



**PRACTICAL OBSERVATIONS ON  
POSSIBILITIES FOR PPP IN DISASTER RECOVERY AND RISK MITIGATION  
CASE STUDY TSUNAMI, JAPAN**



**We encourage all those who deal with Public-Private Partnership far away from disasters to take notice of this report; this is as close you will probably ever get.**

**On the Visit of the UN led delegation to the tsunami affected region of Japan on the role of PPP in disaster recovery and risk mitigation.**

**Japan is an active member of UNECE PPP community with a vice chair in the PPP Team of Specialist. UNISDR and UNECE are working closely together also on the topic of Public-Private Partnerships, PPP. Involvement of the private sector in Risk Reduction is a well know area and much has been put in place to make this successful.**

**But there has been hardly any practical experience on PPP and rebuilding a devastated country which has to find a balance of recovery investments as well as preventing efforts. Many theoretical models have been designed; may conference and discussions paved the way for this experiment.**

**UNISDR. UNECE and Japan saw in this tragically event an opportunity to witness what would happen with Public-Private Partnership the moment a country has been devastated and the first recovery has set in motion. The report is not on how to do PPP's, not to invent new model but to witness what happens or to judge in any way the actions and measures taken by the country of Japan, or partner, which were significant.**

**This report is prepared to learn from, how dreadful and painful in many cases, and use these experience do better, each time when a disaster happens, for us and our children. All those who worked on this report showed courage to discuss improvements and learning suggestions while working immensely hard and dedicated to recover from recent mayhem.**

**We encourage all those who talk about Public-Private Partnership in a safe and secure environment, far away from disasters to take notice of this report; you probably never get closer to reality on PPP.**

**Palais des Nations, Geneva, 31 March 2012**

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## Executive summary

What has happened on 11 March, 2011 was a sad tragedy for Japan, especially northern Japan.

The United Nations Economic Commission for Europe (UNECE) and the United Nations International strategy on Disaster Risk Mitigation (UNISDR) with the support of Toyo University on 15-18 November 2011 dispatched the mission to Tohoku (northern Japan) to observe what has happened and to explore the role of PPP in the process in disaster recovery and how PPP practically can be used in the Japanese recovery process.

The mission has researched the facts on the disaster, which includes what could happen in other parts of Japan with significant size of earthquake and tsunami in Chapter I.

Chapter II assesses the situation: role of and the way forward for Tohoku and Japan. We have examined 1) the overall policy that offers vision, leadership, effective coordination and implementation, 2) building safer and more resilient infrastructure, 3) sustainable development (renewable and smart cities) and green growth, 4) forging regional economic competitiveness and 5) PPP and building local and national PPP capabilities.

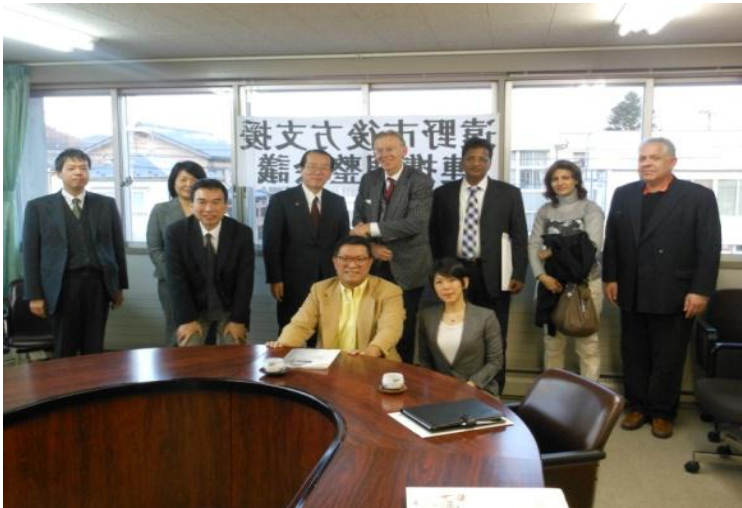
Chapter III contains the key recommendations to the country of Japan and other nations with threat of earthquake and tsunami. The recommendations are bold and aggressive but we all felt they could save the lives and assets of the citizens of the countries.

The country of Japan was prepared for disaster and has done a significant work toward *fukkyu* (recovery) and *fukko* (redevelopment) for the citizens of Tohoku and Japan. However, the mission has examined what other methods and systems using PPP could save more lives and assets of citizens in times of disaster and assist the recovery and re-development in post disaster.

Unfortunately, the disasters will happen. It was fourth significant tsunami disaster in 107 years in Tohoku. It will happen again with global weather change. We sincerely hope that this report provides some useful recommendations for not only Japan but also for the countries, which have such possibilities of earthquake and tsunami to save lives and assets of the citizens.



**The working meeting with Vice Mayor of Sendai, Miyagi**



**Meeting of the UN-led mission with Mayor of Tono City, Iwate**

The members of the mission:

1. Geoffrey Hamilton, Chief of the Cooperation and Partnership Section UNECE
2. Nobuyuki Nagata, Deloitte
3. Akira Morimoto, Expert, International Recovery Platform
4. Khalid Mehmood Shaikh, Director Public Private Partnership Unit, Sindh, Pakistan
5. Arthur Mitchell, Senior Counselor, White & Case Japan
6. Yoshie Muramatsu, Senior Project Manager, Arup, Japan
7. Yuji Nemoto, Professor, Toyo University
8. Sam Tabuchi, Professor, Toyo University
9. Yu Namba, Senior Research Staff, Toyo University

**PPP Recommendations:**

To move forward to use PPPs will require considerable governmental creativity , new thinking and better capacity, coordination between local and a national 'will' to build back 'bigger and better'. This chapter presents the delegation's key recommendations for use of PPP in reconstruction are:

- ✓ Better National coordination
- ✓ Greater use of outsourcing
- ✓ Better financing (e.g. infrastructure funds)
- ✓ Improved resilience of hardware and software in disaster recovery and risk mitigation
- ✓ Wish list of projects (most local authorities said they wanted jobs and new factories but to do what)
- ✓ Local governance and monitoring of contracts

# Chapter I      Effect and key learning from the earthquake and tsunami in Japan

## I. Introduction

The UNECE in collaboration with Toyo University, organized several delegations in 2011 in order to find the roles of Public-Private Partnerships in the event of large-scale disaster. The delegations have met many municipal, regional and national government officials and private sectors during their visit to the affected areas. Through the visits, the delegations were impressed with such tremendous jobs been done in response and relief. Meanwhile, even though Japan had won their credits in building superb infrastructures and having efficient and strong economic sectors, the country seemed to be bewildered in deciding directions for reconstruction, with the region's economy already struggling added to the large deficit of the country. In this regard, UNECE dispatched delegations consist of PPP specialists to find ways to build back 'better and brighter' through PPP.

PPPs can make a major contribution to the reconstruction is because of the nature of relationship among the public and private sectors—a contractual relationship. The private sectors display their performance in a comprehensive, whole-life, cost effective, and targeted way based on due diligence and “value for money” analysis and an integrated and structured risk management approach. This will drive the projects to be financially viable, economically feasible and sustainable, and avoid haphazard reconstruction of status quo. Its competitive and transparent process ascertains that the projects are carried put in pursuit of quality and best value.

The role of Public-Private Partnership in disaster has long been recognized. It gained a prominence in the United Nations General Assembly's Resolution 236 Session 44 (a resolution designated 1990s as the International Decade for Natural Disaster Risk Reduction); which stated “All governments are called upon to encourage their local administrations to take appropriate steps to mobilize the necessary support from the public and private sectors and to contribute to the achievement of the purpose of the Decade”. After more than a decade ago, the *Kuala Lumpur Declaration*, a declaration adopted at the third Asian Ministerial Conference on Disaster Risk Reduction (AMCDRR), emphasized the importance of “Mobilizing Resources and Promoting Public Private Partnership for DRR”. United Nations International Strategy for Disaster Reduction (UNISDR) has recently organized a platform for Public-Private Partnership in disaster risk reduction.

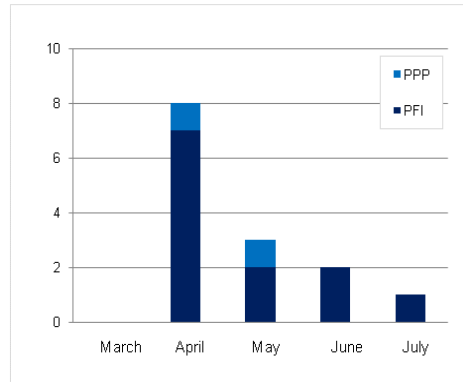
Even with those recognitions, private sector participation in the event of disaster remained short-term relief/response and within the framework of CSR activities. UNECE Team of Specialists on PPP recognizes necessity of private sector's longer-term participation in disaster reconstruction and pre-emptive commitment to mitigate future risks and strengthen economic activities. The UNECE has been active to collect international knowledge and experience in PPP to improve project deliverability and promote best practices. Main contributors of this report are



professionals in public private partnerships in basic service provision and infrastructure developments.

In the Japanese context, many private sectors successfully participated and demonstrated their capabilities in the early response and relief. It has become clear that not only the international community but the governments, policy makers and public sectors have got high expectations on PPP. However, in reality, it is abundantly clear that lack of experience and knowledge in PPP and sluggish economy in the area discourage the implementation of PPP for reconstruction.

Therefore, this report focuses on raising key issues in applying PPPs to reconstruction projects in order to improve PPP applicability and encourage better and brighter reconstruction.



Number of articles mentioned “PPP” or “PFI” (The Nikkei Shimbun from March 11 to End of July 2011)

## II. Affects of the disaster

Around 2.46 pm, 11 March, 2011, a Magnitude 9.0 earthquake shook the eastern Japan. This was the largest earthquake in Japanese history. Even in Tokyo—more than 500 kilometers away from the epicenter—urban functions were paralyzed. But it was the tsunami made the disaster worse.

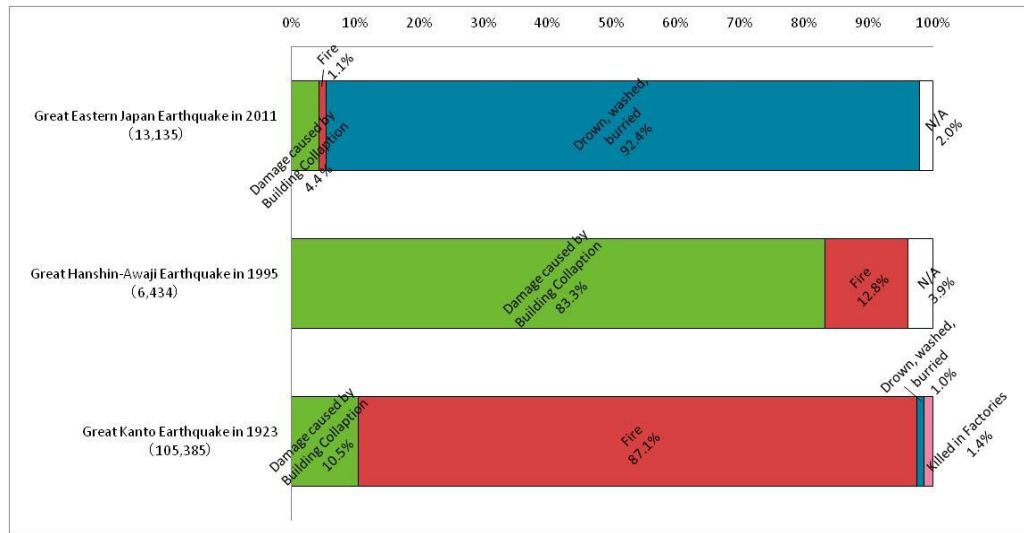
*After about an hour, a TV channel, NHK, started to broadcast the huge tsunami engulfing villages, roads, bridges, cars, and everything on the field. The waves seemed that they would never stop. At this moment, the TV could capture the image of what was going on only in/around Sendai City, the largest city in Tohoku (north eastern) region. But no one could understand the situation throughout the Region. And by the night, people many have sensed that something really terrible might have occurred in Fukushima 2nd Nuclear Plant. This was the first time Japan had faced such a compound disaster.*



NHK Broadcasted tsunami near Sendai City around 4 pm

A total of more than 560 square kilometers (138,600 acres) were blooded, and the tsunami at one point reached the height of almost 40 meters. In this disaster, virtually all the fatalities were caused by the tsunami. Only less than 5% were killed by injuries caused by collapsing structures. Even though there may be a discussion that some or many people might had been trapped in/under the collapse and then killed by the water.

**Figure 1. Causes of deaths in large scale earthquakes**



**Table 1. Comparison of Damages: Great Eastern Japan Earthquake of 2011 and Hanshin-Awaji of 1995, and Estimation of damage in Tokai, Tonankai-Nankai Earthquake (As of December 2011)**

	Great Eastern Japan 2011	Hanshin Awaji 1995	Estimated future earthquakes		
			Tokyo Metropolitan	Tokai	Tonankai-Nankai
Magnitude (M)	M 9.0	M 6.9(7.3)	M 7.3	M 8.0	M 8.6
Seismic intensity	7 (Miyagi)	7 (Hyogo)	6+ Tokyo, Saitama, Chiba, Kanagawa	7 Shizuoka, Yamanashi	7 Shizuoka, Ichi, Mie, Akayama, Kochi
Lost and Missing	20,425	6,437	11,000	9,200	18,000
# of Evacuated (Max)	470,000	320,000	7,000,000	1,900,000	5,000,000
Destroyed houses	110,000	100,000	850,000	260,000	360,000
Economic Damage (trillion yen)	Direct Damage 17	Direct Damage 10	Direct Damage 67 Indirect Damage 45	Direct Damage 26 Indirect Damage 11	Direct Damage 43 Indirect Damage 14

Table 2. Population and Households in inundated areas

Prefecture		Within inundated area		Total		% within the inundated area	
		Population	Household	Population	Household	Population	Household
Iwate	Miyako	18,378	7,209	59,442	22,504	30.9	32.0
	Ofunato	19,073	6,957	40,738	14,814	46.8	47.0
	Kuji	7,171	2,553	36,875	14,015	19.4	18.2
	Rikuzentakata	16,640	5,592	23,302	7,794	71.4	71.7
	Kamaishi	13,164	5,235	39,578	16,095	33.3	32.5
	Otsuchi	11,915	4,614	15,277	5,674	78.0	81.3
	Yamada	11,418	4,175	18,625	6,605	61.3	63.2
	Iwazumi	1,137	431	10,804	4,355	10.5	9.9
	Tanohata	1,582	526	3,843	1,309	41.2	40.2
	Fudai	1,115	380	3,088	1,042	36.1	36.5
	Noda	3,177	1,069	4,632	1,576	68.6	67.8
	Hirono	2,733	932	17,910	6,117	15.3	15.2
Total		107,503	39,673	274,114	101,900	39.2	38.9

Prefecture		Within inundated area		Total		% within the inundated area	
		Population	Household	Population	Household	Population	Household
Miyagi	Sendai-Miyagin	17,375	6,551	190,485	85,790	9.1	7.6
	Sendai-Wakabay	9,386	2,698	132,191	58,891	7.1	4.6
	Sendai-Tahaku	3,201	1,136	220,715	91,585	1.5	1.2
	Isinomaki	112,276	42,157	160,704	57,812	69.9	72.9
	Shiogama	18,718	6,973	56,490	20,314	33.1	34.3
	Kesenuma	40,331	13,974	73,494	25,464	54.9	54.9
	Natori	12,155	3,974	73,140	25,150	16.6	15.8
	Tagajo	17,144	6,648	62,979	24,047	27.2	27.6
	Iwanuma	8,051	2,337	44,198	15,530	18.2	15.0
	Higashimatsush	34,014	11,251	42,908	13,995	79.3	80.4
	Watarai	14,080	4,196	34,846	10,899	40.4	38.5
	Yamamoto	8,990	2,913	16,711	5,233	53.8	55.7
	Matsushima	4,053	1,477	15,089	5,149	26.9	28.7
	Shichigahama	9,149	2,751	20,419	6,415	44.8	42.9
	Rihu	542	192	34,000	10,819	1.6	1.8
	Onagawa	8,048	3,155	10,051	3,968	80.1	79.5
Minamisanriku	14,389	4,375	17,431	5,295	82.5	82.6	
Total		331,902	116,758	1,205,851	466,356	27.5	25.0

Prefecture		Within inundated area		Total		% within the inundated area	
		Population	Household	Population	Household	Population	Household
Fukushi	Iwaki	32,520	11,345	342,198	128,516	9.5	8.8
	Souma	10,436	3,076	37,796	13,240	27.6	23.2
	Minamisouma	13,377	3,720	70,895	23,643	18.9	15.7
	Hirono	1,385	444	5,418	1,810	25.6	24.5
	Naraha	1,746	543	7,701	2,576	22.7	21.1
	Tomiooka	1,401	552	15,996	6,141	8.8	9.0
	Okuma	1,127	359	11,511	3,955	9.8	9.1
	Hutaba	1,278	402	6,932	2,393	18.4	16.8
	Namie	3,356	1,006	20,908	7,171	16.1	14.0
	Shinchi	4,666	1,400	8,218	2,461	56.8	56.9
Total		71,292	22,847	527,573	191,906	13.5	11.9

...the impact of the tsunami affected both the social infrastructure: hospitals, schools, houses... as well as the economic livelihoods of the local populations...



