Natural Disaster Risk Assessment and Area Business Continuity Plan Formulation for Industrial Agglomerated Areas in the ASEAN Region

Study Report 3

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AHA CENTRE

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Chapter 1 Introduction

Study Report 3 summaries results of two tasks carried out during June and September, 2013. The first task was to hold the second meetings in the pilot agglomerated areas in Indonesia, the Philippines and Viet Nam. The second task was to conduct a field study in the three pilot industrial agglomerated areas and their surroundings located in three countries. Location of the pilot industrial agglomerated areas, periods of visit by the Study Team, and dates and locations of the second meetings are summarized in Table 1.1.1

Country	Location of Pilot Industrial Agglomerated Ares	Period of Visit by Study Team	Date and Location of the Second Meeting
Viet Nam	Hai Phong	July 31, 2013 ~ August 10, 2013	September 19, 2013 *), Hai Phong
Philippines	Cavite State, Laguna States and Southern Part of Metropolitan Manila	August 11, 2013 ~ August 17, 2013	August 13, 2013 Manila
Indonesia	Bekasi Regency and Karawang Regency	August 18, 2013 ~ August 29, 2013	August 22, 2013 Bandung

Table 1.1 Period of the Visits by the Study Team and Date and Location of the 2nd Meetings

*) The meeting in Viet Nam, which had been originally planned to hold on August 8, 2013, was cancelled due to the typhoon No. 6 "MANGKHUT" and postponed to September 19, 2013.

The second meetings were one of the tasks, as shown in Figure 1.1, to develop Area Business Continuity Plans for the pilot agglomerated areas, and had an objective to form working groups in three countries. The working group in each country is composed of stakeholders who are expected to involve actively in discussion for developing the Area Business Continuity Plan for their industrial agglomerated area.



Figure 1.1 Tasks to Form Area BCP

The field study, which was also one of the tasks to develop the Area Business Continuity Plan, had objective to collect basic data and information of the pilot industrial agglomerated areas and their surroundings in three countries. These are utilized, as shown in Figure 1.1, for assessment of hazards and risks of natural disasters, for providing scenarios of natural disaster and for developing the Area Business Continuity Plans. The Study Team visited the pilot areas to conduct site inspection, collect data and information, and coordinate with local subcontractors who carried out field survey.

Results of the meetings are summarized in Chapter 2. Results of the field study of the pilot areas in Indonesia, the Philippines and Viet Nam are presented in Chapter 3, Chapter 4 and Chapter 5, respectively. The results contain:

- Outline of the pilot area,
- Outline of the local governments of the pilot area,
- Hazards of the pilot area,
- Industrial agglomerated areas of the pilot area
- Infrastructure of the pilot area and surroundings
- Public services of the pilot area
- Economic relationship with surrounding countries and Japan
- Status of BCP implementation
- Measures for disaster risk reduction

For Viet Nam, actions taken by the national government, local government, public and industry for the typhoon 5 JEBI are summarized.

Chapter 2 Working Group Meeting for Area BCP Formulation

2.1 Indonesia

2.1.1 Summary of the Working Group Meeting

Regarding the Working Group Meeting held in Indonesia, BAPPEDA, the West Jawa Province government sent invitations to the concerning governmental agencies and other organizations and private companies, hence many organizations described below participated in the Meeting. Since Prof. Krishina of Institut Teknologi Bandung (ITB) acted as a moderator, the meeting went very smoothly. The following is the summary of the meeting.

Date	August 22 nd , 2013 (Thu) 10:00 - 15:00	
Place	Bandung, West Jawa Province, Republic of Indonesia	
Guest	Mr. Norio Matsuda (JICA Jakarta)	
(Opening	Mr. Ahmad Mulyadi (Director-General, Regional Disaster Management Agency,	
address)	BPBD, West Jawa Province)	
	Mr. Husen Ahmad (Director-General, Regional Development and Planning Agency,	
	BAPPEDA, West Jawa Province)	
Moderator	Dr. Krishina S. Pribadi (Institut Teknologi Bandung (ITB))	
Participants	Total: 63 persons (excluding project members)	
	• The governmental agency (18 organizations, 40 persons):	
	West Jawa Province, Karawang Regency, Bekasi Regency, Bekasi City etc.	
	• Infrastructure and Lifeline companies (9 companies, 17 persons):	
	Water and sewerage, Highway, Power, Communications company etc.	
	• Private Companies etc. (4 companies, 5 persons):	
	KIIC (industrial park), PT Toyota Astra Motor, Employers Associations	
	• Research Institution (1 institute, 1 person):	
	Badan Geologi	
Proceedings	The presentation by JICA Study Team and Questions & Answers by participants	
	• Introduction of the Project, the Pilot Study in Indonesia and Composition of	
	Working Group	
	• Natural Disaster Risk Assessment for Area BCP	
	• Introduction of BCP and Area BCP and Method of Area BCP Formulation	
	Plan of the Future Workshops	

 Table 2.1.1
 Summary of the Working Group Meeting in Indonesia

Here is the agenda of the Working Group Meeting, for reference.

