁰ Japan made the official announcement of the plan during the sixth Pacific Islands Leaders Meeting held from May 25–26, 2011 in Okinawa. Australia, New Zealand, and some members of the European Union will also be making contributions to the proposed insurance scheme.⁵¹

Japan also hopes that the 10 ASEAN member states will take part in the disaster insurance plan, and expects the system to take effect by 2015. Thailand suffered major floods in 2011 and may welcome the idea. It is expected that simulations of damage caused by major natural disasters will be carried out in three countries—the Philippines, Indonesia, and Vietnam—in early 2012. According to the ADB, the Asian region accounts for about 40 per cent of natural disaster-stricken areas in the world.⁵² Many areas in Asia lack sufficient fiscal resources and earthquake-resistance preparations in these countries are also deficient, and, therefore, they are susceptible to social and economic disruptions because of natural disasters. The financial assistance extended directly to disaster-hit developing countries tends to take a long time to reach the affected because of domestic procedures. The insurance system, will ensure that the disaster-hit countries are able to draw on insurance money quickly to rebuild their infrastructure.

Also, private non-life insurance firms will gain more business opportunities, as the funds for the scheme will be reinsured by them. In 2007, a similar disaster insurance scheme was created for countries in and around the Caribbean Sea. Sixteen nations participated in the scheme for which funds were also provided by Britain and Canada. So far, the insurance funds have paid out \$32 million for damage caused by earthquakes and hurricanes. The effectiveness of the planned Asia–Pacific insurance scheme will depend on how many nations and territories join up before it is launched.⁵³ Also, during the East Asia Summit (EAS) meet in Bali in November 2011, Japanese Prime Minister Noda Yoshihiko held talks on the sidelines with the leaders of the Mekong basin nations of Cambodia, Laos, Myanmar, Thailand, and Vietnam to boost cooperation in dealing with disasters.⁵⁴ Noda underscored his government's willingness to make Japan's high-quality

technology and disaster management experience available for the development of the region.

Lessons for the World

The systemic failures that led to the breakdowns in the response to the 2011 earthquake/tsunami were the direct results of in-built weaknesses. These are as listed below ⁵⁵:

- Lack of political leadership.
- Delayed response of the central government to the disaster.
- Ineffectiveness of non-governmental response.
- Constraints on the military.
- Inefficient communication system.
- Socially vulnerable people.

Lack of coordination, lack of communication, lack of ability to make decisions—are all fundamental systemic flaws that need to be accepted and resolved if an effective response management capability is to be developed. Systemic failures in disaster response management are entirely predictable and can be resolved if there is effective leadership, clear vision and appropriate levels of support and funding. Japan needs to learn from the March 11, 2011 experience so that it can be better prepared in the future. Japan did have the technological, financial, administrative, and military resources to deal with the situation which was highly predictable, yet its response management capability was found wanting. It is not only Japan that needs to learn from this experience, but it is a lesson for the world as well.

For effective disaster management, it is important that all functionaries of the central government, provincial governments, designated public corporations, and even private citizens understand their roles and work these out appropriately.⁵⁶ Japan's experience of disaster mitigation can be shared with other countries, taking into considerations local conditions in those countries.

Notwithstanding the shortcoming in Japan's disaster management response to the March 11, 2011 event, the Japanese government did its best under the circumstances. Firstly, Prime Minister Kan lost no time in addressing the nation assuring of the government's best efforts to address to the crisis. Secondly, it was quick to assess the damage. The damage to two of its nuclear reactors was quickly analysed and experts from the US were flown in to help correcting the problems. Thirdly, people around Fukushima were evacuated and the rescue and rehabilitation operations commenced in full swing. These were commendable efforts. It is difficult to assume that given the situation, any other prime minister would have done better than Kan.

The challenge of rebuilding and reconstructing the areas affected by the earthquake and tsunami is so huge that there cannot be any quick-fix solution. Neither the Kan government nor the present Noda government can be held solely responsible if there were/are any shortcomings in their governments' disaster management responses. It will be premature to come to any substantive conclusion on where the governments were found wanting. The challenge of disposing the mountain of debris is enormous, and may take years. Rebuilding houses for the affected people and rehabilitating them are other challenges. With the prolonged economic slowdown and negative growth, finding funds for reconstruction activities is another challenge, particularly when the DPJ does not have a majority in the Upper House and obtaining the approval of the Diet is tricky. Also, given the public sentiment against nuclear energy, the government faces the critical dilemma of strategising the country's future energy policy. The three aspects of the disaster—earthquake, tsunami and the nuclear accident—are inter-related and the challenges that the government faces need to be addressed accordingly. The government can draw lessons from the March 11, 2011 experience so that it can be properly equipped with suitable and appropriate guidelines for designing and planning future projects.