*(Top left) An elementary school hit by tsunami and burned fire while inundated, (top right) A hospital flooded to second floor, (second left) Inside of a flooded police headquarter in Kamaishi, (second right) Inside of a public works building in waste water treatment center in Otuchi, (left) Destroyed railways were carried to residential area, (bottom left) Full of debris in central commercial district, (bottom right) An isolated shopping street looks like a “ghost town”*





### Many Municipal governments got paralyzed

Municipalities are the first in the list to be responsible for securing the lives and supporting citizens. However in this event, some municipalities totally lost their functions, and many lost partially. In Otsuchi town, officials gathered in the front yard of the town hall for meeting on disaster reaction. tsunami wiped the town hall, killing one fourth of management-class officials, including Mayor.



**Town Hall of Otsuchi where Mayor and many officials got killed in the front yard**

In Rikuzentakata, many young officials were killed, leaving heavy loads of works to management-class officials. Some members of the mission visited the City in July, and in a brand-new temporarily administration office building, Director of the disaster management only had two files as all of his record and information on public services, which he has been keeping after the earthquake. All the information prior to 11 March was lost, and newly installed shelves were still empty. The City was struggling to retrieve these records. The Director told us that the City had lost residents' records, and still could not track all the survivors. In addition, they only had tax-record as of Fiscal Year 2009 (as of March 2010), which they reported to prefectural government the previous year. Since the earthquake occurred in the very end of FY2011, most individuals had not filed their tax records, and even the entities which they kept the companies' and employees' records have lost them all. Not knowing how many survivors were remaining within the city, would be willing to come back to the city or how much taxes they would pay, were they not able to draw a future reconstruction plan of the city.



**Rikuzentakata city hall was destroyed completely (above) and temporarily city hall (below)**

While local government officials' duties have multiplied during disaster response/reaction, no prefectural governments or national government could respond to these local governments' situation in the earliest stage. This was because of the failure of disaster response system. The system is designed that municipal government under the damage bears a primary responsibility of rescuing and protecting citizens' lives and properties, but never assumed the loss of government head or paralysis of local government functions. Thus, no system sufficiently supported to fulfill the human resource demands, especially in middle to long term.

Not only municipal functions, but other functions of the towns were also lost. Most local business and commercial districts were hit by the tsunami and banks, supermarkets, gas stands and the others were destroyed. Because most people lost places to work or shop, even those who did not get their house flooded, were hardly able to support their lives.

**However it was not altogether a disaster story.....**

The early warning technology for the railways worked well. There was no derailment of the train. Since the 2004 Mid-Niigata Pref. Earthquake, 50-60 billion yen has been invested in earthquake disaster prevention measures. Within the JR East area, earthquake measurement equipment has been improved and increased, and the time from early tremor detection, to electric supply cut has been reduced from 3 to 2 seconds. Seismographs at 62 locations were upgraded to the latest models in 2005. New seismographs were installed at 28 coastal locations in 2006. By 2009, all carriages of the Tohoku Shinkansen were fitted with an early earthquake warning system.

While towns were destroyed almost totally, only around 3 per cent of the overall population living in the towns lost their lives. Most children survived in Kamaishi City. Participatory disaster education for elementary school children (with teachers) worked very successfully. Children followed the saying, "*Tsunami Tendenko*", literally means, 'in a tsunami, flee separately.'



**In Kamaishi City 99.8% of school kids survived**

### III. Actions taken

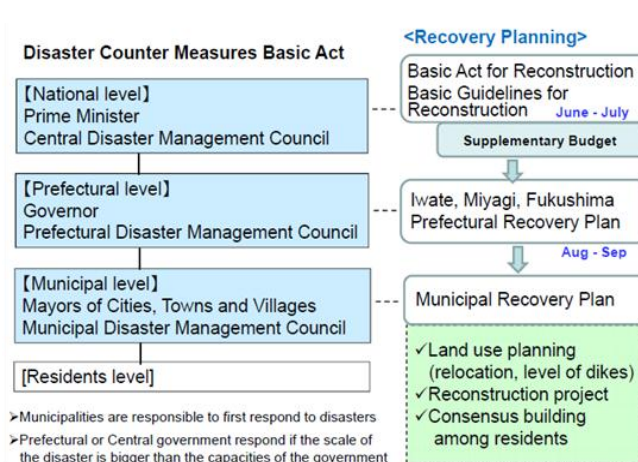
#### 1. Slow but gradual progress

Many municipalities in the affected areas seemed to struggle preparing and implementing reconstruction plans and projects. Many municipalities seemed reluctant to change land-use drastically, while some seemed to struggle obtaining consensus or agreement from residents. Some seemed simply struggle with lack of know-how and human resources.

However, even one of the worst hit municipalities has making progress (See Appendix 1). Minamisanriku, a town with 17,431 (2010 National

Census, Approx. 30% over 65 years old) , which lost about 40 of its 160 officials in tsunami, has published a reconstruction plan. The town envisions future of the town as safer, greener and lively community. The cost estimate of these programs sums up to 20 years of the town’s budget in

**Recovery/Reconstruction planning process according to Disaster Countermeasures Basic Act.(provided by Mr. Sanjaya Bhatia of International Recovery Platform –UNISDR)**



**Town’s future vision—Connecting nature, people, work, safety, and prosperity—**

**Minamisanriku Town Disaster Recovery/Reconstruction Plan**

**1. Community building for a place where we can continue to live and feel safe**

(ex. Safe land use, development plan for better risk management and mitigation, strengthen disaster management systems, safer modal networks, establish information system networks, secure medical, healthcare and welfare, concentrating public facilities and its functions)

**2. Community building for living together with nature Process**

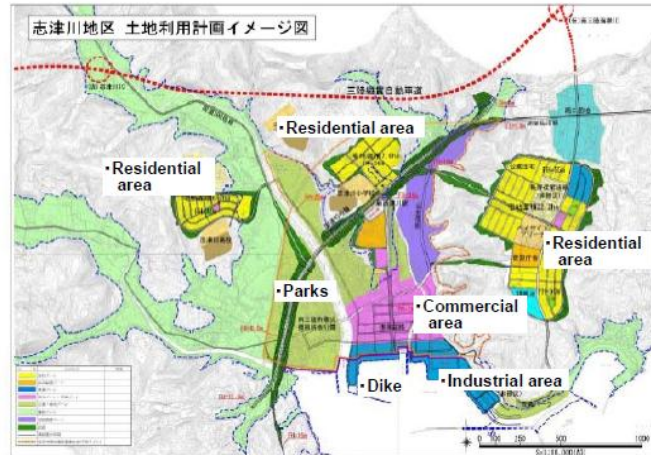
(ex. Installation of Eco-town, development of renewable and sustainable social system, creation of new lifestyle, human resources development and community empowerment)

**3. Community planning for a flourishing town and livelihood**

(ex. Early recovery of industrial infrastructures, rehabilitation and revitalization of fishery industry, utilization of agricultural land and forest, revitalization of commercial and tourism industry, create new employment and population growth)

2010. (total of 160 billion yen while the budget scale of the town was only 8 billion yen)

The town had heavily depended on fishery (a little shy of 20% worked in fishery related industry), thus the radical change of land use –i.e. prohibiting fishermen to live close to ocean seemed unlikely. In addition, the town had one of the weakest economy and financial condition in Miyagi Prefecture.



Source: Home page of Minami Sanriku Town

## 2. New Method Employed

The town now tries to implement projects for recovery of the social infrastructures in an innovative way. The town contracted out “Support for implementation plan of reconstruction projects to Pacific Consultants, Nakaba, Land Brain, Pasco JV. This contract includes both program and project management of planning of urban development projects, relocation planning and consensus building, design, land survey, planning, cost estimate of construction, study of cost- and time-saving method of construction, suggestion of how to select private entities, deciding specifications, and management of public finance for these projects. Program management or project management in construction projects are not common in public works projects in Japan, where most of these managements were done by public bodies. The town decided to contract out these functions for effective and faster implementation of projects.

Ministry of Land, Infrastructure, Transport and Tourism also announced to apply program or project management, and construction management in some major reconstruction projects. These innovative procurement and management methods would enhance implementation of PPPs in the region.

## 3. “Partnerships” in disaster

In this earthquake and tsunami, many municipalities got paralyzed and lost their functions. Municipalities bear primary responsibilities for securing its citizens and properties, but an extremely severe disaster like this can easily overwhelm the capacity. Thus, it is accentuated that public bodies should prepare partnerships. Our delegation have found that many forms of partnerships; vertical or horizontal worked quite efficiently or effectively and encouraging.

Vertical partnerships in public bodies refer to partnerships among different levels of governments, such as national government and prefectural governments or prefectural governments and local



(municipal) governments. On the other hand, horizontal partnerships take place in same level of governments, prefectural-prefectural or municipal-municipal.

### **Case 1: National arrangement for municipal government support**

Ministry of internal affairs and communication established a scheme to send officials to devastated municipalities. 72,900 national government officials and 79,000 prefectural and municipal government officials have been sent to prefectural and municipal governments in the devastated area.

Even though Japan national government has been seemed to be very reluctant or unwilling to assign particular prefecture or municipalities to ones in needs, it established a scheme for mid- to long-term assignment of officials in collaboration with the National Governors' Association, the Japan Association of City Mayors, and the National Association of Towns and Villages. For the future large-scale disasters, national government should take

### **Case 2: Remote logistic support**

City of Tono in Iwate Prefecture gained a great reputation for providing effective support for affected areas. A city of 30,000 population located in the middle of inland-highways and coastal devastated areas, and has great access to many of the affected cities. Thus, Mayor of the City, Mr. Toshiaki Honda had planned to set up remote logistic support base in the city when this kind of enormous disaster strike the region. Tono city and neighboring cities and towns on the coast established a committee for setting up and building necessary facilities to provide logistic supports. Even though the plan for construct necessary building had not realized, Tono city and related organizations including prefectural government, Self Defense Force, police, fire and other rescue and relief organizations conducted emergency drills for large-scale disasters. The city opened a soccer field and play grounds for Self Defense Force and other rescuing organization to station. More than 3500 officials and rescue crews gathered to Tono within first ten days. The City also provided a gymnasium and community centers for storage of relief goods and accommodation for volunteers. Citizens in the city also volunteered to provide about 140,000 hot meals in 50 days.

**Volunteers accommodated in Tono. Tono Social welfare council and a NGO organized and managed the volunteers' activities.**



### Case 3: Counterpart support system

Right after the earthquake, Union of Kansai Governments, an alliance of 7 prefectures in Kansai (south-western part of Japan), decided to send DMATs and public officials to 3 devastated prefectures, assigning two to three prefectures to each devastated prefectures. They Decided to adapt a “Counterpart system,” which is to pair certain prefectures to specific affected prefectures in order to avoid overlapping or shortfall of support. Osaka and Wakayama Prefecture have been assigned to Iwate Prefecture, Hyogo, Tottori and Tokushima Prefecture have been assigned to Miyagi Prefecture, and Kyoto and Shiga Prefecture have been assigned to Fukushima Prefecture. This counterpart system i.e.

pairing of prefectures enabled better communication and long-term and sustainable support to devastated municipalities. City of Osaka have set up Headquarter in City of Kamaishi, and have provided general clerical support, logistics, public health, disaster inspection, medical care, welfare, temporary housing, educational support, volunteer coordination, shelter management, and debris handling.

#### Osaka City’s headquarter in Kamaishi City



### Case 4: Setting up headquarters

While Union of Kansai Governments aimed to long-term support, Shizuoka Prefecture, which is known for its high risk of earthquake and tsunami for years, showed its preparedness and systematic correspondence in relief and recovery phase. The prefecture set up support headquarters in City of Tono, which is about 50 kilometers away from many of the devastated municipalities in Iwate Prefecture. They decided not to set up headquarters within Iwate Prefectural Government Office, which is more than 1 hour away from these severely damaged cities and towns, but choose to have better access and mobility. They sent many cars, fuels, and officials using air freight, so that they could independently establish a means of transporting relief goods directly to shelters, whereas many supporting municipalities did not have the mobility. This also enabled to select and send most-needed goods by conducting hearings directly to evacuees in shelters, and avoid sending unnecessary goods or occupying storage spaces with these unwanted goods. They also provided technical support for recovering social infrastructures, clerical support, shelter management, physical and mental healthcare, and others. These activities were intended to make the affected municipalities back to independently handle their duties as early as possible.

These kinds of headquarters have proved better communication among affected public bodies and supporting bodies, faster decision making, better mobility, quickness and flexibility.

Another conspicuous activities Shizuoka Prefecture has is that they have a “Plan for receiving wide-area support,” in which they list all the necessary supports in a massive disaster and list

potential organizations which would provide these supports, and how, when and where they gather and provide services. This plan would enable local government bodies to identify necessary supports, resources within/outside of the region, and efficiently allocate them. One of the investigation committee of Central Disaster Management Council<sup>1</sup> suggested the national government and cabinet to introduce and promote the “receive plan” concept to municipalities and prefectural governments.

#### 4. Public-Private Partnerships

While some partnerships among public and public entities worked out quite well, partnerships among public and private entities have proven its effectiveness. Some of the functions which affected municipalities are expected to provide can be provided better by private entities. (e.g. management of relief goods and logistic centers, providing communication devices, record keeping, catering, operating shelters etc)

##### Case 1: Disaster agreement and Operation Comb

One unique activity in Japan to utilize private sectors in early phase of disaster, is a system called disaster agreement. A private company and a public body sign agreement on disaster relief activities.

Our delegation visited Tohoku Regional Development Bureau (TRDB) of Ministry of Land, Infrastructure, Transport and Tourism, and learned that the disaster agreement among TRDB and local construction companies functioned quite effectively. Several hours after the disaster, TRDB judged the severity of the tsunami damage and decided to deploy about 60 teams (from 29 companies) for road clearance. In Tohoku region, main access routes run inland through north to south. In order to gain access to the devastated cities on the coast, TRDB decided to clear up rubbish on 15 most crucial access routes.

It is reported that many local construction companies voluntarily gathered to offices of TRDB, and asked for instructions, because telephones and other communication devices got cut off. These private sectors also brought information on the damages in the devastated area, which helped TRDB to precisely plan

**In TRDB’s Emergency Management Headquarter and monitoring room. Mr. Kawashima, Director of policy and planning section**



<sup>1</sup> The Central Disaster Management Council is one of the councils that deal with crucial policies of the cabinet and is established in the Cabinet Office. The council promotes comprehensive disaster countermeasures, verify the actual countermeasures in major disasters and employ the lessons learned to future disasters.

and allocate resources. Tohoku Branch of Japan Federation of Construction Contractors (JFCC) had disaster agreement with each of six prefectures in the region, City of Sendai, and TRDB. Assuming the high probability of mega-scale disaster, JFCC and other parties had agreed to consolidate these agreements and appoint TRDB as a single point of contact. In this way, they succeeded to avoid confusion, redundancy, and delay. Private sectors often have disaster agreement with many municipalities where they have business with, thus they may get confused if a large-scale disaster occurs. Thus, it is crucial to appoint single point of contract in massive disaster. TRDB, JFCC and Japan Road Contractors Association also procured and distributed relief goods, heavy equipments, daily goods, and pre-fabricated buildings to be used as city halls and emergency management headquarters.

Disaster agreements are also rewarding to private bodies. In construction industry, construction contractors can gain some points in comprehensive bid evaluation. This way, public bodies often encourage private sectors to sign disaster agreements.

### **Case 2: Debris handling**

Our delegation visited debris segregation and handling site operated by a joint venture consists of *Sangyoshinko*, *Kajima*, and *Takeei* in Kamaishi City. This segregation plant is designed to collect and handle 38,000 tons of debris in first several months, and expand its capacity. Debris were handled in the plant, and woods, plastics, metals, concrete, electronics, and dangerous goods are thoroughly segregated. About half or more of the debris became recyclable or reusable. The joint venture also installed a radiation inspection at their own cost in order to correspond to rising concern among citizens. They also contributed local economy, hiring locals who lost their jobs in the disaster.

Even though this project was procured in traditional way, it started by private sector's initiation. Japan Project Industry Council (JAPIC), a council of general contractors and steel companies, established a committee to examine how to segregate reusable items from muddy debris. They made proposal to national government and municipal governments how to segregate debris and estimated the cost. Ministry of Environment prepared budget for debris handling, and City of Kamaishi solicited a model project.