MEETING AGENDA			
09.30-10.00	Registration		
10.00-10.05	Welcome Address	MC	
10.05-10.30	Opening Address • Speech from JICA Jakarta • Speech from BPBD West Jawa • Speech and opening from BAPPEDA West Jawa	Mr. Norio Matsuda Mr. Ahmad Mulyadi Mr. Husen Ahmad	Moderator: Krishna S. Pribadi MC: Lina (BAPPEDA West Jawa)
10.30-11.00	Introduction of the Project, the Pilot Study in Indonesia and Composition of Working Group	Dr. Masakazu Takahashi Study Team Leader	
11.00-11.20	Q & A		
11:20-11:30	Coffee Break		
11.30-12.00	Natural Disaster Risk Assessment for Area BCP	Mr. Shukyo Segawa Leader of Natural Disaster Risk Assessment	
12.00-12.20	Q & A		
12:20-13:30	Lunch		
13:30-14.10	Introduction of BCP and Area BCP and Method of Area BCP Formulation	Mr. Yoshiki Kinehara Area BCP	
14.10-14.30	Q & A		
14.30-14.50	Plan of the Future Workshops	Dr. Masakazu Takahashi	
14.50-15.00	Closing Remarks	BAPPEDA West Jawa	
15:00	Adjournment		

Table2.1.2Meeting Agenda

2.2 The Philippines

2.2.1 Summary of the Working Group Meeting

Regarding the Working Group Meeting held in the Philippines, National Disaster Risk Reduction and Management Council (NDRRMC) sent invitations to the concerned governmental agencies, other organizations and private companies. 37 participants from 29 organizations participated in the Meeting.

One day before the Meeting was organized, August 12, 2013, Typhoon No.11 hit Aurora states in Luzon Island. This typhoon caused 11 death, 7 injured, 3missing people and 395,723victims. Even though NNDRMC was responding the typhoon damage, the meeting was held as scheduled and Mr. Eduardo D. Del Rosario, Under Secretary/ Executive Director and Administrator of Office Civil Defense, participated. NNDRMC recognizes their role and organized the meeting actively.

Table 2.2.1 shows summary of the meeting.

Table 2.2.1	Summary of the V	Vorking Group	Meeting in the	Philippines
	•			11

Date	August 13, 2013(Tue) 9:00 ~15:30	
Place	Eastwood Richmond Hotel, Metro Manila, Republic of the Philippines	
Participants	Total: 38 persons (excluding project members)	
	• The governmental agency (4 organizations, 10 persons):	
	NDRRMC, Metro Manila Development Agency, Province of Cavite and	
	province of Laguna	
	• Infrastructure and Lifeline companies (9 companies, 17 persons):	
	Water and sewerage, Highway, Power, Communications company etc.	
	• Private Companies etc. (7 companies, 8 persons)::	
	Cavite Economic Zone, Laguna Technopark, Philippine Chamber of Commerce	
	and Industry	
	• Research Institution (3 institute, 3 person):	
	Philippine Institute of Volcanology and Seismology (PHIVOLCS), The	
	Philippine Atmospheric, Geophysical and Astronomical Services Administration	
	(PAGASA) etc.	
Proceedings	The presentation by JICA Study Team and Questions & Answers by participants.	
	• Introduction of the Project, the Pilot Study in the Philippines and Composition of	
	Working Group	
	• Natural Disaster Risk Assessment for Area BCP	
	• Introduction of BCP and Area BCP and Method of Area BCP Formulation	
	Plan of the Future Workshops	
JICA	Hideki Matsumoto (JICA Head Quarter)	
	Hayato Nakamura (JICA Pilippine Office)	
	Kazushi Suzuki (JICA Pilippine Office)	

	Takaaki Kusakabe JICA Expert (OCD Policy Advisor)
Moderator	Dr. Ramon J Santiago

	MEETING AGENI	DA
8:30	Registration	
9:00	Welcome Address	MC
9:05	Opening Remarks	Mr. NAKAMURA (JICA Manila)
9:15	Introduction of the Project,	DR. MASAKAZU
	Pilot Study in the Philippines and	TAKAHASHI,
	Composition of Working Group	Project Team Leader
9:45	Q & A	
10:10	Natural Disaster Risk Assessment for	Dr. Masakazu Takahashi
	Area BCP	
10:30	Q & A	
10:50	Coffee Break	
11:10	Introduction of BCP and Area BCP	MR. YOSHIYUKI TSUJI
		Deputy Team Leader
11:40	Q & A	
12:10	Lunch	
13:10	Method of Area BCP Formulation	Mr. Yoshiyuki Tsuji
13:40	Discussion	
14:10	Plan of the Future Workshops	Dr. Masakazu Takahashi
14:30	Break	
15:10	Closing Remarks	OCD
	Adjournment	

Table2.2.2Meeting Agenda

2.3 Vietnam

2.3.1 Summary of the Working Group Meeting

Regarding the Working Group Meeting held in Hai Phong, Viet Nam, the Hai Phong People's Committee sent invitations to the concerning governmental agencies and other organizations and private companies; hence many organizations described below participated in the Meeting. The following is the summary of the meeting.