Lessons for India

India is no exception to natural disasters. Can India draw any lesson from Japan's experience? Like Japan, India too has had its own share of natural calamities. The cyclone in Orissa in 1999, the Bhuj earthquake in 2001, the tsunami of 2004, the earthquake of 2005 in Kashmir, and the September 2011 earthquake in Sikkim, are some of the calamities that India has faced in recent years. Each event has displayed an utter lack of preparedness in India. Earthquakes do not come with a warning and that is why being prepared is so critical. In order to meet the challenges of nature, the Government of India established the National Disaster Management Authority (NDMA) by passing the National Disaster Management Act in 2005. Besides state-level Disaster Management Authorities, the government also established the National Institute of Disaster Management

(NIDM) to address the issue of disaster management and disaster response. However, like in Japan, effective early warning systems and strengthening of emergency shelters are yet to be put in place. India also needs to draw lessons from countries like Japan and the US and draw up strong institutional structures that can deal with any disaster that may occur. Disaster preparedness needs strong government backing to ensure quick disaster response.

India ought to move beyond policies and guidelines and towards actual implementation. Disaster planning could be integrated into City Development Plans. The Jawaharlal Nehru Urban Renewal Mission (JNNURM) can play some role in creating awareness for disaster planning and preparedness. Besides creating public awareness, it is necessary to have Special Forces properly equipped with modern tools to handle emergencies so that the a situation like the hospital fire that killed 89 people in Kolkata on December 9, 2011 could have been better handled and the impact of the tragedy could have been lessened, if not fully averted. The government also needs to consider instituting courses on disaster preparedness mandatory in educational institutions to prepare people to respond appropriately in disaster situations. Each disaster, when it occurs anywhere in the world, is often seen as a “wake-up call” and like a “snooze alarm”. People and the government tend to take notice, address the immediate task at hand, and then drift back into complacency. This must change and a long-term vision for the future is the need of the day.



Notes:

1. Some of these events are the 2004 Indian Ocean Christmas Day tsunami (9.2 Richter scale, 231,000 dead), 2010 China Yushu Earthquake (6.9 magnitude, 3,000 dead), May 2008 Burma Cyclone Nargis (138,000 fatalities, though it is believed that this was a severe under-estimation), 2005 New Orleans Hurricane Katrina (around 1,900 fatalities), and January 2010 Haiti earthquake (7.1 magnitude, 300,000+ fatalities).
2. The Seismology Society of Japan was founded in 1880, 25 years before the Seismological Society of America was founded in 1906, following the San Francisco Earthquake, and the first professor of seismology chair at Imperial University (Tokyo), Faculty of Science was established in 1886.
3. The author was participating in a seminar at Hokkaido University, Sapporo, at this time along with two colleagues from the IDSA, and had first-hand experience of the earthquake.
4. Press release, “USGS Updates Magnitude of Japan’s 2011 Tohoku Earthquake to 9.0”, U.S. Geological Survey, March 14, 2011, available at <http://www.usgs.gov/newsroom/article.asp?ID=2727>, accessed on December 6, 2011.
5. U.N. Office for the Coordination of Humanitarian Affairs (OCHA), “Japan: Earthquake & Tsunami”, Situation Report No. 15, March 30, 2011, available at http://reliefweb.int/sites/reliefweb.int/files/resources/0286A99DA691B24CC125786300490AE5-Full_Report.pdf, accessed on December 6, 2011.
6. These were Miyagi, Fukushima, Iwate, Yamagata, Ibaraki, Chiba, Akita, and Aomori.