## Chapter II      Assessment of the situation and the role of PPP in leading the way forward for the Tokohu region

### The general thesis of the chapter

*PPPs can make a major contribution to recovery. Rather than pouring money wastefully into the region in a haphazard way, the PPP approach in a cost effective, targeted and comprehensive way which can make sure that the rebuilding is economically efficient and sustainable: 'Building back better and brighter'. What needs to be avoided is the commencement of a host of infrastructure projects in places that do not need them and /or have not met 'value for money' benchmarks. Such projects can become a 'drain' on the economy, adding to the Japanese deficit and accelerating regional economic decline. PPP in the region could by contrast be linked to 'green growth' and approaches that are sustainable, cost-effective and competitive to the regional economy.*

### I. 'Fukkyu' or 'Fukko'?

One of the members of the international UN delegation, head of the PPP Unit of Singh in Pakistan has considerable first-hand knowledge of the devastation caused by earthquakes. When visiting the tsunami affected region—the many little towns on the attractive coastline of north east Japan that were once full of life and buzzing with activity—he was asked how the devastation he was witnessing compared with what he had seen in Pakistan. His reply was: 'This is much worse'. Literally whole towns, communities, businesses had been wiped off the face of the map and will have to be reconstructed, that is not individual separate dwellings, schools or hospitals but quite simply, everything.

In the task of reconstruction it is noticeable that there is a clear difference in views between the residents who have survived and the policy makers. Many of the former group wish to restore things to the way they were prior to the disaster (fukkyu), while in contrast many of the local leaders with a more intimate knowledge of the region as a whole , think that the region must be reconstructed (fukko) in new ways.<sup>2</sup> Fukkyu or Fukko?

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<sup>2</sup> such as Governor Murai of Miyagi

The policy of recreating what was exactly there before (fukkyu) is not tenable—even if it was feasible. Economically the region is in structural decline. It desperately needs a vision that will usher in significant, new economic activities. It badly needs such activities to support an ageing population and a young generation who, to date, has been leaving the region in search of better jobs and livelihoods in the cities. (See box) Policy makers have the huge task of not only coming up with such a new vision but also of trying to create a consensus amongst citizens many of whom have lost everything, on the path to take the region forward.

### **The economic structure of the Tohoku region**

*Prior to the disaster, Tohoku did not loom very large in the minds of most Japanese, let alone foreign observers, due to its image as an area mainly devoted to farming, fishing, forestry and some tourism. However the worldwide supply chain disruptions that occurred in auto parts, electronic components, semi-conductors and other products reminded us all that Tohoku plays a critical role in the world economy. The downturns of GDP growth or exports in several countries after the earthquake were even severer than that of Japan. It has an important industrial and technological base.*

*But it also faces many challenges. While six prefectures directly experienced the affects of the earthquake and the tsunami, Miyagi Prefecture alone suffered about 60% of the damage in terms of loss of life and property damage. Fukushima Prefecture encountered a meltdown of one of its nuclear reactors and severe damage to three others. The total population of Tohoku is approximately 9.8 million people but the average age of most of the population is in excess of 60. Per capita annual income is 3.5 million yen (U.S. \$44,000 @\$1:80 yen). The dual structure of its economy—both leading edge technologically and rural and poor—means that, in some ways, Tohoku is both backward and forward looking at the same time.*

The purpose of this report is to set out a road map for the region to reinvent itself and to demonstrate how PPPs can be used to this end. The aim is to ‘build back better and brighter than before’, that is, to make the regional economy more competitive and to achieve higher rates of economic growth, taking account as well of the need to reconstruct after the disaster and to address the special challenges of finding the necessary financial resources that this task entails.

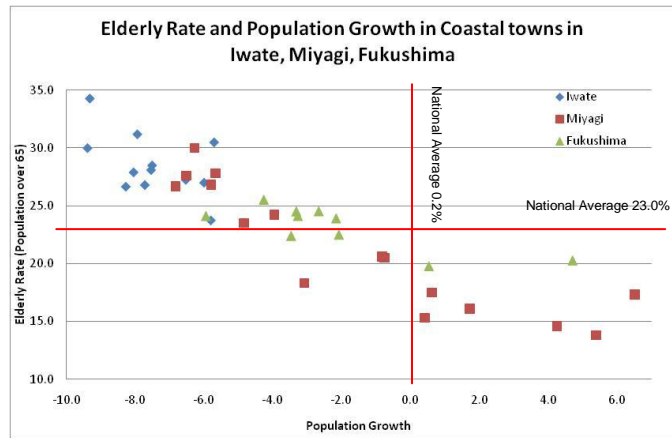
### **This chapter reviews:**

1. Some of the challenges facing the regional economy
2. What is required in the task of reconstruction
3. The progress of the country and the region in meeting these requirements



**Current Condition: Decreasing/ageing population and a struggling economy**

The population was rapidly ageing and decreasing in most damaged cities, towns and villages (right). 54% of the dead were over 65. The City of Kamaishi, Iwate enjoyed its zenith in the 1970's, based on a strong iron industry. The population reached 90,000 in 1980; by 2010, this figure had halved and of that the share of the elderly jumped to 31.2%.



Most towns and villages on the Sanriku coast heavily depend on fishing-related industry and tourism. Even though fishing and aquaculture are coming back gradually after the tsunami, there is a lively debate on whether or not to redevelop the port and restore it to its original state.

One reason is that the fishing industry in the area has been struggling because of both the decline in the size of the fish catch and stagnation in fish prices. A fishing cooperative in tsunami-hit Otsuchi went bankruptcy on January 13, 2012. The cooperative had owed more than one billion yen, even before the earthquake. 672 fishing vessels were destroyed by the tsunami, and three fixed fishing nets were wiped out. The total fishing-related damage for the cooperative reached 5.1 billion yen. This is the case not only of Otsuchi. One newspaper reported that 22 of 24 fishery cooperatives in Iwate prefecture are losing money because of the deterioration of marine resources, the ageing of the fishermen, lack of successors, as well as the obsolescent structure of the cooperatives.



**Fish market in Kamaishi**



**Many fishing vessels washed up on shore (left), and fixed fishing nets destroyed (near Otsuchi)**

Another reason is that the objections from the fishing cooperatives and fishermen. Many cities/towns have written into their reconstruction plans that they will restructure the fishing industry in some innovative ways and make the industry stronger. In May 2011, the Governor of Miyagi Prefecture announced the creation of a “Fishing reconstruction special zone”, in which the prefecture encourages private sector participation in aquaculture. Even though this concept is written in national fishing redevelopment plan, many fishermen and fishing cooperatives were opposed to the restructuring of the fishing industry in such an innovative way.

There is indeed a lesson that should be learned from the past. In the island of Okushiri, which was struck by a tsunami in 1993, the government tried to restructure the fishing economy, spending billions of yens on building a levee, fishing port with a huge structure of artificial ground for fishermen’s refuge, and an embankment to move houses from the shore. A fishing cooperative in Aonae, an area which had most severe damages, was struggling from declining catches even before the tsunami, and its catch never recovered with all these huge investments. The number of fishermen on the island has dropped to under 200 from more than 400 at the time of the tsunami, according to the Ministry of Agriculture, Forestry and Fisheries. In a decade or two, it is probable, many of the fishing ports of the Tohoku region, might follow the same road as Okushiri.

Thus the timing is right for a serious reconsideration of the region's economic future.

## II. The key actions required for reconstruction

<b>Five point Action Plan</b>
1. Policy and institutions
2. Security and safety
3. Green economy
4. Economic competitiveness
5. PPP

Based on the evidence collected by the delegation during the mission to the region in November 2011 and taking into account the experiences of many recent natural disasters around the world



such as Hurricane Katrina<sup>3</sup>, the 5 following points or 'action plan' are especially recommended to 'build back better and brighter' :

1. Establishing a policy that is built on a coherent vision, strong leadership and good coordination that results in an effective implementation;
2. Rebuilding a safer, more resilient infrastructure;
3. Building an economic future that is sustainable, based on 'green growth ', the 'green economy', some new industries and new 'smart' cities;
4. Forging regional economic competitiveness (open markets, deregulation and liberalization) that translate into a more prosperous region with better quality jobs, higher standards of care, education etc. for all citizens; and
5. Using PPP as a model for rebuilding infrastructure and delivery of public services.

All these aspects are interconnected and have as a common denominator the need to restore confidence in the region's future amongst the local communities, the country and in particular the investor and business community. These actions also need to follow one after another if they are to promote confidence amongst investors.

Overall, policy is needed to give predictability and 'certainty' to the investor. The investor too must be assured that to the maximum extent possible, the infrastructure will be able to withstand future tsunamis and other natural disasters. The business community will also be attracted to the investment opportunities from new fast growing industries that are linked to the 'green economy'. In addition, the conditions for doing business need to be attractive and competitive in relation to other locations in Japan and outside the country where there are many alternative places investors can go. Bringing these actions together through building a world-class modern infrastructure through PPP is also an important component of the revival.

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<sup>3</sup> There is a considerable literature on the impact and measures needed to address these catastrophes. See the following website for some of the important contributions...

## **How are Japan and the region currently performing in these Five areas?**

### **1. Overall policy that offers vision, leadership, effective coordination and implementation**

#### **(i) Bureaucracy and policy making challenge**

Since Japan is a democracy, elected officials should naturally play a role in determining which policy options will be turned into reality in accordance with the national interest. For almost 50 years, the Liberal Democratic Party (“LDP”) controlled the government through its majority in the lower house of the Diet. The LDP’s rule was broken when the Democratic Party of Japan (“DPJ”) obtained a majority in the 2009 general election. Under the LDP administration, policy issues were handled rather smoothly between the politicians and the career bureaucracy, often with the latter taking the lead in setting the agenda and implementing policies once the appropriate laws were passed by the legislature. Individual ministries also had the final word on most matters within their jurisdictional domains (*tatewari gyosei*, i.e. sectionalism), making decision-making on cross-cutting issues extremely difficult and time consuming. The DPJ tried to establish a national strategy office under the Prime Minister as a way to bring ultimate policy decision-making under one roof but this exercise ended in failure. The DPJ also made “oust the bureaucrats” (*datsu kanryo*) from policy making as one of its main campaign slogans, as a way to bring more democratic accountability to the legislative process. In the aftermath of the 3.11 disaster, the DPJ found it nearly impossible to work without the full cooperation of the bureaucracy.

When the DPJ lost the upper house election in 2009 and ceded control of that body to a coalition of opposition parties, legislative initiatives became extremely difficult, with the opposition in the run up to the disaster calling for no-confidence votes against important DPJ ministers and otherwise blocking new legislation. Following the disaster, there was a brief period of national unity when none of the political parties wanted to be seen as obstructing measures to provide relief and recovery of the Tohoku area. This period culminated with the passage of two bills (the Renewable Energy Law and bill to finance government debt) which Mr. Kan pushed through in exchange for his resignation as Prime Minister.

#### **(ii) Setting priorities for reconstruction**

On 14 April 2011, Prime Minister Kan convened the Reconstruction Design Council in Response to the Great East Japan Earthquake (the “Design Council”), under the chairmanship of Professor Makoto Iokibe of the National Defense Academy, and charged it with the duty to formulate guidelines on reconstruction in the affected regions. On 25 June 2011, the Design Council published its Report, which stated that seven principles should guide the Reconstruction Framework (see box)

### Seven Principles for Guiding Reconstruction

1. remember the tragedy by creating memorial forests and monuments and examining the causes and lessons learned;
2. make community-focused reconstruction the foundation of efforts toward recovery with the national government supporting reconstruction through general guidelines and institutional design;
3. pursue forms of recovery and reconstruction that tap into the region's latent strengths and lead to technological innovation;
4. construct disaster resilient safe and secure communities and a natural energy-powered region;
5. simultaneously pursue reconstruction of the afflicted areas and revitalization of the nation;
6. seek an early resolution of the nuclear accidents and
7. pursue reconstruction with a spirit of solidarity and mutual understanding that permeates the entire nation.

While some of the seven principles are clearly aspirational, the focus on i) community led development within a framework of national government support, ii) technological innovation, and iii) resilient communities powered by clean energy, has significant operational implications. Under a section of the Report entitled “*Actors for Reconstruction Projects and Consensus-based Processes*”, the Design Council outlined its vision concerning how redevelopment priorities should be set. The main actors should be the municipalities themselves, as it is the residents who are closest to their communities who and understand local characteristics best. The Report went on to state that the national government should set the overall policy for reconstruction, including a vision, ideals, and types of assistance. Prefectural governments will take on the role of responding to wide-area administrative issues, as the government body that encompasses the various municipalities.

#### (iii) A calendar of key steps in the policy making process

1. **On 24 June 2011**, 102 days after the disaster, the Diet passed the Basic Act on Reconstruction in response to the Great East Japan Earthquake (the “Basic Act”), which authorized the issuance of “reconstruction bonds” to finance the reconstruction, the creation of Special Zones for Reconstruction and the establishment of an office, under the Prime Minister, known as the Reconstruction Headquarters to guide national government activities. The Basic

Act also charged the national government with the duty to prepare detailed guidelines, following the recommendations contained in the Design Council's Report and reconstituted the Design Council as an official organ of the Reconstruction Headquarters. Finally, the Basic Act requires that the Reconstruction Headquarters itself be reconstituted as an Agency of the government (to be known as the Reconstruction Agency) but did not set a deadline for its establishment or specifically delineate its authority vis a vis other government ministries in order to avoid the gridlock that often occurs due to bureaucratic turf battles.

2. **On 29 July 2011**, the Reconstruction Headquarters published a revised version of its Basic Guidelines for Reconstruction in response to the Great East Japan Earthquake (the "Basic Guidelines") (subsequently revised on 11 August 2011) which adopted most of the suggestions contained in the Design Council's Report. It set the timeframe for reconstruction at 10 years and designated the first five years as a "concentrated reconstruction period". The Guidelines call for a "full scale national response" by "revising the existing administrative systems, reducing the burden of procedures and providing assistance in the form of financial support, know-how and human resources".

The Guidelines envision the expenditure of 23 trillion yen (U.S.\$ 290 billion @ \$1:80yen) over the ten year period with 19 trillion yen (U.S.\$ 240 billion) to be expended over the first five years and these public expenditures do not include the money that will be needed in connection with damages caused by the nuclear accident. It is intended that the reconstruction expenditures will be paid for by the issuance of reconstruction bonds and by the reduction of government expenditures, the selling of state-owned properties, reviews of special government accounts and personnel costs of public servants, further increases in non-tax revenues and temporary taxation measures.

The Design Council introduced the concept of the "New Public Commons" as a method of inducing the private sector and civil society to play an active role in reconstruction. Basically this means that government, at all levels, should respond to the needs and demands of NPOs, NGOs and businesses by facilitating their involvement in the creation of projects both in social sectors and infrastructure. It is hoped that this will encourage new investment and stem the flight of existing businesses and people to other areas of Japan or abroad. As participation from all sectors (e.g., domestic and foreign, civil society and business interests, etc.) is encouraged, this process is called "Open Reconstruction". In accordance with the Guidelines, the private sector is expected to take advantage of the provisions of the new special economic zones and participate in infrastructure projects using the newly amended (April, 2011) law on public private partnerships, known as the PFI Law.

### **Special Reconstruction Zones**

Special economic zones were first introduced in Japan during the administration of Prime Minister Koizumi in 2003 as a way of reducing regulatory barriers to the creation of new enterprises. Significantly, these zones did not include any tax relief measures. In response to the disaster, a new system of Special Zones for Reconstruction (fukko tokku) will be established in the Tohoku region, which will include significant deregulation and tax relief for enterprises which establish operations there.

### **Backup Logistic Support**

There was a mayor in a small city inland of the coast lines (Sanriku) of Tohoku with 32,000 people. The mayor was elected in 2002 and with the study of the past history of the region, this mayor decided that his city can be a backup logistic support center for those coastal areas in case of major tsunami. In the last 100 years, Sanriku region was hit three times by major tsunamis according to the mayor. His city is 20 - 30 kilometers inland west from the coast and has road access to those areas. The region's major economic area is 20 – 30 kilometers west from his city. Thus, his city is located in the middle of the major economic region and the coastal area. He discussed his ideas with the citizens of his city and they agreed with the concept. He then called on the city leaders of the coastal area, prefecture government, self defense force of Tohoku, Fire/Police rescue and the citizens to drill for possible disaster from tsunami. He did it twice before 2011.

On March 12, a day after, he had over 5,000 rescue crews from the self defense force, police/fire rescue and other local governments, business and volunteer groups at his city. He dispatched his staff to those coastal areas in the night of March 11 and in the morning of March 12, he knew more than anyone about the conditions of those coastal areas. By the noon time of March 12, there were foods, water, blanket and other supplies delivered to those severe hit areas. Nobody asked but they were there.

His city hall was also damaged and could not be used. He asked a shopping center with an empty space and located parts of his city hall functions to the shopping center. Some citizens comment, "its more convenient to come to this shopping center to also visit the city hall". His city's sport ground became the base for self defense and police/fire rescue forces. His gymnasium became the lodging area for those and citizen volunteers. No residents complained.