Date	September 19 th , 2013 (Thu) 8:30 - 12:00		
Place	Nam Nuong Hotel, Hai Phong, Viet Nam		
Guest	Dr. Nguyen Huu Phuc, (Ministry of Agriculture and Rural Development)		
(Opening			
address)			
MC	Ms. Hoang Minh Nguyet		
Participants	Total: 29 persons (excluding project members)		
	• The governmental agency (10 organizations, 15 persons):		
	Ministry of Agriculture and Rural Development, Hai Phong People's		
	Committee		
	• Infrastructure and Lifeline companies (4 companies, 4 persons):		
	Water and sewerage, Airport, Electricity, Port		
• Private Companies etc. (4 companies, 5 persons):			
	VCCI, NHIZ (industrial park), Tohoku Pioneer Co., Ltd., TVTECH		
	• Research Institution (2 institute, 2 persons):		
	Geo-environment and Territorial Institution Center, Hydro-Meteorological		
	Station of Northern Region		
	• Media (3 companies, 3 persons):		
	Hai Phong Newspaper, Security Newspaper, Hai Phong Television		
Proceedings	The presentation by JICA Study Team and Questions & Answers by participants		
	• Introduction of the Project, the Pilot Study in Viet Nam and Composition of		
	Working Group		
	• Natural Disaster Risk Assessment for Area BCP		
	• Introduction of BCP and Area BCP and Method of Area BCP Formulation		
	Plan of the Future Workshops		

 Table 2.3.1
 Summary of the Working Group Meeting in Vietnam

Here is the agenda of the Working Group Meeting, for reference.

Table2.3.2 Meeting Agenda

MEETING AGENDA				
08.00-8.30	Registration			
8.30-8.40	Welcome Address Ministry of Agriculture and Rural Development	Dr. Nguyen Huu Phuc		
8.40-9.20	Introduction of the Project, the Pilot Study in Indonesia and Composition of Working	Dr. Masakazu Takahashi Study Team Leader	MC: Ms. Hoang Minh Nguyet	

MEETING AGENDA				
	Group			
9.20-9.45	Q & A			
9.45-10.10	Natural Disaster Risk Assessment for Area BCP	Mr. Shukyo Segawa Leader of Natural Disaster Risk Assessment		
10.10-10.30	Q & A			
10:30-10.45	Coffee Break			
10:45-11.25	Introduction of BCP and Area BCP and Method of Area BCP Formulation	Mr. Yoshiyuki Tsuji Area BCP		
11.25-11.50	Q & A			
11.50-12.00	Plan of the Future Workshops	Dr. Masakazu Takahashi		
12.00	Adjournment			
12.00-13.00	Lunch			

Chapter 3 Profile on the Pilot Area in Indonesia

In Indonesia, as one of the three pilot countries, the Area Business Continuity Plan is simulated in the agglomerated industrial area consisted of 12 industrial parks in West Java Province, i.e. Kota Bekasi, Kabupaten Bekasi and Kabupaten Karawang. In Chapter 3, the profile of the pilot area is introduced with the results both from Interviews and Questionnaire Survey conducted in August 2013.

3.1 The Outline of Pilot Areas of the Project (Indonesia)

3.1.1 Basic Information on the Pilot Areas

In Indonesia, the following three local governments, inside West Jawa province, were selected as pilot area.

Karawang Regency (in Indonesian: Kabupaten Karawang) Bekasi Regency (in Indonesian: Kabupaten Bekasi) Bekasi City (in Indonesian: Kota Bekasi)

In Karawang Regency and Bekasi Regency, there are many industrial parks where many Japanese companies are doing business. And, almost 60-70 percent of the total industries in West Jawa province are aggregating in these areas.

Local governance system of Indonesia is divided into "Province (Provinsi)", "Regency (Kabupaten)", and "City (Kota)", and they are said to be highly independent and have relatively large power and authority. Regencies and Cities are equivalent and mutually independent unlike Japan.



Figure 3.1.1 Distribution of Pilot Areas¹

¹ POSKOTA Website:

 $[\]label{eq:http://poskota.co.id/berita-terkini/2011/04/08/pemekaran-jawa-barat-terhambat-dana ASEAN-Japan Centre Website: http://www.asean.or.jp/ja/asean/know/country/indonesia.html (in Japanese) \end{tabular}$

Area	West Jawa province: 34,816.96 km ²	
	Karawang Regency : 1,737.3 km ²	
	Bekasi Regency : 1,484.4 km ²	
	Bekasi City : 210.49 km ²	
Population (as of 2010)	West Jawa province: 43,053,732	
	Karawang Regency : 2,135,200	
	Bekasi Regency : 2,642,578	
	Bekasi City : 2,378,211	
Natural Condition	The pilot areas are in tropical rain forest climate, and there are rainy	
	and dry season. In the rainy season, the flood risk becomes high in	
	some parts of the areas.	
Other features	Most of the industries in West Jawa province are aggregating in	
	these pilot areas.	

3.2 The Outline of the Local Authorities

3.2.1 The Local Administration System of Indonesia

As mentioned previously, the local governance system of Indonesia is divided into "Province" governments, and "Regency" or "City" governments.

(In addition, other than above, there are the units of "Subdistrict (Kecamatan)" and "Administrative Village (Kelurahan)" as an internal mechanism of the regency and city governments, and also "Natural Village" which performs traditional self-governance.)