7. Aliah D. Wright, "HR Professionals, Staffs in Japan Urged to Shelter in Place", Society for Human Resource Management, March 16, 2011, available at <http://www.shrm.org/hrdisciplines/global/Articles/Pages/JapanShelter.aspx>, accessed on December 6, 2011.
8. James Jay Carafano, "The Great Eastern Japan Earthquake: Assessing Disaster Response and Lessons for the United States", *Heritage Special Report*, SR-94, May 25, 2011, pp. 1–13, available at <http://www.heritage.org/research/reports/2011/05/the-great-eastern-japan-earthquake-assessing-disaster-response-and-lessons-for-the-us>.
9. Ibid.
10. Rajaram Panda, "Japan Coping with a National Calamity", March 16, 2011, available at http://www.idsa.in/idsacomment/JapanCopingwithaNationalCalamity_rpanda_160311, accessed on December 7, 2011.
11. Center for Excellence in Disaster Management & Humanitarian Assistance, "Japan Earthquake and Tsunami Update", April 13, 2011, pp.16–17, available at <http://reliefweb.int/node/396159>, accessed on December 7, 2011.
12. Kathleen J. Tierney and James D. Goltz, "Emergency Response: Lessons Learned from the Kobe Earthquake", University of Delaware Disaster Research Center Preliminary Paper No. 260, 1997, available at <http://dspace.udel.edu:8080/dspace/handle/19716/202>, accessed on December 7, 2011.
13. See Global Facility for Disaster Reduction and Recovery, *Natural Hazards, Unnatural Disasters: The Economics of Effective Prevention*, Washington, D.C., 2010.
14. OCHA, "Japan: Earthquake & Tsunami", Situation Report No. 14, n. 5, p. 3.
15. "The Great Eastern Japan Earthquake", n. 8, p. 3.
16. Government of Japan, *National Progress Report on the Implementation of the Hyogo*, Director, International Office for Disaster Management, Cabinet Office, June 4, 2009, available at http://www.preventionweb.net/files/9809_Japan.pdf, accessed on December 8, 2011.
17. Suganuma, Katsutoshi, "Recent Trends in Earthquake Disaster Management in Japan", *Science and Technology Trends—Quarterly Review*, No. 19, April 2006, pp. 91–106.
18. David Dolan and Mark Chrisholm, "Japan Needs Better Tsunami Infrastructure: Experts", 27 March 2011, available at <http://us.mobile.reuters.com/article/topNews/idUSTRE72R0EO20110328?feedType=RSS&feedName=topNews>, accessed on December 7, 2011.
19. Jonatan A. Lassa, "Japan's Resilience to Tsunamis and the Lessons for Japan and the World: An Early Observation", Ash Center, Harvard Kennedy School, available at http://www.zef.de/module/register/media/b4d0_Japantsunami%20resilience31mar2011.pdf, accessed on December 7, 2011.
20. Christof Mauch, "Introduction", in Mauch Christof and Pfister Christian, *Natural Disasters, Cultural Responses*, Lexington Books, Plymouth, 2009, pp.1–17.
21. Lassa, "Japan's Resilience to Tsunamis and the Lessons for Japan and the World", n.19.
22. David S. Abraham, "How Bad Communication is Undermining Japan's Crisis Response", *The Atlantic*, March 16, 2011, available at <http://www.theatlantic.com/international/archive/2011/03/how-bad-communication-is-undermining-japans-crisis-response/72573/>, accessed on December 7, 2011.
23. Ibid.
24. Ibid.