Mayor Honda is not trained expert in emergency management or remote backup logistic support center operations. He thought what he could do and prepared his city for it. We asked Mayor Honda, "if he had a national government support or legal authority to organize the disaster recovery effort, how could it be different?" His reply, "I could have done much better for those coastal areas. He lost some colleague mayor and friends in the coast. He says he tried his best in saving those cities, which the mayor and his friends were lost in the disaster.

The disasters and tsunami can hit any coastal areas with earthquakes around the world. The example of Tono City with backup logistic support center operation can be practiced around the world for the reaction process.

**(iv) Some questions on the implementation of such measures****(a) Sectionalism within the public administration**

As stated earlier, in Japan, ministries with their jurisdictions stipulated in the establishment of laws and bureaucrats in their own right wield policy primacy, and ministers have less power in formulating policy. There is a tendency that the ministers transform themselves into representatives of their ministries' interests and positions, regardless of their opinions as Diet members prior to assuming their portfolios. The bureaucracy is very powerful and as noted above there are attempts (but few successes) in dissolving sectionalism, for example, through improving ministerial coordination under the direction of Prime Minister, regardless of each ministries jurisdiction. Overall the existence of sectionalism creates difficulties for Japanese governments to effectuate appropriate change in policies and systems and in responding to changing situations swiftly: ministries are the primary actors, and they often put too much emphasis on past records.<sup>4</sup>

**(b) Coordination between different levels of government**

Whether the national, prefectural and local governments will in generating a new policy framework for the reconstruction, be able to coordinate their efforts in a timely and efficient manner?

One of the members of the mission have raised a concern that there was a considerable lack of coordination between different levels of government. Decentralization policies have been putting incredible amount of responsibilities to local governments, but in a massive disaster case, norm of decentralization did not work in many occasions. The member interviewed several officials in the national government, and she was told that national government was reluctant to provide a mechanism for distribution of human resources to devastated municipalities.

Some officials in devastated cities have pointed out that prefectural governments were not quite effective in quick reactions because they needed a comprehensive grasp of the situation throughout the prefecture and react equally to all municipalities in the prefecture. Many complained that prefectural government asked municipalities to report their damages and tried to evaluate each cities' damages, and then to allocate goods or personnel. In the very early reactions,

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<sup>4</sup> *It also explains why ministers sometimes lack sufficient insight and knowledge in their policy domain and why they are replaced frequently in a process like periodic personnel transfers in a company. Given this reality, it is no wonder that in the past political parties have fought elections with no concrete platform.*

it will delay the actions if the organizations stick to the norm of being ‘equal and fair’. This is due to the experience and pre-emptive resource assessment and allocation.

### (c) Summary

In summary, with the creation of the Reconstruction Design Council a way to lead policy making has been defined. Dealing with a strong role played by the Japanese bureaucracy, is a challenge that can delay or even prevent policy implementation.

There are many bodies that would be theoretically included in coordination, but in the need for quick actions coordination has to give way to leadership. In the very early reaction phase, the mayor of Tono city took on a leadership role and proved his system was very effective in delivery of urgent aid to localities in need. But on medium / long term reconstruction, it is difficult to see how the coordination should take place. The Japan government launched the Reconstruction Agency, *Fukkocho*, in February 2012. The Agency was planned to operate about 10 years until the end of March 2021, mainly dealing with challenges of making reconstruction policy, settling down the location of special rebuild area, allotting reconstruction funds, and coordinating with other related departments to promote reconstruction. The government also implemented the Special Reconstruction Zones, however, it is still unknown how these systems can work effectively in order to attract private investment.

## 2. Building safer and more resilient infrastructure

Building safer and more resilient infrastructure is a key element in disaster risk reduction. A particularly important aspect of resilience is adaptation: the ability to cope with natural disasters. Disaster risk reduction is about much more than just emergency management — on the contrary, to be fully effective it must be integrated into all sectors of development and cover both measures to avoid disasters and measures to mitigate damage when they do occur. This is especially critical in this region which over many centuries is the most vulnerable to tsunamis.

*Scale of investment required to make the future more secure: if GDP losses are used to assess the disaster losses that have arisen from the tsunami of March 2011, the incentive of local and national governments to make such investments in the infrastructure will increase*

Global attention to disaster risk reduction has risen steadily in recent years. The Hyogo Framework for Action on disaster risk reduction is an especially important landmark in efforts to assist nations and communities in becoming more resilient to disasters and in better coping with hazards that threaten development. The Japanese Government is probably the world's leader in disaster risk



mitigation strategies and a model for other countries. The risk mitigation strategies were indeed highly effective notably in the case of roads and rail (see box).

### **(i) The international benchmarks in disaster risk reduction**

The following are some of the benchmarks that can be used to determine the region's disaster preparedness:

1. Risk management strategies;
2. Retrofitting and enhancing the most risk-prone infrastructure assets;
3. Social protection schemes (provides timely capital following disasters,
4. They help protect households from losses and quicken recovery);
5. Protection provided by conserving the local ecosystem;
6. Land use planning and building codes (materials, spacing etc.); and
7. Political responsibility for taking charge of disaster risk recovery

### **(ii) The key questions**

One of the key questions the government will ask in considering the measures needed to make its infrastructure more resilient is the likelihood of another tsunami of such a severity striking again? This is an important question because the answer will determine the cost which the Government will be faced to incur for the rebuilding of the shoreline defenses, which as seen above, were not quite effective to stop a tsunami of this ferocity.

#### **...with no precise answer...**

There are number of different replies to this question. Some argue that this type of tsunami is a 'one-off' occurrence that takes place once in several centuries and more than likely will not be repeated in our children or our children's children lifetimes. Others take the more gloomy view arguing that based on historical precedence, at least another three tsunamis of differing degrees can be expected within the next 100 years (and that the next could conceivably happen tomorrow on this scenario).<sup>5</sup>

#### **...and no clear policy solution.**

Both 'extreme' positions could be perfectly right and this is precisely the problem. Such uncertainty is impossible to plan for. Thus, the position the Japanese government have taken - that

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<sup>5</sup> The workers clearing up after the tsunami in Sendai built an observation platform so that they could get warning of another tsunami while they were busy cleaning up on the previous one.



is deciding to rebuild and raise the height of some of the old sea barriers, (but not to the height of the tsunami of March 2011) is probably the right one and will provide some assurance (not to mention employment in the local construction industry) but will not provide a complete solution to the risks that future tsunamis will produce.

### **(iii) Hardware for mitigation, education for better preparedness**

The fact that most people were killed by the tsunami is a major challenge for many people who plan reconstruction and mitigation. The Hanshin-Awaji Earthquake of 1995 killed over 5,000 people in the collapse and fire. In that case, the countermeasures were quite clear: stronger structure, fire-resistance and easier escape. The building standards were changed, many old and weak buildings were redeveloped or retro-fitted, and streets were widened.

However, in this case, it is not that simple. Most cities and towns in the region were considered as being tsunami-resistant. This area had been hit by tsunamis many times, 1933 and 1896 caused by earthquakes in the region and 1960 caused by an earthquake in Chile. Therefore, levees and breakwaters had been built in the last several decades. But most of these infrastructures failed to hold back the waves. And worse, many civil engineers had stated the damages caused by the tsunami were beyond their knowledge or even imagination, thus it is hard for them to decide how to resolve the issue.

Oral traditions sometimes save the lives of people far more than the most advanced technologies. There was a Guinness deepest breakwater in the gulf of Kamaishi. This breakwater was designed to reduce the tsunami height—largest tsunami height considered was 8.6 meters, which occurred in Meiji-Sanriku Earthquake in 1896—to the top height of on shore embankment (approximately 4 meters). One figure shows this breakwater succeeded to reduce the height of tsunami from 13.7 meters to 8.1 meters and delayed the wave for 6 minutes to reach the city, while a large portion of the city was inundated.

A famous saying in the region, “Tsunami *Tendenko*,” meaning ‘run separately and do not worry about the others,’ saved many lives, especially of youth. In Kamaishi City, while many schools are flooded by tsunami, more than 99% of elementary and junior high school students were saved—it is said that that 100% of the students under schools’ supervision were saved, and those who lost their lives were not under such supervision at the time of tragedy. This was because the City and Gunma University had been providing an education program to teach students how to react in large earthquakes and tsunami alert for the preceding three years. Their educational programme was based on the lessons from past earthquakes and tsunamis. These children were also taught to tell their parents not to come to schools to pick them up because the children would have already left the school, while coming to school would put the parents’ own lives in jeopardy.



**A middle school in Kamaishi: flooded to the third floor (top left), A levee destroyed by tsunami (top right), Otsuchi town totally devastated (below)**

On the other hand, there is an elementary school in Ishinomaki City, Miyagi that lost 74 children out of 108. This school was marked “safe” in the City’s tsunami Hazard Map, supposedly functioning as a refuge for local residents. However, on 11 March, this school’s two storey building was totally flooded. Principal of the school, who was away from the school on that day, admitted that the school had drilled once every year on how to escape from the school building to the outside playground in an event of earthquake or fire, but never drilled on how to escape from a tsunami. The school’s Crisis Management manual only stated “flee to higher ground”, when the tsunami was expected to occur, and never specified where to go. Only after 40 minutes did vice principal and 10 teachers decided to go to a higher ground near Shin-Kitakami Bridge, and soon after they started to evacuate, most students and teachers were swallowed by tsunami. In this case, failure of tsunami Hazard Map and lack of training led to this tragedy.

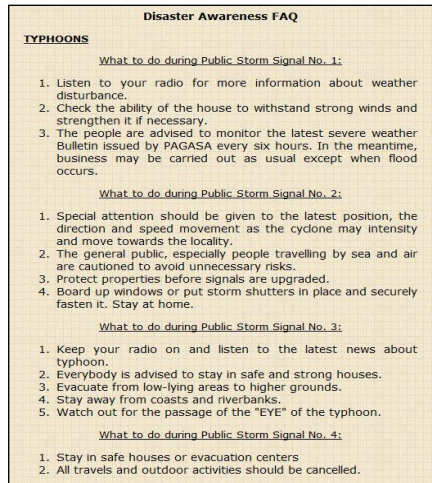
Another ‘hardware’ failure was the misinformation of tsunami alert. Immediately after the earthquake, the Japan Meteorological Agency(JMA) announced that the Magnitude of the earthquake was 7.9 and alerted tsunamis of six meters in height would strike the shore—it took several days for the Agency to correct the figure to Magnitude 9.0, and tsunami far exceeded 10 meters. According to the Mayor of Minami Sanriku Town, Mr. Jin Sato, this misinformation was due to the lack of capability of JMA’s observation and alert system. This system automatically predicted the tsunami height of 6 meters if the earthquake was Magnitude 8. The tsunami of 6 meters was equivalent to the tsunami caused by the Chilean Earthquake in 1960. Since a breakwater had been built after the 1960 tsunami, many people, including Mayor Sato himself, did not consider the tsunami as dangerous as it actually was. The town hall was totally destroyed and many lost their lives. Mayor Sato continues; “if the first alert announced Magnitude was 9.0, and predicted tsunami height would be 10 meters plus, many citizens might have escaped and

been saved”. In response to these fatal results, The government announced that they have changed warnings not to give false sense of security to audience, especially in the earliest alert.

**(iv) Need for action-leading principles**

Hardware (civil infrastructures, seismic alert system, hazard map etc.) has limitations. And worse, even if JMA announces the seismic intensity and tsunami alert, these alerts are not tied to action-leading principals. Many people do not know how to react to these alerts. Thus, it is important to teach people about the limitations, and teach and train based on these principals.

The images compare JMA’s description of seismic intensity and Philippines’ Metro Manila Development Authority’s(MMDA) description of Typhoon signals. As these two example show, while MMDA’s Website describes how to react to Typhoon signals, JMA’s Website only describes what kind of effect would occur in that seismic intensity or how tsunami



**JMA’s description on seismic intensity list only states the affect of seismic intensity (left), and MMDA’s “what to do” list during typhoon signals (right)**

warnings would be generated in the event of earthquake. Other organizations, mass transit operators for example, also only describe how they would stop trains when they observe seismic scale 5 upper and above, but do not describe how passengers should react while on/off the trains. There is an urgent need to develop behavior oriented alert system, and in detail evacuation drill for everyone.

The Government too is fully aware that spending more on risk mitigation is more cost effective in the long run. According to the World Bank, around 20 % of humanitarian aid is now spent responding to disasters, whereas a negligible (although rising) 0.7 % is spent on preventive measures taken to mitigate their possible consequences.

### **Need to take account of ideas from outside Japan which can offer some innovative solutions**

Applying new technologies and techniques; as the box shows countries are learning to manage threats much more effectively and innovatively even though meeting such a challenge as powerful as tsunamis is daunting and nothing really compares. But water management techniques, (e.g. building levees a few miles away from the shoreline) can halt the progress of the wave, while cities themselves can be designed to 'trap' water and thereby mitigate the worst effects.

#### **Rotterdam's construction of 'floating buildings'**

*The Netherlands is at the forefront of water management issues. Rather than relying on dykes to water out, Rotterdam, its and Europe's main port is also trying to mitigate the consequences if water comes in. A 10,000 - cubic -meter tank was built into a new car park, big enough to catch roughly 25 per cent of the water from a once-in-a- century flood. A public plaza has been designed to turn into wading pools when it fills with rain water.*

*In the city's harbour sits a floating pavilion shaped like three halved footballs built on huge blocks of foam. It is a model for the floating communities the city hopes might one day repopulate the docklands, whose traditional shipping activities are moving elsewhere. Pieter Pigdor, one of the pavilion's architects, says floating buildings can be up to seven storeys tall, are inherently flood proof and can be easily moved.*

*The Economist*

It is also important to make the nuclear infrastructure safer. The aftermath of the Fukushima nuclear disaster must be dealt with properly so that citizens and private investors feel that the region is safe. Finally, assurances need to be given that the region will have an adequate supply of electric power (see the section below).

In summary, a full evaluation of the benchmarks of risk mitigation strategies is not possible in this report but the following observations can be made:

1. more attention to software of disaster risk mitigation (training of all groups etc.) needs to be made;
2. such training needs to undergo a serious evaluation; and



3. undertaking of a study to explore other countries risk mitigation strategies in infrastructure and their lessons for Japan.<sup>6</sup>

### 3. Sustainable development (renewable and smart cities) and green growth

Green growth aims to foster economic growth and development while ensuring that natural assets and environmental services are protected and maintained. The approach places a premium on technology and innovation—from smart grid systems and high efficiency lighting systems to renewable energies including solar and geothermal power—as well as on improving incentives for technology development and innovation.

Through an emphasis on technology and innovation, various forms of cooperation and the social environment and institutional framework for low-carbon and sustainable society, green growth provides multiple options for countries and the global community to realize the vision. It can shape strategies for a response to climate change by reducing carbon emission through the development, improvement and deployment of various renewable energy sources and efficient energy use. At the same time, it can stimulate economic growth and equip an economy with better tools to cope with rapid demographic changes as seen in the Tokohu region, by fostering green businesses and accompanying synergy effects, and generating green jobs. It can also help a society to tackle resource scarcity and improve the environment and natural assets, including ecosystems and biodiversity, through improved and enhanced natural asset and resource management.

Green growth strategies are also able to produce a more resilient growth model, more capable of withstanding external shocks—whether related to climate, energy, food, resources or sudden demographic change. Green growth could also facilitate greater involvement of all relevant stakeholders as its successful implementation requires such participation and cooperation. When it is tailored adequately for each country, locality or region according to its needs and situation, and complemented with social protection to ensure more inclusivity and stability. Finally the green economy is a very strong business opportunity and represents the world's fastest growing sector. This growth is contingent, however, on government policy and its commitment to introducing robust measures and targets on *inter alia* climate change etc.

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<sup>6</sup> The Economist January 14 2012 ‘briefing Natural Disasters’ P 60. The case is mentioned of Pass Christian, a resort town in Mississippi, where an apartment complex was destroyed by Hurricane Camille in 1969, killing 21 people who had taken refuge inside. A shopping centre and condominiums were later built in the same area, only to be wiped out by Hurricane Katrina in 2005, since when more new condominiums have gone up nearby.

The concept of green growth and the accompanying technologies such as smart grid systems, energy saving techniques as well as renewable energy systems are promising examples and strong opportunities for PPPs (see box below) and we take each in turn:

**(i) Putting PPP into practice for the green economy**

**(a) Smart grids and smart cities:**

Climate change poses serious risks for the global environment but presents new opportunities as well. There are significant benefits that will accrue to the economy as the energy paradigm shifts from a system based on a low cost of carbon and ever increasing demand for electric power to one of high carbon costs and the need to more efficiently manage energy consumption. The concept of the smart grid, which will combine information technology with tools to manage variable renewable power, demand response and distributed power generation, seems ideally suited to address these issues.