Each local government has lower administrative organization such as secretariat office, administration offices, technical organizations and agencies, etc. under the local chief executive and the vice local chief executive, and each body performs each assigned task. For example, BAPPEDA (Badan Perencanaan Pembangunan. Daerah = Regional Development Planning Agency) is in charge of city planning and infrastructure development, and BPBD (Badan Penanggulangan Bencana Daerah = Regional Disaster Management Agency) is in charge of the natural disaster management.

BPBD is regional affiliated agency of BNPB (Badan Nasional Penanggulangan Bencana = National Disaster Mitigation Agency), which is a central administrative body. BNPB, which was established in 2008 as a non-departmental agency similar to the ministries, is a comprehensive disaster management implementation and coordination body. BPBD is supposed to be established at every province, regency, and city. All 33 provinces already have BPBD, while just 395 out of all regencies and cities have BPBD as of 2012.

The followings are governance system of local authorities in Indonesia, and Indonesia's Disaster Management Structure.



Figure 3.2.1 Governance System of Local Authorities In Indonesia²



Figure 3.2.2 Indonesia's Disaster Management Structure ³

The outlines of each local government in the pilot areas are described after 3.2.2.

3.2.2 West Jawa Province

West Jawa is one of the province governments located in western part of Jawa Island. There are 17 regencies and 9 cities inside the province, such as Karawang Regency, Bekasi Regency and Bekasi

² Council of Local Authorities for International Relations. (2009). Local Authorities in Indonesia. (in Japanese)

³ Japan International Cooperation Agency (JICA). (2012). Data collection survey on ASEAN regional collaboration in disaster management, Draft final report, Country report Indonesia.

City etc. which are the pilot areas of the study. It has the largest population and the highest population density in Indonesia. Also, it is one of the main industrial areas in Indonesia, and many industrial parks including those invested by foreign companies such as Japan and South Korea, have gathered in this province. Provincial capital is Bandung.

3.2.3 Karawang Regency

In Karawang Regency, there are many industrial parks such as KIIC (Karawang International Industrial City), which is a pilot industrial park of this study. KIIC is developed and managed by ITOCHU Corporation, under the collaboration with Sinar Mas Group (Indonesian local capital), and many Japanese companies are also in KIICl. It is less than 60km (over an hour by car) from the central part of Jakarta to Karawang Regency.

3.2.4 Bekasi Regency

There are also many industrial parks just like Karawang Regency, and since it is near from Jakarta, it is one of the leading industrial areas in the West Jawa Province. In Cikarang, a central city of Bekasi Regency, there is Jababeka Industrial Park, which is the largest scale of industrial park in Southeast Asia. Cikarang is located in the middle of Bekasi City and Karawang Regency, and it is about 50 minutes by car from the central part of Jakarta.

3.2.5 Bekasi City

It is a part of Jabotabek which means the city zone around Jakarta. It is about 30-40 minutes by car from the central part of Jakarta. It has large population as a "bedroom suburb". There are also many industries, and many local and foreign companies including Japanese companies are developing their business in this area. However, within the city, there are very few industrial areas where manufacturing companies are aggregating in this city.

3.3 Natural Hazards at the Pilot Area

3.3.1 Flood

(1) The pilot area is the part of Kab.Bekasi and Kab Karawang where the industrial estates are located. The floods in the pilot area are caused by storm rainfalls of monsoons and big floods are recorded in February 2002, February 2005, February 2007, March 2010 and January 2013. The four rivers of the Citarum (4,500 km²), Cibeet (534 m²), Cikarang (218 m²) and Bekasi River (333 m²) have caused floods. There are habitual inundation areas identified at the downstream of the confluence of the Cibeet to the Citarum at Karawang City, the downstream of the Cikarang and the Bekasi River.

(2) The industrial estates are generally located in the higher ground level and they are not under the menace of the direct flood disaster risks. However, social infrastructure such as roads and other life lines in the surrounding areas are vulnerable to flood disaster risks and the logistics system and the workforce could be affected. As a result the industrial estates could not escape the indirect disaster risks.

(3) The pilot area is located in the mid streams of the rivers, and affected by the development of their upper basins which are decreasing forest areas, changing land uses and increasing runoff. The upper basin area of the Citarum is the large city of Bandung and the upper basin of the Cibeet, Cikarang and Bekasi is the development area of Bogor. It is clear that the both areas will be developing and expanding, and increasing flood runoff. The necessity of flood control facilities are suggested in order to cope with the increase of runoff. Though kab. Bekashi and Kab. Karawang have prepared their future development plans, it is necessary for the area to develop sustainable development plans from disaster risk reduction management aspects.

(4) In the Citarum River Basin there are three (3) dams (Saguling, Cirata and Jatilhur) and two (2) weirs (Curug and walahar) and the 59% of the water resources of the Citarum River Basin is under controlled. However, the other three (3) river basins of Cibeet, Cikarang and Bekasi River have no control facilities except irrigation weirs. The increasing of flood runoff and necessary countermeasures are suggested.