25. Lassa, "Japan's Resilience to Tsunamis and the Lessons for Japan and the World", n. 19.
26. "Message from the Prime Minister on Foreign Aid", March 22, 2011, available at http://translate.google.co.in/translate?hl=en&sl=ja&u=http://www.kantei.go.jp/jp/kan/statement/201103/22message.html&ei=yvPhTqqrE4S0rAfSh_X2AQ&sa=X&oi=translate&ct=result&resnum=3&sqi=2&ved=0CDQQ7gEwAg&prev=/search%3Fq%3Dhttp://www.kantei.go.jp/foreign/kan/statement/201103/22message_%26hl%3Den%26rlz%3D1R2ADFA_enIN372%26biw%3D1267%26bih%3D515%26prmd%3Dimvns, accessed on December 9, 2011.
27. OCHA, "Japan: Earthquake & Tsunami", n.5, p. 6.
28. Center for Excellence in Disaster Management & Humanitarian Assistance, "Japan: Earthquake and Tsunami Update", April 13, 2011, pp. 2, 40, 41–43 available at <http://reliefweb.int/sites/reliefweb.int/files/resources/Japan%20Earthquake%20and%20Tsunami%20Update%2004132011.pdf>, accessed on December 8, 2011.
29. "Kizuna—The Bond of Friendship", April 11, 2011, available at http://www.kantei.go.jp/foreign/kan/statement/201104/11kizuna_e.html.
30. *Ibid.*, p. 2.
31. *Ibid.*, p. 41.
32. *Ibid.*
33. *Ibid.*, p. 43.
34. "Ambassador Akitaka Saiki's message to the Indian readers of 'Japan Calling'", *Japan Calling*, March 2011, p. 3.
35. Drugs and medicines offered by other countries were not accepted because they had not undergone Japanese testing procedures to check for Japanese "uniqueness", and specialist Search-and-Rescue dogs were turned back at the airport because they would have had to go through normal quarantine procedures.
36. The Special Headquarters for Measures to Assist the Lives of Disaster Victims, "Conditions of Lifeline and Infrastructure in the Affected Areas (Mainly in Iwate and Fukushima Prefectures)", April 14, 2011, available at <http://www.cao.go.jp/shien/en/0-infra/infra.pdf>, accessed on December 8, 2011.
37. Rajaram Panda, "Impact of the Earthquake on the Japanese and Global Economies", March 18, 2011, available at http://www.idsai.in/idsacomments/ImpactoftheEarthquakeontheJapaneseandGlobalEconomies_rpanda_180311, accessed on March 19, 2011.
38. "Great Eastern Japan Earthquake, March 11th 2011: A Preliminary Report on the Japanese Government's Disaster Response Management", David Rubens Associates, May 2011, pp. 8–11 at http://knowledgeweb.afac.com.au/_data/assets/pdf_file/0014/40406/Earthquake-Japan2011-Report.pdf, accessed on December 2, 2011.
39. *Ibid.*, p. 9.
40. *Ibid.*, p. 10.
41. *Ibid.*, p. 11.
42. Yoshiaki Kawata, "Disaster Mitigation Due to Next Nankai Earthquake Tsunamis Occurring in Around 2035", Research Center for Disaster Reduction Systems, Kyoto University, Kyoto, available at http://nthmp-history.pmel.noaa.gov/its2001/Separate_Papers/1-08_Kawata.pdf, accessed on December 9, 2011.
43. See <http://www.bousai.go.jp/> for the Japanese Cabinet Office Disaster Management Homepage.

44. The National Disaster Awareness Week, and National Disaster Training Day (on the anniversary of the 1923 Great Kanto Earthquake), and Disaster Management and Volunteer Day (January 17), and Disaster Management and Volunteer Week (January 15–21) are significant dates in the national calendar, ensuring that every school child and office worker should be able to tell you exactly what they should do when the word “Earthquake” is shouted out. See National Report of Japan on Disaster Reduction for the World Conference on Disaster Reduction (Kobe-Hyogo, Japan, January 18–22, 2005), available at http://www.hnisdr.org/eng/country-inform/reports/Japan-report_pdf, accessed on December 9, 2011.
45. For the organizational structure of the Central Disaster Management Council, see Disaster Risk Management Profile, April 2006, p. 7, available at <http://emi.pdc.org/cities/CP-Kobe-April-06.pdf>, accessed on December 9, 2011.
46. Takashi Nagata, “Comparing Hurricane Katrina to Japan’s Kobe Earthquake in 1995: Sharing Policy and Institutional lessons from Two Large-Scale Natural Disasters in the United States and Japan”, available at <http://www.hsph.harvard.edu/research/takemi/files/RP239.pdf>, p. 18, accessed on December 9, 2011.
47. “Constitution panel Must Discuss Disaster Preparedness”, *The Yomiuri Shimbun*, November 9, 2011, available at <http://www.yomiuri.co.jp/dy/editorial/T111118005585.htm>, accessed on December 10, 2011.
48. Ibid.
49. Yasuaki Kobayashi, “Insurance Plan May boost Japan’s Profile”, *The Yomiuri Shimbun*, December 4, 2011, available at <http://www.yomiuri.co.jp/dy/national/T111203003351.htm>, accessed on December 4, 2011.
50. “Japan to Set Up Asian Disaster Insurance Plan/Scheme Covers South Pacific States/ASEAN”, *The Yimouri Shimbun*, December 4, 2011, available at <http://www.yomiuri.co.jp/dy/national/T111203003462.htm>, accessed on December 19, 2011.
51. Ibid.
52. Ibid.
53. Kobayashi, “Insurance Plan May Boost Japan’s Profile”, n. 49.
54. “Japan, Mekong States to Boost Disaster Management Cooperation”, *Kyodo News*, November 18, 2011, available at <http://english.kyodonews.jp/news/2011/11/126967.html>, accessed on December 2, 2011.
55. Nagata, “Comparing Hurricane Katrina to Japan’s Kobe Earthquake in 1995”, n.46.
56. Taiki Saito, “Disaster Management of Local Government in Japan”, available at <http://www.hyogo.uncrd.or.jp/hesi/pdf/peru/saito.pdf>, accessed on 9 December 2011.