**Key smart grid functionalities include:**

- “Wide-Area Situational Awareness” refers to technologies that will give bulk-power system operators access to real-time data that will allow them to properly manage congestion and reliability across the entire system in order to alleviate massive blackouts such as the one that occurred in the Northeastern United States in 2003.
- “Demand Response” will allow system operators to interact with power users to vary the supply during periods of high demand or unavailability due to variable resources.
- “Electric Storage” through new technologies such as reciprocating engines, fuel cells, micro turbines, and photovoltaic’s can form a new web of distributed energy resources (DER) which will supplement the generation of power by the utilities
- “Electric Transportation”, or the advent of widespread use of electric vehicles, will place new demands on the power system as millions of cars will need to be charged over large areas in order to allow seamless transportation networks.

**Experiences of this PPP in the Tokohu region:**

The evidence of such projects is still very limited however a new resilience for rebuilding cities will be required involving new city and community design. In some cases, residential areas will need to be rebuilt farther from the sea. This will not happen overnight as these communities can only be planned once the national government has cleared the debris and settled on plans for reconstruction of the major transportation links. A number of localities are however considering the development of “eco towns” which will rely on renewable energy sources and be connected by the smart grid.

At least one major 'smart' city planning project, Tago nishi ecology model town in Sendai City is moving forward in the region to the detailed planning stage, which involves not only PPP but government-academic-private sector partnership. The 'smart city' will include residential, commercial, and public housing areas, the last being the part where tsunami survivors can be permanently relocated. The plan is worked out by the three parties (plus community consensus-building). Companies can even help with the consensus building part (i.e. allow participants to change variables and see what happens—e.g. if you move or resize residential areas, re-arrange disaster prevention hardware, utilities, etc). Those involved have advocated for solar power generation with a local consumption model, with the plans for solar farms on the outskirts as well as panels on the roof, energy storage cells so that things would work when the national grid turns off during disasters.

This sort of PPP might be found within, for example, a newly created private sector city administration committee, which will be run by those who built or provided the services (including software companies who build the home networking system, companies who were involved in planning and hardware systems, etc.) who will liaise with the local government as well as the residential association to keep the city running.

#### **Challenges of applying PPPs in this area:**

**Integrating the project into the city administration:** As it concerns the smart city project the challenges are: how to graft the area onto existing and neighbouring residential areas (solution: the city will provide some emergency service options for neighboring communities), making it economically feasible (it might have to include convincing the public that safety is something worth paying a bit more for), making it run like it should in the long term (the admin committee is an attempt at this one), and how to propagate the model beyond the immediately disaster-struck areas, if and when it proves successful.

**Policy risk:** Due to rising demand for electric power throughout the world, it is clear that significant bottlenecks will develop if policy makers fail to take action in the near future. For example, many observers believe that large-scale wind and solar plants must be developed outside highly populated urban areas but the electricity will not reach customers unless expensive transmission lines are built. Private investors are unwilling to finance the construction of new, two-way transmission lines, unless there is a degree of certainty about the economic viability of renewable power projects. In the absence of a “carbon price” or mandatory interconnection regulations, the economic viability of such projects is still uncertain.

**New methods for determining returns and rates:** Since the smart grid involves the marriage of information technology and power<sup>7</sup> generation and consumption, regulators in the telecom sector and power sector must carefully coordinate their policy initiatives with tax and consumer concerns to make sure that they do not work at cross purposes. High-speed data and voice infrastructure is a fundamental driver of growth in many economies but their development should be considered alongside power initiatives in order to achieve economies of scale and avoid redundancies. “Dynamic pricing” using smart grid technologies will also allow customers to pay for electricity based on the cost to produce it at different times in the day or by variable sources.

**Allocation of risks:** Stakeholders in the new smart grid environment include customers, the utilities and their shareholders, contractors, suppliers, product and appliance manufacturers and the regulators. The costs and benefits that can accrue to each must be carefully considered in the design of the new regulatory framework to ensure that the risks are allocated to those who are best able to manage those risks. For example, new technologies, which supplant old methods, can cause significant hardships to incumbents who will have little or no incentive to make necessary changes if they cannot adequately recover the costs associated with legacy systems. In order to encourage transition to the new smart technologies, the regulators, particularly in deregulated markets, may need to find ways to mitigate those risks for utilities. For example, in order to ensure the security and reliability of the smart grid, interoperability standards between various parts of the system are necessary.

**(b) Public lighting and traffic management lighting networks in non-renewable energy in the road sector (traffic management and public lighting networks)**

Here a private PPP operator optimizes the energy consumption of public lighting and traffic management systems through a PPP management contract. Thanks to new technology and a more efficient operating approach it is possible to save 45% of electricity in public lighting, and 85% in traffic management systems. These important savings help to refinance (sometimes 100 per cent) the modernization within a PPP approach, i.e. 1) Immediately have a much better carbon footprint, 2) Achieve overall savings in the medium term, relieving public sector budgets. These projects are being done in cities all over Europe.

**Experience in Tokohu region:**

Not widely experienced or known in the area. Some solarpower generater and small batteries are used for lighting up street signs and warning lamps for road constructions, however, many

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<sup>7</sup> (see for example the Annual Report 2011 of the Association of French motorway concessionaires, ASFA).



municipalities and public bodies are more aware of wider application of these technologies—even in Tokyo metropolitan area, lots of confusion had occurred because of the “scheduled blackouts”.

**Challenges:**

The main challenge to this PPP based on experiences in Europe comes from the existing public utilities and local service providers.

**(c) Electric charger terminals/ stations by an alliance of electricity network providers and PPP operators of parking’s and dedicated charging points.**

The stations can leverage the existing electrical grid and home charging is also an option. Nevertheless, longer drives between cities and towns require a network of public charging stations or another method to extend the range of electric vehicles beyond the normal daily commute. One challenge in such infrastructure is the level of demand; an isolated station along with a busy highway may see hundreds of customers per hour if every passing electric vehicle has to stop there to complete the trip. In the first half of the 20th century, internal combustion vehicles faced a similar infrastructure problem.

**Challenges:**

While battery storage technology is improving by the day, electric vehicles will not be manufactured or sold on a massive scale until the smart grid can deliver a multitude of stations where these vehicles can be charged.

**(d) Green PPP motorways (= green design, construction and operation)**

The concept of Green Economy is key to the development and maintenance of modern PPP motorways. Generally speaking, projects and networks should not only be financially sustainable and viable, but also environmentally. For this purpose, any measure necessary for mitigating negative external effects, which the infrastructure is likely to cause, shall be included into the scope statement of the PPP concessionaire.

Although the share of necessary environmental funds may vary considerably, depending on the characteristics of the individual project, a good example appears to be set by French motorway operators that allocate 10% of their overall annual investment to sustainability (see for example the Annual Report 2011 of the Association of French motorway concessionaires, ASFA).

In a way the concept of Green Economy encompasses green Public Procurement (GPP), which the UN ECE fully supports and that is also promoted by the European Commission (see the Communication (COM (2008) 400).

**This means:**

- Conducting an environmental impact assessment, from the outset, as being part of new project design and devising all necessary measures accordingly and cost-efficiently. In certain cases the disturbance or even destruction of a biotope may necessitate changes in the location and scope of a motorway.
- Building the project with environmentally friendly construction technology (reducing emissions, optimizing the use of energy and materials), as well as recycling road construction materials later on during the rehabilitation phase.
- Taking all necessary environmental protection measures, i.e. protecting the natural habitat from the network by fences; implementing wildlife crossings and protecting water resources; not to forget the reduction of noise emissions by barriers and noise absorbing pavements. In certain cases, green facilities maintenance in the vicinity of the project, as well as the promotion of environmental protection projects may be needed.
- Optimizing traffic management and guidance in such a way that motorists reduce emissions by optimizing their speed (introducing speed limits as well as fluidifying traffic and avoiding congestion).
- Using, as much as possible, whilst being reasonably cost-efficient, renewable energy production (thermo-solar, photovoltaic and wind panels that provide electricity to all motorway equipments).

**Challenges:**

The biggest challenge for this PPP is the highway policies and politics. Japan's public highway operators were privatized in 2005, and its very complicated scheme is a headache for PPP application. In addition, it seems that highway tariff has been highly political issues in recent administrations, and often used as a tool to attract votes in the election. Thus the highways have been 'excluded' from infrastructures for concession contracts.

**(e) Renewable energy and biomass through PPP**

One option in exploring other options to nuclear power is the use of biomass, which can be taken from the vast but unexploited forests of Japan. Toyo University and PPP Graduate School are promoting one biomass industry to be developed in Japan in long term and in Tohoku (northern Japan) in short term. *First*, Tohoku is reported having over 20 year volume of debris. The debris can be processed and burned to convert them to electricity. *Second*, Tohoku develops biomass,

namely wood pellet industry using vast area of Tohoku, which are covered by forest. 67% of the land areas of Japan are covered by forest, more so in Tohoku. *Third*, after the debris are taken care of, wood pellet produced in Tohoku can be used to generate electricity for Tohoku. *Fourth*, after the start in Tohoku, Japan can develop other forested areas with wood pellet industry to create jobs, convert to renewable energy and make Japan a resource nation rather than depending on foreign oil, coal and gas.

Other natural energy sources, such as solar and wind are fine natural resources but they do not produce employment, which Tohoku needs. Renewable abundant forest woods can create lasting employment in Tohoku.

In addition, the issues related to biomass are worth considering. For instance, the Tohoku area has many years of debris from tsunami, which can be converted to energy. A big problem is that the majority of debris contains salt, and if burned, it produces dioxin and CO<sub>2</sub>. If there is a technology, which can convert the debris with salt to energy without dioxin and CO<sub>2</sub>, it will be a winner. The possible solution can be a plasma technology. Some of the debris (especially grasses and some soils) contains radiation. If treated, it will thicken the radiation. Plasma cannot solve this. Presently, the debris are burned and not converted to energy.

### **Experience:**

The government is trying to build 5 power stations in Tohoku, which can convert debris to energy. The debris is only temporary solution. It will be consumed in few years. The area needs more sources to be converted to energy after debris. Most of Tohoku is covered by forest. 67% of Japan is covered by forest. Forests are not being used for woods or for energy. Europe and the North America have found biomass from trees and converting to energy close to 100 million tons (pellet) a year. Japan produces 60,000 ton per year for boilers and pellet stove. Biomass requires cutting trees, transfer to the factory, replant trees, factory needs workers, the products must be shipped to power plant, etc. All these produce jobs for Tohoku. With high RPS standard in Europe, Tohoku can produce their own electricity and export the products to Europe as well. Japan can follow this move and can produce biomass wood pellet to be converted to energy rather than depending on fossil power generations.

### **Challenge:**

There are several very small pellet or biomass plants in Tohoku. But it is often said that most of them are producing little amount and costly and not feasible. One operator of a biomass plant told the UN mission that they are eager to withdraw from the biomass plant, once governmental

subsidiary expires. The key challenge is the need to have appropriate incentives from policy makers to use renewable.

In summary as the region searches to reinvent itself, it needs to consider new projects and new economic activities: The green economy is an exciting basis to plan the future. Already the future green industry it is predicted will be worth billions in the next ten years provided government keep to commitments to use renewable energy and phase out other sources of energy. The above listed projects are some of the PPP options that the region may consider.

**(f) The key question is whether Energy policy and the need to move to renewable**

**The future of nuclear power is a matter of intense debate...**

As of this writing, the future of nuclear power is the subject of fierce debate. Nuclear energy prior to the 3.11 disaster, the DPJ controlled national government had decided to greatly increase Japan's reliance on nuclear power to approximately 50% but the Fukushima disaster caused serious reconsideration of this policy. Currently Japan has 54 nuclear reactors. Four of the reactors at Fukushima were damaged due to the disaster. 39 have been shut down for regular maintenance and the remaining 11 are expected to be shut down for maintenance by the summer of 2012.

**...with little consensus on the issue apparent.**

Public opinion is quite divided on the issue of nuclear power. Will Japan go the way of Germany and completely eliminate its reliance on nuclear power or will it find a way to continue but at a reduced rate of dependence? Local opposition to restarting the nuclear plants seems to be growing. Local approvals are necessary in order to restart the nuclear reactors that have been shut down. The government is currently listening to various opinions in connection with its efforts to determine the best mix of power sources. It is expected that its new basic policy will be formulated sometime in the summer of 2012.

What is absolutely clear at this stage is that compared to the period before the Fukushima accident, reliance on nuclear power will decrease and renewable will increase.

**Moving to the use of Renewable energy...**

The Renewable Energy Law enacted on August 26, 2011, effective July 1, 2012, was a boost for renewables. The law provides that power companies cannot refuse to enter into a power purchase

agreement with a supplier of renewable energy, except under certain limited circumstances. Renewable energy includes solar, wind, small and medium scale hydro, geothermal and biomass. It is interesting to note that energy from tidal waves is not explicitly covered.

### **...few exemptions permitted**

Power companies will be exempted from the obligation to purchase renewable power if it is likely that there will be an adverse affect on the profitability of the power company or for other reasons determined to be reasonable by order of the Ministry of Economy, Trade and Industry (METI). As METI policy on this matter has not yet been determined, this is an important area to watch.

The law provides for a new feed-in-tariff system (FIT) to be implemented to expand the prior tariff which was previously limited to solar. The FIT will be applicable to any size facility, from residential roof tops to utility-scale projects.

The law requires METI, once per year, after considering the opinions of a third party commission, to decide the amount of the tariff. While there are no upper or lower limits on the amount of the tariff, METI is required to consider the cost of providing renewable energy, the amount that can be supplied and profitability of the supplier.

METI will also determine the period in which the FIT will remain in effect. While there is no minimum period, the law requires METI to make its decision taking into account the useful life of major components of the renewable power facilities.

All users of electricity (both industrial and consumers) will be charged a uniform surcharge for renewable power; however, larger industrial users may receive somewhat reduced rates.

## **4. Forging regional economic competitiveness**

Providing leadership and a coordinated policy, emphasizing safety and risk reduction and implementing environmental sustainability strategies makes communities more attractive to investment and new jobs. It signals to local citizens and outside investors that disaster-prone regions are thoughtfully and proactively managing their risks. Many business managers and chamber leaders are highlighting their active risk-management policies as a selling point for potential investors and customers. On top of this the region should create the conditions for helping business to get back on its feet and to increase its competitiveness.

Improving competitiveness is primarily task for business to do. In a market economy, the primary responsibility for improving competitiveness must lie with firms: this is recognized by business itself. The vast majority of businesses prosper without public subsidy. National governments provide the overall stable macroeconomic frameworks, open markets, deregulation and legal frameworks that allow their business to compete successfully. However, the local governments

too have an important role to play. National policies need to be complemented by local efforts to insure that they are effective and to help local industries of every area of Japan to become internationally competitive.

**(i) Benchmarks in regional economic competitiveness and PPP**

The following benchmarks are the examples by which the performance of local regions can be evaluated:

1. examples of diversification and economic growth (the tsunami affected regions should undertake a transformation of its local economy through process of deep structural change);
2. realistic and continual assessment of its strengths and weaknesses;
3. local economic performance needs to be benchmarked against performance in other regions of Japan and should not be treated in isolation;
4. new schemes created to draw local authorities into partnerships with private sector;
5. local delivery of government services to business (in addition to its role in facilitating local responses to the tsunami, the government is responsible for delivering a range of services to business at a local level).

**(ii) How the region is performing with respect to the benchmarks?**

The reconstruction Headquarters have published Guidelines for Reconstruction in response to the Great East Japan Earthquake (revised on 11 August 2011), which included most suggestions contained in the Design Council's Report. The Basic Guidelines envision the expenditure of 23 trillion yen (U.S. \$ 287 billion @ \$1:80) over the ten year period with 19 trillion yen to be expended over the first five years and these public expenditures do not include the money that will be needed in connection with damages caused by the nuclear accident. These expenditures are expected to be paid for by the issuance of reconstruction bonds and by the reduction of government expenditures (ex. reduction of personnel costs of public servants), selling of state-owned properties, reviews of special government accounts, imposing reconstruction-tax, and further increases in non-tax revenues.

As stated earlier, the Design Council introduced the concept of the "New Public Commons" as a method of inducing the private sector and civil society to play an active role in reconstruction. This means all levels of government should respond to the needs and demands of NPOs, NGOs and businesses by facilitating their involvement in the creation of projects both in social sectors and infrastructure. This is expected to encourage new investment from other areas of Japan or abroad and retain and strengthen the existing business and people. In the "Open Reconstruction" process, participation from all sectors including domestic, foreign, civil society and business interests is encouraged. In accordance with the Guidelines, the private sector is expected to take advantage of the provisions of the new special economic zones and participate in infrastructure projects using the newly amended (April, 2011) law on public private partnerships, known as the PFI Law.