The water resources in the area have been managed by Jasa Tilta Public Corporation as the Citarum Integrated basin (12,000 km²) together with the Directorate General of Water Resources, Ministry of Public Work and the West Java Governor.

(5) Regional Disaster Risk Reduction and Management Plans for Kab. Bekasi and Kab. Karawang are still under preparation stage. The industrial estates are not involved in the RDRRMP and it would be better for the Area BCP to consider the participation in the Regional Disaster Risk Reduction and Management Plan as communities.

3.3.2 Typoone/Hydrometrology

The pilot area is located in the Southern Hemisphere and off the typhoon route.

The floods in the pilot area are caused by storm rainfalls of monsoons and big floods are recorded in February 2002, February 2005, February 2007, March 2010 and January 2013.

3.3.3 Storm Surge

Storm surges generated by tropical cyclone have caused severe damage in the southern coast of Java, Indian Ocean side, but no storm surge in the northern coast of Java, the Java Sea side.

3.3.4 Earthquake

The Indo-Australia Plate is subducting under the Eurasia Plate and forms Sunda Trench to the south of Jawa island from east to west. This area is active in seismicity as well as Japan. However, the northern part of Jawa island where the pilot area is located is far from the seismic source area and for that reason less affected by the large earthquakes occurs along the Sunda Trench. Therefore, there

is no record of earthquake disaster with many casualties after the 20th century in and around Bekasi and Karawang region. There are two inland earthquakes caused a single fatality in 1975 and 2005 in the mountainous region of mid Jawa Barat. Also, an earthquake which caused 7 deaths occurred back in 19th century.

The Global Seismic Hazard Assessment Program (GSHAP) modeled seismic activity globally and conducted probabilistic seismic hazard analysis. The published peak ground acceleration (PGA) for the pilot area with a 10% probability of exceedence in 50 years (475 years in return period) is about 300 gal on the rock site. However, according to the geological map by PSG (Geological Survey Institute), some of the pilot area is covered by Quaternary soft sediment and it is expected to amplify the seismic motion around 50 % higher on the ground surface. On the other hand, when 100 years return period is adopted for BCP, smaller PGA would be expected. 120 - 150 gal (MMI 7 - 8) is expected by the analysis of the Study Team. This ground motion level is assumed to cause some damages or troubles to the facilities.



3.3.5 Tsunami

There is no record of tsunami which caused casualties in and around the pilot area by the disaster database. The earthquake which caused disastrous tsunami occurs off the south coast of Jawa island along the Sunda Trench, and for that reason tsunami height becomes much lower on the process of passing through Sunda strait to around Jakarta. The tsunami height around Jakarta, caused by the magnitude 9 earthquake along the Sunda Trench, is expected less than 0.5 m by the analysis of the Study Team.

3.3.6 Volcano

There are about 150 volcanoes in Indonesia and 80 of them are active volcanoes. Mt. Kiarabberes-Gegak, Mt. Salak, Mt. Gede and Mt. Tangkubanparahu are located within 100km of the pilot area.

Mt. Krakatau which erupted in 1883 on the second largest scale in Indonesian history is located about 170 km west to the pilot area. Mt. Merapi is located about 350 km east and Mt. Kelut is 570km east to the site. They erupted repeatedly in history and are still active in recent years. Mt. Galunggung which caused US\$ 160 million economic loss (0.12% of GDP) by the eruption in 1982 is located about 120 km southwest to the site.

The Center for Volcanology and Geological Hazard Mitigation (CVGHM) has developed 80 hazard maps of volcanoes. In the maps, the volcanic hazardous areas are classified into the following 3 categories, "Region I: Affected by secondary risk from eruption (lahars and ash clouds)", "Region II: Affected by material eruption by climatic condition" and "Region III: Directory affected by material eruption (pyroclastic flow, debris and gasses)"

The early warning system for volcanic eruption has been operated by the CVGHM. The warning levels for volcanic eruption are classified into the following 4 categories, "Level I: Normal Volcanic activity stays in normal without any difference from its background levels", "Level II: Alert Volcanic activity begins to increase and has passed over its background levels", "Level III: Stand by Volcanic activity has shown its precursor before eruption" and "Level IV: Danger Started with volcanic ash eruption, and then approaching the main eruption".



3.4 The Present State of Industrial Agglomerated Areas in Indonesia

The team visited Karawang International Industry City (KIIC), as one of the industrial parks in West Java Province. This is because KIIC was selected as the industrial park for simulation representing the others in the industrial Agglomerated Areas. The team selected the following industrial parks in West Java Province for the questionnaires survey:

- 1) Bekasi International Industrial Estate (BIIE)
- 2) East Jakarta Industrial Park (EJIP)
- 3) Greenland International Industrial Centre (GIIC)
- 4) Jababeka Industrial Park (JIP)
- 5) Lippo Cikarang Industrial Park (LPIP)
- 6) MM 2100 Industry Town (MMIT)
- 7) Marunda Industry Park (MIP)
- 8) Karawang International Industry City (KIIC)
- 9) Kujang Cikampek Industrial Estate (KCIE)
- 10) Mitra Karawang Industrial Park (MKIP)
- 11) Bukit Indah City Industrial Estate (BCIE)
- 12) Surya Cipta Industrial Estate (SCIE).

12 industrial parks are presented with black shade in the map issued by BIG^4 as shown in Figure 3.4.1.



Source: CRM, Local Consultant

Figure 3.4.1 Industrial Parks in the Industrial Agglomerated Areas in West Java Province

⁴ Bakosurtanal, a special government agency dealing with geospatial and maps

3.4.1 Industrial Parks in the Industrial Agglomerated Areas

In the field survey conducted in August 2013, JICA Team visited KIIC, as the model park, and MM2100 for interviews. This is because both two parks are developped by the major Japanese trading houses. The following are the sammary of thsoe industrial parks:

Karawang International Industrial City (KIIC)

KIIC is constructed in 1992 as a green modern industrial park located in west Karawang regency and it is a joint venture between Sinar Mas Land of Indonesia and ITOCHU Corporation Japan. It encompasses an area of 1,400 hectares. The number of tenants has reached 125 business enterprises including 102 Japanese affiliated companies (82%). ⁵

KIIC is the first industrial park in Indonesia to be granted ISO 9001/2000 certificate, ISO 14001/2004 for Quality & Environmental Management System in 2002 and certificate of OHSAS 18002/2007 for Health & Safety Management Systems



Source: http://www.itochu.co.jp/en/news/2012/121022.html

Figure 3.4.2 KIIC and Infrastructure

This year (2013), KIIC marks the 21st anniversary from its inception in 1992, and more than 80% of the customers are Japanese oriented companies due to a better quality of an parks management and administration for the past 20 years. Some large national and multinational corporations as tenants at KIIC such as Toyota Motor Manufacturing Indonesia, HM Sampoerna, Yamaha Motor Indonesia, Astra Daihatsu Motor, Panasonic Semiconductor Indonesia and Sharp Semiconductor Indonesia.

⁵ Source: <u>www.kiic.webs.com</u>

The master plan of KIIC development consists of the five phases in total. So far, the third was completed. According to the management of KIIC, the further development is to be implemented with the careful decision making with the careful business evaluation.

KIIC made a premium power purchase agreement with PLN, which secures the stable supply of power to the tenants in KIIC. This agreement is the first contract as the premium status in Indonesia. The land for transformer is provided by KIIC with free of charge, where PLN installed the transformers⁶ of PLN only for KIIC.

The frequent scheduled black-out was seen until 2008 because of the power shortage. As PLN invested for infrastructure improvement, the power demand supply balance for industrial parks is stably secured since 2009.

- 1) Even the black-out is planned, the power supply to KIIC is secured all the time because of the premium power purchase agreement with PLN.
- At the area developed in the third phase, there is additional transformers are installed outside KIIC site, which enables the power supply source to be dual together with the original transformers in KIIC site.
- 3) KIIC takes care until the connection stage. After that, the tenant companies should contract directly with PLN.
- 4) Voltage: 20kV (for 220V or 380V, each tenant company will have to install step-down transformers of their own to reduce the voltage.
- 5) Frequency: 50HZ
- 6) PLN Tariff system (over 201kVA))
 - Connection Fee: Rp. 430,000/kVA
 - Down Payment: Rp. 550,518/kVA (Deposit, Advance payment)
 - Basic Charge: Rp42,644/kVA (monthly charge)
 - Usage Charge: Rp. 1,121/kWh (flat rate)
- 7) Industrial Water: Intake from West Tarum Canal / In-house treatment by KIIC (30,000tons/day)
- 8) Telecommunication: PT. Telekom, 1,000 lines available
- 9) Natural Gas: Direct Contract with PGN

<u>MM2100 Industrial Town (MMIT)</u>

MM2100 Industrial Town established in 1990, is fully integrated industrial park developed by PT Megalopolis Manunggal Industrial Development (MMID), established by two well integrated corporation; Marubeni Corporation of Japan and Manunggal Group of Indonesia (owned by the Nin King). The three phases master plan was all completed by 1998.

MM2100 located in Cibitung, Bekasi regency, has 1,450 hectares of land. Part of the land (200 hectares) are developed and managed by PT Bekasi Fajar Industrial Estate, and 1,250 hectares by PT Megalopolis Manunggal Industrial Estate. MM2100 offers one stop service to secure investment

⁶ 180MW (60MW 3基)

license. It also has also adequate infrastructure like other industrial parks. As of September 2013, with 176 tenants (167 in operation) and 406 supporting companies, MM2100 Industrial Town is one of the best value industrial parks in Indonesia including 120 Japanese affiliated companies (68%). Total number of employee is around 13,350 workers.⁷ 35% of the tenants are the majority related to manufacturing both of automobiles and motorcycles.



Figure 3.4.3 MM2100

Electric power is supplied by IPP, PT. Cikarang Listrindo with stable source. No tenants prepare the back-up power generator, because the stable supply is secured by the IPP. Since the tariff of PLN increased, IPP is quite competitive. Neither MM2100 installs back-up systems, because power sales by MM2100 are not allowed by the regulation.