It is also important that PPP schemes to allow private sector investors to receive a market-based return on their investments in the stricken areas, rather than be limited to “policy-based” returns. One of the members in the UN mission had meeting with senior members of Keidanren (Japan Business Federation), and they told that many private entities in Japan had been very skeptical about economic feasibility, viability, and financial profitability of the projects in the area. In addition, general public often has negative sentiments toward private sectors which make profits in providing public services.

## 5. PPP trends and building local and national PPP capabilities

### PPP in the Japanese recovery

*A well-planned program of PFI investment for rebuilding the nation’s infrastructure can also go a long way towards making Japan a more attractive place to put money into long-term sustainable investments. The assets that are created through PFI, once they are up and running, generate reliable, annuity-like cash flows from tolls or from availability payments linked to tax revenue. These cash flows are ideally suited to life insurers and pension funds. Moreover, these liability-driven investors, both domestic and international, will be attracted to the low risk, high-yielding securities that provide long-term project financing and to the diversity the investments bring to their portfolio holdings.*

*There is an estimated \$300 billion of investment to be made in fixing Japan’s infrastructure, though that number is sure to rise further. The Japanese government and domestic insurers should make PFI a central feature of their long-term planning for the restoration of the physical and social infrastructure of the affected regions. With the help of private investment, the country stands a fighting chance of turning this great tragedy into a rallying point for their people that investors around the world will want to support.*

Harry Teitelbaum.....

### (i) PPPs are transforming countries around the world...

PFI and PPP is being embraced by central and local governments in many developed countries as a model for leveraging private sector financing for brownfield re-development of public infrastructure.

### ...financed by user fees or availability payment from taxation...

In return for lease payments that are financed by tolls or tax revenue, private companies and their financial backers get to operate and maintain the assets they design and build for very long terms, typically 25 to 30 years.



**...with increased certainty of outcomes in contrast to typical public procurement**

This arrangement produces not only better incentives to produce creative solutions and higher quality assets delivered on-time and on-budget, but creates quality jobs that lift the economy.

**PPPs make good sense in disaster recovery...**

In a country where vital infrastructure projects will need to be undertaken immediately and for many years to come, PPP/PFI represents a tool for intelligent long-term planning that seems especially appropriate now.

**... and can achieve important policy goals in reconstruction....**

PPP can be the means by which these goals of rebuilding a safer infrastructure, creating a sustainable future and economic competitiveness, can be realized.

**...at the same time avoiding the need for Japan to spend huge resources on non economically viable projects.**

As we see the nature of Japanese political can mean projects starting in regions that are done for political as opposed to economically justifiable reasons which in many cases doing infrastructure projects where there is no community to serve. PPPs avoid these politically motivated projects because before they are begun a careful assessment takes place involving economic feasibility studies and outline business cases so as to ensure economic sense.

PPPs can make the private sector responsible for successfully addressing the wide range of infrastructure vulnerability factors.

These factors are the risks in projects that need to be reduced if the natural disaster is not to claim more lives. They include making sure the projects use the appropriate construction materials, adopt the correct design of buildings, comply with existing building codes and above all are regularly and properly maintained.

**...and this is important especially now for Japan is in a very difficult financial situation.**

Sharply increase the worst effects of the disaster such as Japan's government debt, at over 225% of GDP at the end of 2010, was already the world's highest before the earthquake, tsunami and

nuclear disaster hit one month ago. While that debt is 90% owned domestically and financed by Japan's high savings rate, it will constrain what the government is able to spend on reconstruction.

But PPPs have however complex structures and incur extra costs. Such costs relate to feasibility studies, advisers and legal fees, meaning that mainly only large companies can afford to bid for such concessions and the government lacks capacity in such deal making. It also lacks the senior management expertise to scrutinize the project after it become operational.

**...but despite this the government of Japan is seriously considering the PPP option...**

It is recognizing that given the circumstances, an unprecedented level of sustained long-term private sector financial support will be needed. Also it is starting to prepare tenders for feasibility studies for PPP in the water and sewerage sector which was badly damaged by the tsunami.<sup>8</sup>

**...and fortunately, much of the groundwork for this new engagement has already been laid...**

Japan was a relative early mover in terms of adopting a framework for engaging the private sector money and expertise for the delivery and long-term management of public assets through the Private Finance Initiative model. Inspired by the success of PFI projects undertaken in the early 1990s in the UK and concerned about tax revenue shortfalls at home, Japan enacted its first PFI law in July 1999, revised it in 2001 and again in 2005.

**...with a track record in PPP already achieved.**

Use of the procurement model, which is generally reserved for projects with a value of at least \$32 million, has grown dramatically since then, though it remains a relatively modest percentage of Japan's infrastructure spending. Even so, as of June 2009, PFI had been used to deliver more than 400 infrastructure projects, ranging from sea ports, airports, schools and hospitals around the country, with more than 200 of these already operational.

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<sup>8</sup> Orix wins contract, November 2011

**However PPP is still rather new in Tohoku region, the number of municipalities with experiences of PPP/PFI is limited:**

**... does the country have the local capacity to deliver PPPs for regional reconstruction?**

Will local official be able to overcome capacity and institutional constraints that may prevent them from designing or accepting PPP projects in a timely fashion? Japan however has neither an effective PPP training programme nor strong national PPP Unit to build local capabilities in PPPs.

**(ii) Some actions have to be taken for wider application of PPP/PFI**

**(a) Establish a mechanism for technical assistance**

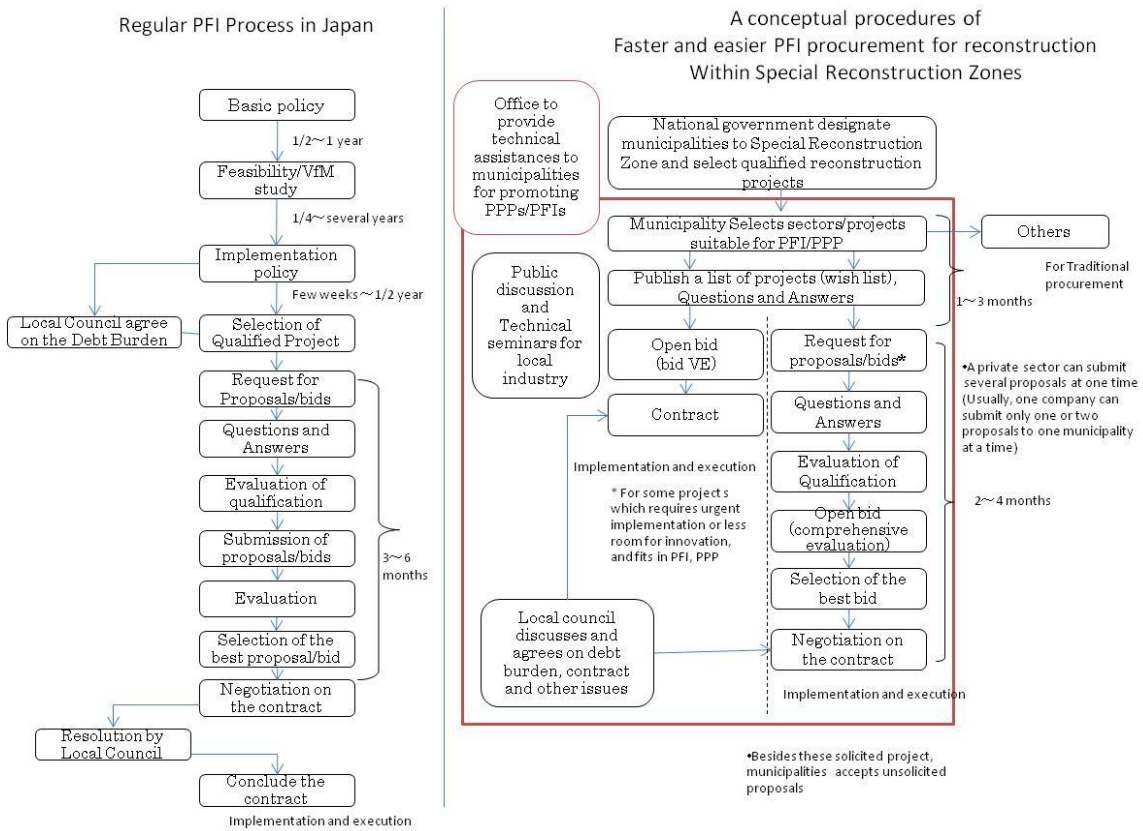
Almost no municipalities in the devastated area have an experience of implementing a PFI project. For these municipalities, learning PFI procurement from scratch is a time consuming and tiresome process. Furthermore, many municipalities are struggling with the loss of workforce in the earthquake or the tsunami, in addition to the administrative reform to reduce the number of personnel. Therefore, it is crucial to establish a mechanism to provide technical assistance to the inexperienced municipalities. Examples of this organization can be found in many forms, Infrastructure UK in United Kingdom (consists of both public and private employees), IGD in France (consists of mainly public employees), Treasury Department's Advisory Committee in Australia (public officials and hired private advisors), and PPP Units across many countries.

For example, it should be helpful if Reconstruction Agency or Tohoku Regional Development Bureau of Ministry of Land, Infrastructure, Transport, and Tourism to establish a PPP Technical Assistance Office. This office is designed to provide early consultation, coordination among municipal/regional(prefectural)/national governments, assists pre-implementation studies (e.g. VfM testing, Feasibility studies, Environmental Impact Assessment etc), assist financial structuring, as well as sending experienced personnel directly to the municipalities. The office can also initiate several pilot projects, receive and evaluate unsolicited proposals and build a database of PPP projects in Tohoku Region. Those activities can ease the burden on these small municipalities while it can gain collective knowledge of PPP/PFI that is applicable to other municipalities in the area. This office can also provide assistance, lectures/seminars to local industry and general public, which also lack experience and understanding of PPP/PFI. These activities can help local economies to participate in the PPP/PFI projects, and consensus building among general public.

This mechanism should be introduced together with following issues.

**(b) Shorten/omit some bureaucratic procedures in a PFI procurement for reconstruction**

In Japan, it usually takes a couple of years before implementing a PFI project. A PFI procurement is different from traditional procurement, and requires a lot of studies before deciding to implement a project. These procedures can be affected and delayed by the budgeting timeline and schedules of the local council. Thus, for some specific reconstruction projects, it is recommended to consider the ways to shorten the process of PFI procurements. For some types of projects which have less market risks and more predictability of cost and benefit (e.g. municipal administrative buildings, public housing, etc), it might be possible to omit some of the initial procedures—i.e. VfM testing and feasibility study, initial policy and implementation policy. By omitting these processes, it would be possible to shorten the implementation process by half or even less. It will also ease the workload of officials in the devastated municipalities.



Flexible and wider application of Concession (amending of the PFI Law to implement concession is in progress)

The Japanese PFI Law was amended in June 2011, and introduced concession contracts in its PFI scheme. However, in this amendment, concession contracts are only designed to apply to user-fee based projects, but excluded national highways. In order to widen private sector’s business opportunities, the national government should consider re-amendment of the PFI Law. This

amendment is to make concession contract applicable to non-user fee based projects and highways and related facilities.

**(c) Special Reconstruction Zones and private participation**

Japanese government designated 222 municipalities eligible for the Special Reconstruction Zone. The government also announced to set up a “Unit for Collaboration with Private Sector for Reconstruction”. These will help attract industries in the region, with tax breaks and other financial incentives. By the same token however, the national government should consider the financial discipline within the region, because global private sectors are now more aware of the continuity and sustainability of the local community where they locate their businesses. Even though the Special Reconstruction Zone includes “private sector’s proposals” within its scheme, it is still unclear how to utilize the ideas the advantages of private sectors in an open and competitive manner.

**(d) Improvement of procurement system**

There have been many interesting and “innovative” ideas for reconstruction. Even the Reconstruction Design Council proposed many different ideas and concepts. In a total devastation, it is hard for municipal government to select and specify adequate level of public services, including reconstruction projects. Use of unsolicited proposals and negotiation procedures should promote more innovative ideas.

There has been a discussion to introduce “competitive dialogue” in Japanese PFI procurements. Some municipalities have introduced negotiation process, but most of them were intended only for clarification purposes before calling for bids/proposals, and not for selection of the best bid/proposal. The Cabinet Office just presented the concepts of use of competitive dialogue in Japanese procurement, but the dialogue procedure has not been clearly stated within the country’s procurement related laws. It is also uncertain whether the national or municipal governments have capability of transparent and competitive negotiation and evaluate the best proposal according to it. Because the dialogue procedures were not stated in Public Accounting Law and other laws, it becomes complicated for private sectors to learn each municipalities procedures, which is a huge distraction for private companies.

In addition, the national government should help encourage public sectors to submit unsolicited proposals. Often, many countries have included some incentive systems and other ways to compensate private sectors who submit the original proposal. Incentives comes in many forms. For example, Korean Republic gives “bonus points” for the original proposer during their selection of the best proposals, countries like India, Taiwan, and Philippines give the original

proposer a right for “Swiss Challenge,” in which the original proposer acquire a “right-to-match” to a better counter proposal. Some other countries give original proposers a chance for “best and final offer.” The national government should also provide assistance for municipalities in evaluating, budgeting, prioritizing, assessing risks and impacts and other related issues.

## Chapter III. Key Recommendations

But to move forward to PPPs will require considerable governmental creativity , new thinking and better capacity, coordination between local and a national 'will' to build back 'bigger and better'. This chapter presents the delegation's key recommendations for use of PPP in reconstruction:

I.	Better National coordination
II.	Greater use of outsourcing
III.	Better financing (e.g. infrastructure funds)
IV.	Improved resilience of hardware and software in disaster recovery and risk mitigation
V.	Wish list of projects (most local authorities said they wanted jobs and new factories but to do what)
VI.	Local governance and monitoring of contracts

### I. Better national coordination

1. National budgetary allocation tend to result in too many small infrastructure such as airports in each local jurisdiction by pork barrel
2. Solution to make the public infrastructure more efficient is not only to change ownership of operation from public to private, but also to design the solution as integrated infrastructure network.

### ■ Consideration of National Emergency Management Organization

Toyo University and PPP Graduate School is examining the establishment of a national emergency management organization for Japan. University of Tokyo team of seismologists announced that the Magnitude7.0. earthquake hitting Tokyo area in 4 years has 70% chance of occurring. Other areas (Tokai – Shizuoka to Nagoya and Nankai – Kinki – Wakayama – Osaka – Shikoku) in Japan on the Pacific side have higher percentage. Japan with frequent earthquake and tsunami must have better central control of emergency management.



There is National Disaster Management Office within the Cabinet Office, which is manned by less than 60 employees on loan from other ministries of Land Transport Infrastructure and Internal affairs, etc. Like other countries, EM is a mainly a responsibility of local governments according to Japan's law and with small disasters, it works well.. This time, however many local governments lost their functions. There are self defense force (national), Police (prefectures) and Fire and Rescue (national & local), which can work when such disaster hit the country. There is however, a very limited coordination among those involved in EM in Japan nationwide.

The following are the recommendation for Japan to consider according to Toyo study. The study makes this recommendation from the study of US FEMA – Federal Emergency Management Agency operation and from a PPP conceptual thinking.

Toyo PPP Concept of Japan Emergency Management Agency - JEMA:

Major Characters of JEMA as follow:

1. There should be one unified command system for national, prefecture and local governments (cities, towns and villages) in case of a major disaster determined by the prime minister;
2. Establishment of Comprehensive National EM Plan by JEMA and other governments involved (national and local) and others will have their own plans;
3. Director of the agency should not be a politician but an expert in EM supported by major political parties;
4. The EM and command system must have no sectionalism/vertical but horizontal command throughout the national (government, Self Defense Force, fire and police), prefectural and local governments;
5. Clear responsibility on all levels defined;
6. Prepare appropriate budget for the operation and recovery fund;
7. Establish EM Training Center (EMTC) under the agency in coordination with Self Defense Force, Fire, Police Operations and train the emergency managers at all levels;
8. The agency can be created without hiring new employees. They can be sent from other national offices such as MOLTI local offices (approx. 9000 officials nationwide), which are involved in emergency management and other disaster

related offices. There could be 9 JEMA offices throughout the country. Head office should be located in Tokyo area and sub-head office should be located in Kansai area; and

9. Each local government appoints 2 – 5 emergency managers (depending on populations) and trained at EMTC. Within 1 year, there could be minimum of 3600 and possible 5000 (1800 local governments in Japan) local government EM specialists, who can share the responsibilities under the JEMA command.

The study group of Toyo PPP School believes that establishment of such divisions within the public organizations will enable them to formulate effective plans based on their high-level future visions, policies and schemes, identify external capabilities required for executing plans in consideration of the conditions unique to the individual public organizations, ensure the consistency of procurement activities comprehensively and broadly, and perform project management responsibly.

## **II. Greater use of outsourcing**

1. Public sector should leverage the idea and creativity of private initiative from the planning phase, and outsource recovery effort to private partners more aggressively; because
2. Rebuilding the tsunami destroyed villages to the compact smart city, which is infrastructure efficient and friendly to the aged society is critical.