1) Charge and Tariff

Deposit: Calculation in 2 months billing

Connection Charge:

Fixed amount paid to IPP (PT. Cikarang Listrindo)

- ✓ Medium Voltage 1,600kVA~: US\$49,000 / 202kVA~1,600kVA: US\$35,000
- ✓ Low Voltage ~201kVA: Rp. 450,000 × kVA Variable Amount paid to MMID
- ✓ US $66 \times kVA$

<u>Tariff</u>

- ✓ Capacity Charge: Rp. 9,000/kVA × Exchange rate factor (Rp. To US\$)
- ✓ Usage Charge: Rp. 140 × Exchange rate factor (Rp. To US\$)

⁷ Source: <u>www.mm2100.co.id</u>

Electricity Tax⁸

2.4% × (Capacity Charge + Usage Charge)

- 2) Industrial Water is taken from West Tarum Canal. MM100 treats water by their own systems with the capacity of 42,000m³/day.
 - Connection Charge (Depend on the size of Water Pipe)
 - ✓ Size 1~1.5: US\$ 20,000
 - ✓ Size 1.5 : US\$40,000
 - ✓ Size 2~ : US\$60,000
- 3) Telecommunication is ready 3,000 lines by PT. Telekom
- 4) Natural Gas is supplied by the direct contract with PGN.

3.4.2 A Japanese Chemical Products Manufacture in KIIC

KIIC introduced a Japanese chemical manufacturer for interview, which focused on the previous experience of natural hazard, lifeline utility and traffic infrastructure in disasters. The factory commenced the operation in September 1998. The main products are silicon wafer.

There were two earthquakes during 16 years since the commissioning of the factory. The president of the company worries more about smoke from burning off the fields and volcanic ash than usual natural disaster. This is because such smoke and/or ash may deteriorate the production quality. There is a couple of flood annually, which prevents the commutation of the employees. The numbers of the employees who fail to come to the factory is only 10%, which does not harm the daily manufacturing. The company is not concerned the disaster risk by floods because of the higher⁹ level of the land.

1) Business Continuity Plan

Every three months, the company reports the business risk analysis to the head quarter in Japan as one of the measures of Business Continuity Plan.

2) Inventory Control

The issues on inventory control are sorted out by the three months' stock of products. The same products If the shortage

3) Lifeline Utility

Before 2008, there were a lot of power failure because of the gap between demand and supply of the electricity. Since 2009, the electricity supply to industrial parks has been stable because of the improvement of the infrastructure.

4) Traffic Infrastructure

The company complains about the insufficient infrastructure. For the moment, there is only one high way, i.e. Jakarta-Cikampek Toll road. Continuous traffic jams are the major issues for the daily business.

⁸ Refer to Local Government (Bekasi Regency) Regulation No.1 Year 2011

⁹ 40m above sea level

3.5 Situation of Infrastructure

3.5.1 Road

(1) Outline

Object roads are mainly the roads in the Special Capital District of Jakarta (DKI Jakarta), Bekasi City, Bekasi Regency, and Karawang Regency —the last 3 Areas are in the West Java Province.

These are the area of the capital and the primary important industrial agglomerated area, and the important road to which they are connected is the Jakarta to Cikampek Highway (toll road) from Jakarta to Cikampek.

This road connects the highway from Cikampek to Bandung, and has become a trunk road to connect Jakarta, industrial agglomerated areas and Bandung.

However, the chronic traffic congestion is caused by the heavy traffic concentration to Jakarta with the increase in the traffic demands, freight transportation and commuters in recent years.



The congestion Between the Jakarta and Bekasi is especially remarkable.

Figure 3.5.1 Traffic Environment around Industrial Agglomerated Area

Rapid increase in the population of the DKI Jakarta and Bekasi areas is seen, and it has become one of the causes of traffic congestion of a highway.

It can be said that the traffic congestion has been caused by the increase in traffic due to the industrial estates and in population, and the both became entangled.

Area	Population ('000)				Area	Population	
				(km2)	Density		
	1980	1990	2000	2010	2010	(2010)	
						(People 🖌	
DKI Jakarta	6,503	8,210	8,364	9,588	663	14,470	
Bekasi Area	1,143	2,073	3,200	5,021	1,480	3,393	

Table 3.5.1Population and Its Density Around the Highway

Source : Population Census of Indonesia



Source: The Ministry of Economy, Trade and Industry, the 2nd Jakarta-Cikampek Highway Feasibility Study Report of Indonesia 2013.2

The National Route 1 (Trans Jakarta) which is a part of Asian Highway serves as a trunk road of the highway from Jakarta which passes along the northern Java on the north side of the Cikampek Highway, and main cities were connected and it has played the auxiliary role of the Cikampek Highway. In industrial agglomerated areas, regency roads in the direction of north to south are seen. These roads and Kabupaten roads consist of important community road networks as local resident's traffic.

(2) Disaster Example

The direct damages caused by flood have arisen on neither industrial agglomerated areas nor the highway itself. However, in the highway of 72 km long, inundation by the shortage of drainage

capacities of the rivers of both sides of the highway have often occurred in the residential areas at 14 km, 19 km and the 41-km points, and the highway serves as the refuge place.

There is also that, traffic between Bekasi and Jakarta falls into excessive traffic congestion, and especially at the time of flood it causes paralysis.