### **■ Present state of public organizations' collaboration with private sector**

Public organizations in Japan, such as the central and local governments, collaborate with private enterprises in various forms and styles to implement and manage their operations. When a public organization procures goods or services from private-sector companies for a project—whether for road construction, feasibility study or installation of an information system—it usually engages in general competitive bidding or designated competitive bidding. Regardless of the bidding process, the public organization must examine the entire plan, identify areas requiring external capabilities, and then determine the specifications of the goods or services to be procured.

In general, a public organization is structured such that it consists of units such as departments and divisions (e.g. civil engineering, taxation and information systems divisions) that are vertically divided according to the type of public services. After the departments and divisions secure the necessary budgets, they decide on what to procure, determine their specifications, then procure those goods or services. This is a common process for public organizations. The procurement procedures are performed in accordance with established rules concerning the disclosure of relevant information and the method of procurement. As such, public organizations conduct routine procurement activities on a daily basis.

It should be noted, however, that procurement activities are conducted based on precedent practices, the discretionary power of the parties entrusted to perform designated duties is somewhat limited, and procurement activities are conducted on a single-year basis so that they are not planned from a medium-/long-term perspective. Because of these reasons, procurement activities for upstream value-added tasks that involve the formulation of public policies and their system design and urgent mission-critical operations that must be completed within a limited time period, are relatively rare.

Furthermore, since personnel are constantly being rotated, the work environment is not likely to encourage the development of personnel willing to tackle challenging tasks. The culture of the work place with a focus on carrying out activities within the department restricts the horizons of the public sector to one job, one solution, activities. The procurement through PPP tends to become too complicated and require a change in the way of carrying out their routine works. With regard to routine procurement activities, the reference documents and procedures in standardized forms are kept so that future procurement activities can be conducted on the same basis. Because of the high turnover, there is no institutional memory and these processes, documents and standards forms are the only basis for doing procurement. Additionally, the procurement process is insufficient accountability to the population; there is lack of submitting of the procurement function while the information disclosed to the public is limited..

#### ■ Problems and issues pertaining to collaboration with private enterprises

The above procurement activities of public organizations are plagued with a number of problems even under ordinary circumstances. Moreover, as previously discussed during emergency periods, such as earthquake disasters, the following problems emerged:

1. Determination of procurement specifications was either delayed or not carried through because there was no clarity as to the type of company, (individual companies or a consortium) that could be allowed to compete in the tender. This is partially due to the lack of experience the public sector has beyond its typical

remit. In actual implementation, constraints imposed by the existing rules such as for the selection method and processes tend to impede quick and flexible procurement.

2. Without suitable benchmarks, it became difficult to collaborate with other departments or divisions (e.g. when making decisions on which department/division should be in charge of promoting disaster response activities that are cross sectoral) and make adjustments (e.g. fund procurement, cooperation with other public organizations, assistance to other public organizations, etc.) with other governmental organizations.

Public organizations perform wide range of activities, ranging from simple clerical work such as tax collections to public undertakings such as the construction of roads, sewage systems, etc. For the latter in particular, the public organization often acts as a public enterprise in charge of operating and managing projects, where it has to act efficiently. Nevertheless, since public organizations seldom possess permanently established functions for formulating or developing management plans or promoting or financing the same (counterpart to the strategic planning department, business development department, financial affairs department, etc. in a private-sector company), they are often confronted with management problems due to the lack of such related capabilities. The problems described previously are considered as manifestations of the absence of those functions or capabilities.

#### ■ Examination of corrective measures

To resolve the aforementioned issues, we propose the following:

#### **1. Establishment of special divisions in charge of management of public organizations**

Public organizations should establish special divisions that respond promptly to changes in the management environment and collaborate with many departments and divisions in the public organizations as well as external organizations, to facilitate cross functional management of their continuous operations. Those divisions should be under direct control of the head of the pertinent public organization and have adequate authorities and responsibilities. The members of these divisions should have seasoned knowledge of problems specific to individual public organizations, an extensive network of personnel in other departments/divisions, and the ability to make adjustments from the management perspective, rather than as a liaison, when cooperating

with external organizations. This is key to alleviate the issues resulted from sectionalism and bench marking precedent practice.

## **2. Outsourcing to external experts**

Activities conducted by the public organizations are indirectly related to all industries and businesses. Therefore, it is practically difficult for employees in the aforementioned special divisions of the public organizations to provide all necessary capabilities. Furthermore, with the number of public undertakings for which public organizations are responsible in mind, there is a limit to the capabilities that can be provided by the employees in the special divisions alone.

One way to obtain the necessary capabilities effectively and efficiently is to utilize the private-sector business environment or external experts who are versed in corporate planning, business development, business promotion, financial affairs, etc. Areas in which utilization of the knowledge of experts is particularly effective include the stage of formulating a concrete action plan, determining the specifications of goods or services to be procured externally for a project and selecting private-sector vendors, as well as project management, financial analysis and others.

As described thus far, key functions for the public organizations are those that enable understanding of the entire scope of management of the public organizations and allow effective collaboration with external private-sector companies for implementing the necessary actions; not only during contingency periods such as earthquakes but also during ordinary operation. Those functions can be improved by outsourcing certain management tasks of public organizations (such as formulation of plans, determination of procurement specifications, project management and financial analysis) to external experts, as well as utilizing officials of public organizations who are knowledgeable of the conditions and circumstances specific to individual public organizations.

## **III. Alternative Financing**

Use of institutional investors in infrastructure and new funds that are target at local regeneration on a business basis.

## ■ Present state of funding for public infrastructure investment

### 1. Conditions surrounding Japan

In Japan, the outstanding government debt exceeded one quadrillion yen (about US\$13 trillion) at the end of fiscal 2011, and budget deficits continue to increase the amount of debt. Moreover, it has been pointed out that huge investment will be required for the renewal of aged public infrastructure, which the government started a full-fledged construction in 1970s. The investment required during the half century from fiscal 2011 to 2060 is estimated to be 190 trillion yen (about US\$2.4 trillion).<sup>9</sup> Under these circumstances, it is necessary to promote the utilization of private funds and reduce the reliance on government bond issuance for funding for public infrastructure investment, in order to prevent any further increase in public debt.

The number of cases in which a private-sector consortium or similar uses a PPP/PFI scheme to raise funds for a public infrastructure project is increasing in Japan, but the scales of such projects remain somewhat limited. Although PFI projects totaling five trillion yen (about US\$63 billion) were executed after 1999 in Japan, most of the facilities constructed were school buildings and housing for government workers, which were provided as "services sold to the public sector." As such, PFI schemes have not been actively applied to projects for core infrastructure such as roads, water supply systems and airports.

To promote the active utilization of private funds by the public organizations of Japan against this backdrop, the PFI law was revised to expand the scope of facilities and measures introduced to promote PFI projects, such as a system to accept unsolicited proposals from private businesses and one to transfer the operating rights (i.e. concession rights) for public facilities to private-sector companies.

### 2. Trends of reconstruction investment demand resulting from Great East Japan Earthquake and its funding

Large-scale investment is being planned to restore three prefectures in the Tohoku region that were devastated by the Great East Japan Earthquake. According to the Basic Reconstruction Plan announced by the government (August 2011), the planned investment for the five-year period until the end of fiscal 2015 is anticipated to total at least about 19 trillion yen (about US\$240 billion @ \$1:80yen), nine trillion yen (about US\$110 billion) of which is scheduled to be spent on the reconstruction of infrastructure. In addition, the government forecasts that the total investment for the

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<sup>9</sup> White Paper on Land, Infrastructure, Transport and Tourism in Japan, 2009



decade up to fiscal 2020 will amount to at least 23 trillion yen (about US\$290 billion). Investment in social infrastructure is thus a key element of the reconstruction plan.

Unfortunately, the financial resources necessary for the reconstruction of disaster-stricken areas have not been allocated. In November 2011, a reconstruction financing law came into effect, allowing the government to secure part of the financial resources necessary for the reconstruction from income tax revenue. However, major issues remain that impede the smooth funding. Under such circumstances, there is a need to establish schemes that promote the effective use of private funds in Japan and from overseas.

### ■ Issues pertaining to the promotion of PPP/PFI schemes

Policies that allow the effective utilization of PPP/PFI and those for expanding the range of potential fund providers can effectively promote the use of private funds for reconstruction-related projects.

One of the issues to be addressed is the set of problems imposed by the implementation system available to the public organizations. To implement PPP/PFI, public organizations must conduct a series of life-cycle activities such as designing schemes that enable the private sector to make investment, disseminating that information and conducting appropriate monitoring. However, since target businesses for PPP/PFI vary widely and they involve complex procedures such as examination of project scheme including financial arrangement, there are shortages of personnel with the skills and experiences necessary for appropriately performing the required tasks. In addition, these time-consuming and tiresome procedures often distract municipalities to go for PPP/PFI procurement. For faster reconstruction purpose, the government should consider shorter and easier-to-implement process guideline, as well as providing technical assistances.

The second issue is economic rationality. Investors expect a return on investment; calculated based on indexes such as IRR and NPV. On the other hand, the financial administrations of the public organizations seek value for money, while residents request improved levels of services and enhanced public benefits (universal services, consideration of cost-bearing capability, etc.).

As described above, certain restrictions are imposed on private-sector investment in PPP/PFI projects in order to realize public interests. This necessitates a system that benefits private-sector investors, even under such restrictions, but establishing such a system requires adjustment with various issues such as regulations imposed by industry-specific laws, constraints due to financing conditions (interest, financing period) and the burden resulting from heavy corporate tax.

The third issue is the securing of fund providers. Given the currently limited scope of fund providers, an environment must be established for accepting funds from the private sector inside and outside Japan, including institutional investors. Although in Japan there are funds set up by trading firms and those organized by financial institutions in collaboration with overseas partners, as well as a plan for setting up public-private partnership infrastructure funds by the Tokyo metropolitan government, the number of funds and the total amount remains small. For instance, pension funds, which are representative institutional investor, consider infrastructure investment as alternative investment; however, because no adequate systems for funds have been established in Japan, it is difficult to invest such funds or individual projects.

### ■ Proposal for promotion of PPP/PFI schemes

To solve the abovementioned issues and promote the use of PPP/PFI schemes, we propose the following to the public organizations:

#### 1. Faster and easier implementation procedures

For wider use of PPP/PFI in reconstruction, Japan government do not need to reinvent completely new scheme of PPP/PFI implementation. However, regular PPP/PFI procedures require much time and experienced personnel, which are making it harder to apply PPP/PFIs in reconstruction. For some buildings/infrastructures, some typical figures and models can be used to shorten pre-implementation studies and initial designing. Deployment of experienced personnel and building a knowledge database can also shorten the process.

#### 2. Establishment of schemes, dissemination of information and securement of personnel

We propose that the private sector present a range of risks acceptable to the private sector and schemes providing benefits commensurate with such risks. If industry-specific laws become a hindrance, they should be amended in order to eliminate the encumbrances, whereupon pertinent information should be disseminated throughout the private sector, both inside and outside Japan. Furthermore, as we stated in the section on outsourcing, for securing sufficient personnel necessary to facilitate PPP operations, experts should be developed or recruited, and private advisors should be utilized effectively for operations that can be outsourced to the private sector.

### **3. Policies designed to enhance the economic rationality of investment**

If the return on investment to private-sector investors is inadequate due to the absence of subsidization systems, various preferential systems such as tax benefits, interest subsidy and subsidy programs should be adopted for PPP/PFI project participants and units of procurement should also be consolidated for the purpose of achieving economies of scale, to ensure the return on investment is commensurate with the amount invested and strengthens the incentive for private sector participation.

As mentioned in Section II 1 of Chapter II, the bill for a special zone act for reconstruction in response to the Great East Japan Earthquake received cabinet approval. It became into effect and government designated 222 municipal governments to be able to produce reconstruction promotion plans, reconstruction plans and reconstruction grant project plans. However, as stated in Section II of Chapter II, the government should make it clearer what the “Unit for Collaboration with Private Sector for Reconstruction” will do in Public Private Partnerships, how “private sector proposals” are treated, what kind of incentives are given to innovative proposers, and how these ideas are taken into account in fair and competitive manner. Also, the government should be aware of financial disciplines. Even with tax breaks and other economic incentives, private sectors are reluctant to invest in non-sustainable or non-viable communities, such as the ones in Okushiri. We recommend maximum utilization of the framework for the special zones.

### **4. Use of infrastructure funds for expansion of the scope of fund providers**

Provision of funds from those willing to provide funds but which are subject to restrictions because of the inadequacy of present systems should be promoted. At the present, establishment of national-government infrastructure funds is being planned in Japan, as stated in the Basic Reconstruction Plan announced by the government in July 2011. This plan should be realized as soon as possibly in order to establish a system that allows the effective use of long-term funds held by pension funds, insurance companies and similar.

## **IV. Improved resilience of hardware and soft ware in disaster recovery and risk mitigation**

Improved resilience of the hardware and the software in disaster recovery is necessary. Even with the tragic massive losses, the country should gain confidence with the fact that more than 95% of residents escaped and survived overall. This came from the education and evacuation drills amongst residents. Even though infrastructures such as breakwaters and sea walls succeeded to delay and lessen the severity of the tsunami, on the other hand, it had given the false sense of

security to some residents and caused unexpected loss. Early warning systems and hazard maps were also misleading in some cases. Though infrastructures in the affected area were well prepared for the earthquake itself, but not sufficient for resisting to the tsunami. Hardware or equipments/tools always have limitations and downsides, and sometimes work in totally opposite way to its intention. Thus software, including education and training among youth and adults should be improved.

In addition, better urban planning should be considered. Building high breakwater and embankment and building elderly nursing homes or hospitals near ocean would put the socially or physically weak in jeopardy. Private sectors, which are very sensitive to economic and social loss in their basing communities, should be included for safer and economically viable planning and development.

1. Spending more tax dollars in creating a false sense of security must be re-examined.
2. Escape plan, action-based early warnings to be established and training of residents to escape have to be drilled.
3. Rescue teams to be trained accordingly

## **V. Local governance and capacity**

Decentralization and local autonomy is a major norm in Japanese government structure. However, many municipalities often claim that they are not given enough authority or financial and human resources to execute the given responsibilities. In addition, longstanding pressures of restructuring municipal governments had forced them to reduce staffing, and many had lost collective institutional knowledge and skills necessary to function adequately in disaster response and reconstruction (e.g. civil engineering, urban planning, flood-control etc). Most of small municipalities do not have capability to deal with massive disaster risk control and reconstruction itself, hence, partnerships among different levels of governmental bodies and other organizations are necessary.

### **1. Strategic planning of Public-Private Partnerships and *Public-Public* Partnerships**

In the disaster reaction phase, each local government has their own emergency management program following the national guidelines. For smaller emergency occasions, they should be prepared with their own responsibility and preparation. However, in enormous emergency occasions, demands to municipal governments easily

overwhelm the capacity. In this earthquake and tsunami, local government officers were overwhelmed and exhausted with the continuous heavy workloads.

In emergency situations, some functions, such as logistics and supply of goods, examinations of damaged structures, providing shelters and housings, and other citizen-related services can be provided by the private sectors as supplemental roles for local governments. Meanwhile, for massive scale disasters, there are certain needs for local-government assistance by other municipality officials in administrative works, because local government officials can easily and quickly take parts of officials in these affected municipalities. Therefore, local governments should have their own public-public partnership schema in emergency management. This means, municipalities should plan in advance how they will receive helps/assistances from other municipalities and other organizations. With this regard, local governments should strategically assess their own resources and outside resources, and develop partnerships with other municipalities and private sectors, which can provide the necessary roles in timely manner.

## **2. Coordination by national/prefectural governments for optimized resources allocation**

If the impact or scale of a disaster exceeds the capability of municipalities and their partnership scheme, prefectural government or national government should provide coordinating function for faster and optimized allocation of resources. This time, many municipalities in the coastal area could not issue the request for assistance to prefectures or to their partnering cities. Many municipalities came to these areas to help without requests or coordination. Even though national government developed a scheme for deployment of mid to long term personnel, such coordinating function is necessary in the early reaction phase because it is the time when devastated municipalities need helps the most.

## **3. Assistance for better governance for consistency and sustainability**

To make above stated partnerships amongst organizations, government should develop a better governance or monitoring structure for these municipalities, and help them implement it. Partnerships structures, particularly in Public-Private Partnership will require public entities to have mid- to long-term managing and monitoring functions, which most municipalities do not have. As stated earlier, there should be a mechanism to provide necessary technical assistances to the devastated communities, which include the assistances on better monitoring and governance skills. These will help to build a larger capacity among municipalities across Japan.

## **VI. Economic Development with biomass industry creation**

Tohoku area needs strong economic development programs for recovery. The area needs jobs, which are lost by tsunami; fisheries, agriculture, manufacturing and other industries. This report recommended the introduction of biomass power generation in Tohoku utilizing first the debris from tsunamis. The plan is under way. Tohoku must produce the products, which can be used at those power plants after the debris are consumed. Tohoku and Japan are covered by forest, which can be used for economic development. Biomass industry can be an industry in Tohoku and Japan, which can produce the needed electricity to meet the future challenge for Tohoku and Japan.

At the same time, the wood pellet industry requires jobs. The ratio of the jobs by wood pellet factory and the tree replanting are 1 to 3. If the factory requires 100 jobs then the tree replanting requires 300. Transporting the products to the power plant and other related jobs can also create another 100 jobs. Tohoku can generate these jobs for those who lost jobs by major tsunami hits in the region. Japan produces 0.06% of the world total wood pellet productions. Tohoku can start and Japan can follow. Only several of nuclear power plants out of 55 plants are under operation in Japan. It may be very difficult to restart all those power plants in Japan. Japan may not be able to rely on the future power needs from nuclear, which counts approx. 30%. There will be limit to how much more fossil power generation can be built in the country. There should be more solar, wind, and other more sustainable power generation in Japan. Japan can utilize the 67% of the country covering forest to generate additional power for the country.

Biomass also can contribute toward more environmentally controlled and more sustainable power generation system not only for Japan but also for other developing nations in Asia, which are growing very rapidly and trying to use more traditional fossil power for the growth. Japan can show the leadership in developing more sustainable power generation and thus helping other nations to follow so that they may not have to use those environmentally sensitive forests for growth.



## Closing

I would like to thank all those who joined us in the mission to Japan in July and November last year and contribute for the report we are putting together.

The United Nations Economic Commission for Europe (UNECE) with the support of Toyo University PPP Graduate School dispatched its first observation mission to Sendai, Miyagi Prefecture (Capital Sendai) in July, 2011. Second mission was joined by the United Nations International strategy on Disaster Risk Mitigation (UNISDR) and supported by Toyo University Research Center for PPP and its PPP graduate school on 15-18 November 2011. The mission has visited the coastal areas of Iwate Prefecture, most severely affected by tsunami and the coasts of Miyagi to observe what has happened and to explore the possible role of PPP in the process in disaster recovery and how PPP practically can be used in the Japanese recovery process.

During and after the visit to the tsunami hit areas, the mission members have examined the possibility of the role of and the way forward for Tohoku with the use of PPP.

The mission members have looked into:

1. The overall policy that offers vision, leadership, effective coordination and implementation
2. Building safer and more resilient infrastructure
3. Sustainable development (renewable and smart cities) and green growth
4. Forging regional economic competitiveness
5. PPP and building local and national PPP capabilities.

During the missions to Tohoku in July and November, the mission was informed by Toyo PPP School that other parts of Japan (Tokai – Pacific Central, Nankai – Pacific West and Tokyo Metro regions have high possibility of the significant size of earthquake and followed by tsunami in similar and maybe even bigger incidents in the very near future.

In the end, the mission members have made several key recommendations to the countries with threat of earthquake and tsunami including Japan and other nations, which have similar threats. The recommendations are bold and aggressive but the members all felt these recommendations could save the lives and assets of the citizens of the countries and can better prepare for the future disasters.

Unfortunately, the disasters will happen. It was fourth significant tsunami disaster in 107 years in Tohoku. It will happen again more so with the global weather change. We sincerely hope that this report provides some useful recommendations for not only Japan but also for the countries, which have such possibilities of earthquake and tsunami to be better prepared for future possibilities.

The report is intended to support the future actions of the countries in the world to consider against disasters and tsunami but not intended to offend the actions and measures taken by the country of Japan, which were very significant.

March, 2012

Geoffrey Hamilton

Chief, Cooperation and Partnerships Section

Economic Cooperation and Integration Division

United Nations Economic Commission for Europe

The UN-led delegations would like to express sincere gratitude to the following people who have kindly devoted their time and shared their experiences and opinions:

◇ July 2011

Development Bank of Japan, Tohoku Branch

Mr. Takahiro Suzuki

City of Sendai

Vice Mayor Mr. Yukimoto Ito

◇ November 2011

Japan Project-Industry Council/Sangyoshinko, Kajima, Takeei JV

Mr. Junichi Yoshiura, Manager of Debris collection and segregation site in Kamaishi

Mr. Kazuhiko Oka, Senior Manager, Kajima

City of Kamaishi

Mr. Yoshikatsu Yamazaki, Director of Citizen cooperation division

Mr. Yoshikazu Shimada, vice secretary-general, Office of Reconstruction Promotion

Mr. Masanobu Horaguchi, Director of Construction and Civil works

Otsuchi town

Ms. Yuko Suemura, Special Advisor to Reconstruction Department of Otsuchi

City of Tono

Mayor Mr. Toshiaki Honda

Vice Mayor Mr. Masunori Oikawa

Mr. Yasuo Kikuchi Director of Logistic Support Room for Coastal devastated Areas

Tohoku Regional Development Bureau, Ministry of Land, Infrastructure, Transport and Tourism

Mr. Naoki Kawashima, Director of Planning division

We have also met with:

Kesenuma Reconstruction Association

Mr. Mitsuo Kikuchi, Director of Planing division, City of Rikuzentakata

Japan Platform

Tono Magokoro net and Tono Social Welfare Council

**The Mission Participants and Report Contributors:**

UN Mission:

Nobuyuki Nagata, Deloitte Tokyo

Khalid Mehmood Shaikh, Director Public Private Partnership Unit, Sindh, Pakistan

Arthur Mitchell, Senior Counselor, White & Case Japan

Yoshie Muramatsu, Senior Project Manager, Arup Japan

UNISDR contributors:

Akira Morimoto, Expert at International Recovery Platform

Sandra Wu, Wen-Hsiu, President & CEO, Kokusai Kogyo Group Tokyo

Sanjaya Bhatia, Knowledge Management Officer, International Recovery Platform

Toyo University:

Yuji Nemoto, Professor, Toyo University

Sam Tabuchi, Professor, Toyo University

Yu Namba, Senior Staff, Toyo University

## Appendix 1

Year	Month	Day	Public Body	Activities
2011	3	11	<b>National Gov.</b>	Establishment of Extreme Disaster Management Headquarters Dispatched Self Defense Force and Disaster Medical Assistance Teams Declaration of Nuclear emergency, Establishment of Nuclear Disaster Management Headquarters
	3	12	<b>National Gov.</b>	Designation of extremely severe disaster (nationwide), and Established Emergency operations center in Miyagi Notice of Special measures for Small and Medium Enterprises suffering damages
	3	13	<b>National Gov.</b>	Government ordinance on Specific disaster and counter measures
	3	16		Reopened Iwate–Hanamaki Airport for commercial flights
	3	17	<b>National Gov.</b>	Establishment of Livelihood Support HQ for disaster victims
	3	18	<b>National Gov.</b>	Notice of Special allocation tax for accepting evacuee
	3	21		Water supply recovered for 1.2 million households, but still suspended for 0.9million
	3	22	<b>National Gov.</b>	Established Inter–ministry liaison conference for livelihood support for disaster victims
	3	24		Re–opened Tohoku Expressway
	3	26		Total number of Evacuees 250,000
	3	28	<b>National Gov.</b>	Estimation of amount of damage 25trillion yen
	3	29		Sendai Airport opened for relief teams
	3	30	<b>C of Kuji</b>	Establishment of Fukkyu/Fukko HQ
	4	1	<b>C of Sendai</b>	Formulation of Reconstruction basic policy
	4	5	<b>Iwate Pref.</b>	Consultation office for management and rehabilitation of agriculture
	4	6	<b>National Gov.</b>	Estimated amount of debris in 3 prefectures 24million tons
	4	7		Largest aftershock
	4	8	<b>Miyagi Pref.</b> <b>National Gov.</b>	Prohibited construction of buildings in Tsunami inundated areas 76.2billion yen was distributed to devastated municipalities as special allocation tax



4	11	<b>National Gov. Miyagi Pref. C of Ishinomaki Iwate Pref. C of Kamaishi</b>	Establishment of Reconstruction Design Council Working Draft of Reconstruction Basic policy Establishment of Reconstruction office Basic policy for reconstruction from earthquake and tsunami Basic policy for reconstruction design
4	13	<b>National Gov.</b>	Sendai Airport partially re opened for commercial flights Decided exceptional measures for taxing
4	22	<b>National Gov.</b>	Extended duration of building regulation in devastated area to 8 month
4	25	<b>Iwate Pref.</b>	Establishment of Reconstruction Office
4	27	<b>C of Ishinomaki National Gov.</b>	Basic policy for reconstruction A special tax-exemption law for disaster victims
4	28	<b>National Gov.</b>	Set up a database for privately owned housing for refugee relocation
4	29		Tohoku Shinkansen reopened
5	1	<b>T of Yamada C of Rikuzentakata T of Noda C of Sendai T of Onagawa</b>	Establishment of Reconstruction promotion office Establishment of Reconstruction countermeasures office Establishment of Reconstruction office Establishment of Reconstruction promotion office Establishment of Reconstruction planning committee
5	2	<b>National Gov.</b>	1st supplemental budget for FY2011 Act on Special Financial assistance and grant for disaster countermeasures
5	8	<b>T of Minamisanriku</b>	Framework and organization for Reconstruction basic policy
5	10	<b>National Gov.</b>	Reconstruction Design Council published 7 principles for reconstruction
5	13	<b>Diet</b>	Presentation of Organic Act of Reconstruction bill
5	16	<b>C of Rikuzentakata</b>	Basic policy for reconstruction
5	17	<b>Cabinet</b>	Cabinet decided policy guidelines for Japan's Recovery—basic principles for economy and financial management after the disaster
5	20	<b>T of Ishinomaki</b>	Framework for Reconstruction
5	23	<b>T of Yamada</b>	Basic policies for reconstruction plan
5	27	<b>National Gov. Miyagi Pref. T of Noda</b>	Solicitation for PFI/PPP proposals for reconstruction Published first working draft of reconstruction plan Basic policy for reconstruction

5	31	<b>C of Sendai</b>	Published Vision for Reconstruction
6	1	<b>T of Miyako</b> <b>T of Noda</b> <b>T of Hirono</b> <b>T of Fudai</b> <b>Tawn of Watari</b> <b>C of Tagajo</b>	Basic plan for reconstruction Basic plan for reconstruction Vision for reconstruction Basic plan for reconstruction planning Establishment of Reconstruction Committee Establishment of Reconstruction Promotion Office
6	5	<b>C of Natori</b>	Public meeting for Reconstruction
6	6	<b>Fire and Rescue</b>	Finished activities in devastated area (total of 100,000 officials)
6	9	<b>T of Otuchi</b>	Basic policy for reconstruction
6	11		15,413 lost, 8,069 missing
6	15	<b>National Gov.</b>	7 ministries established Inter-ministry liaison conference for reconstruction planning support
6	17	<b>National Gov.</b> <b>Iwate Pref.</b> <b>Miyagi Pref.</b>	Policies regarding disaster-related double loans Working draft of reconstruction basic plan 1st working draft of reconstruction plan
6	20	<b>Diet</b>	Bill of Organic act of reconstruction passed
6	24	<b>National Gov.</b>  <b>C of Ishinomaki</b>	Estimation of damages 16.9 trillion yen (Buildings 10.4 trillion yen, social infrastructures 2.2 trillion, agriculture, forestry and fishing related facilities 1.9 trillion, lifelines 1.3 trillion) Draft Basic Design for disaster-resistant city
6	25	<b>National Gov.</b>	Reconstruction Design Council made suggestions to Prime Minister
6	26	<b>National Gov.</b>	Central Disaster Management Council published an Intrim report on earthquake and tsunami measures, based on the lessons learned from the Great Eastern Japan Earthquake
6	27	<b>Cabinet</b>  <b>Miyagi Pref.</b> <b>T of Minamisanriku</b>	Mr. Matusmoto was appointed for Minister in charge for reconstruction Special lending facility for SMEs Draft of Basic policy for reconstruction
6	29	<b>T of Yamada</b>	Vision for reconstruction from Earthquake and Tsunami
7	4	<b>C of Sendai</b>	Published basic policy for reconstruction
7	5	<b>Cabinet</b>	Minister Matsumoto resigned and Mr. Hirano appointed
7	8	<b>C of Ofunato</b> <b>Miyagi Pref.</b>	Decided Framework for reconstruction plan Committee for reconstruction vision suggested future vision to prefecture

7	11	<b>C of Kamaishi</b>	Published basic plan for reconstruction design
7	22	<b>National Gov. Fukushima Pref.</b>	Guideline for land use controls for promoting smooth private participation Published Roadmap for recovery
7	25	<b>National Gov.</b>	2nd supplemental budget for FY2011 Sendai Airport reopened for all domestic flights
7	29	<b>National Gov.</b>	Decided Basic policy for reconstruction
8	3	<b>National Gov. Iwate Pref.</b>	Council for Realization of New Growth Strategy published Draft of Strategy for Revitalization of Japan Decided draft of Reconstruction implementation plan and Basic policy of radiation countermeasures
8	11	<b>Fukushima Pref. Iwate Pref. National Gov.</b>	Published Reconstruction Vision Decided Reconstruction plan and dismissed emergency control HQ More than 56,000 public officials from prefectural and municipal governments had been sent to devastated areas (as of July 1)
8	13	<b>C of Tagajo</b>	Published Framework of reconstruction plan
8	17	<b>Miyagi Pref. C of Ishinomaki</b>	Published final draft of reconstruction plan Framework of basic plan for reconstruction
8	18	<b>National Gov</b>	Enforced Act of special measures for disaster debris handling
8	22	<b>C of Ishinomaki</b>	Published basic reconstruction plan for urban infrastructures
8	26	<b>National Gov.</b>	Decided Master plan for recovery of agricultural industry and agricultural land
9	2	<b>National Gov. C of Natori</b>	Noda Administration took in the office Published Draft of reconstruction plan
9	5	<b>T of Watari</b>	Decided Basic policy for reconstruction
9	11	<b>National Gov.</b>	Extended duration of building regulation in devastated area
9	12	<b>C of Kesenuma</b>	Public committee for reconstruction suggested reconstruction projects and proposals to the city
9	16	<b>T of Iwaizumi</b>	Decided Reconstruction plan
9	22	<b>C of Sendai</b>	Published Interim plan for reconstruction
9	23		Tohoku Shinkansen back to normal timetable
9	25		Sendai Airport finished rehabilitation and reopened for international flights
9	29	<b>National Gov.</b>	Council for Social Infrastructure published proposal for reconstruction to realize sustainable society

			Decided Reconstruction plan Decided Basic plan for Reconstruction
		<b>T of Fudai</b> <b>T of Tanohata</b>	
10	1	<b>T of Watari</b>	Published draft of Reconstruction plan
10	4	<b>T of Minamisanriku</b>	Decided Working draft of Reconstruction plan
10	7	<b>C of Kesenuma</b>	Decided Reconstruction plan
10	19	<b>Miyagi Pref.</b>	Published Reconstruction plan
10	28	<b>Cabinet</b>	Decided Bill of financing reconstruction project, Bill of Special Reconstruction Zones, Bill of Development of tsunami resistant communities
10	31	<b>C of Ofunato</b> <b>C of Miyako</b>	Decided Reconstruction plan Decided Basic plan for reconstruction
11	1	<b>Cabinet</b>	Decided Act of establishment of Reconstruction Agency
11	11	<b>Iwate Pref.</b>	Established Organization for Industry Recovery
11	18	<b>T of Rifu</b>	Published Framework for reconstruction plan
11	21	<b>National Gov.</b>	3rd supplemental budget for FY2011
11	30	<b>C of Sendai</b> <b>Diet</b>	Final decision on Reconstruction plan, and implementation of actual projects within FY2011 Passed bill of financing reconstruction projects
12	7	<b>Diet</b> <b>Miyagi Pref.</b>	Passed Bill of Special Reconstruction Zones, Bill of Development of tsunami resistant communities Estimated shortage of public officials by 1,262 in 15 cities and towns, and requested additional support from national gov.
12	8	<b>Miyagi Pref.</b>	Published Restructuring policy of fishery harbors (142 into 60)
12	9	<b>Diet</b>	Passed Bill of Establishment of Reconstruction Agency
12	20	<b>C of Kamaishi</b> <b>C of Tome</b>	13 households in Toni agreed on relocation plan Published reconstruction plan
12	26	<b>T of Otuchi</b> <b>Self Defense Force</b>	Decided reconstruction plan Withdrew from all disaster affected areas
12	27	<b>Diet</b>	Enforced Act of Development of tsunami resistant communities
2012	1	27 <b>Miyagi Pref and 34 cities</b>	Filed proposal of Special Zones for promotion of private investment, in which corporate taxes are exempted for 5 years
	2	10 <b>National Gov.</b>	Establishment of Reconstruction Agency

3

11

One year anniversary

【Confirmed Damage】Lost 15,854, Missing 3,276, Evacuated  
343,935

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(Table made from Toyo University's "1000 days Chronicle")