On the north side of the highway, the altitudes of almost all areas are low, and this area is a flood prone area, thereby paralysis of traffic arises frequently.

(3) Commuting Means

Although accompanying by the bus or van is performed in industrial estates, general commuting is done with mass transit (a bus, a station wagon bus, etc.).

Urban Area	Commuter	's Means of Transportation		
	Omnibus means of	Individual means of	On foot	
	transportation (Mass	transport		
	Transit)	(passenger car,		
		motorbike, etc.)		
Jakarta City East	55.4	39.3	5.4	
Bekasi City	57.9	38.5	3.6	
Depok City	58.4	34.6	7.0	
Bandung Regacy	48.6	31.4	20.0	
Bogor Regacy	82.5	14.1	3.4	

Table 3.5.2 Commuter's Means of Transportation

Source: Profil Komuter, 2005 Badan Pusat Statistik

(4) Road in physical distribution

The physical distribution from industrial agglomerated areas has arisen fundamentally between the there and Tanjung Priok Port in Jakarta, and the Cikampek Highway has intense passing of trucks.

However the physical distribution from industrial agglomerated areas to the port is done in one-day round-trip because of traffic congestion. It is in far situation from efficiency of physical distribution. JASA MARGA which manages the highway is pay efforts to strengthen the surveillance system, aiming to find defects and remove problems within 30 minutes.

3.5.2 Port

(1) Outline

The Tanjung Priok Port located in the northeast of Jakarta is located at the center of not only the Jakarta metropolitan area but the greatest industry, commerce, and consumer place belt in Indonesia of whole Java Barat, and is an international industrial port as a base of the shipping physical distribution of Indonesia.

The port has the area of mooring region 422 ha and land region 630 ha, crosses it to 6 km of east and west, and consists of five ports, three container terminals, and five berths.

Extension of a berth is 18,185 m. Also there are 18,914 ship calls in 2011 and records 5,649,119 TEU and the port is an important international port in ASEAN where an annual pace of expansion records 26% of an annual average.



Legend : ①Terminal I、②③Terminal II、④Terminal III、⑤⑥JICT(Jakarta International Container Terminal) ⑦ Koja Terminal ⑧TPT (Tnajung Priok Car Terminal)

Figure. 3.5.3		Tanjung Priok Port
Table 3.5.3	Cont	ainer Cargo Throughput

Terminal	2007	2008	2009	2010	2011
Jakarta International	1,821,292	1,995,781	1,675,395	2,095,008	2,265,202
Container Terminal					
Koja Container	702,861	704,618	620,172	754,592	839,245
Terminal					
Conventional	1,165,630	1,283,879	1,509,338	1,762,912	2,544,672
Total (TEUs)	3,689,783	3,984,278	3,804,905	4,612,512	5,649,119

Source : Statistical Yearbook of Indonesia

There are two bay entrances: the east and west, and only the west side of 14 m deep are usually being used.

Off the harbor, the reclaimed land of 72 ha is extended, the port extension development project (the north Calibaru development project) which builds the quay of 1,200 m is undertaken, and shortage of harbor facilities is scheduled to be canceled with the demand which increases rapidly.

Although carrying-in and taking out of the containers in the port is fundamentally performed by the trucks, the railroad is also used to the limit, and the vehicles of 26 vessels unit are making a round trip of 12 times a day.

(2) Issue

The major issues for the port are as follows:

- 1) The port facilities are becoming difficult to match to the increase in container transaction volume.
- 2) A new elevated road (JOOR: Jakarta Outer Ring Road) from Tanjung Priok Port to the industrial agglomerated areas is under construction. However, even if it is made, it is not solving the present traffic congestion, and the road on the sea which newly connects Marunda is planned.
- 3) The IPC (Indonesia Port Corporation) which manages the Tanjung Priok Port, has not have a disaster prevention plan because the port is fundamentally not subject to the influence of floods and no damage record of earthquake, tsunami, etc

3.5.3 Railway

The Java Trunk Line is running to the north side of the industrial agglomerated areas from the east to the west. It is a single and not electrified yet. However, the amount of transportation by rail and the numbers of trains connecting between cities are increasing, and the facilities have been reached to the limit of the capacity in recent years.

Especially the track of Bekasi line (between Manggarai station and Bekasi station) is sharing with the long-distance line and the commuter, and the Bekasi line has many grade crossings, it has become the trouble on operation management.

Moreover, at the Cikarang station on the north side of the center of industrial agglomerated areas, only about five trains depart and arrive per day, therefore the capability of the transport capacity of the Java arterial railway also seem in a low state.



The increase of the railroad users at the JABODETABEK area is also supposed to have stopped.

JABODETABEK area : Jakarta, its circumference 4 city and three areas Source : JBIC, Indonesia Investment Environment 2012

Figure 3.5.4 Transition of the Number of Railroad Users

For this reason, building four-track lines of the Java arterial railway and feeder traffic as new transportation system to the MM2100 industrial complex, etc. are considered, and the improvement of the service level of commuting transportation is called for.

3.5.4 Airport

(1) Outline

In the Jakarta Metropolitan area, there are 4 airports now: Soekarno Hatta International Airport, Halim Perdanakusuma Airport, Pondoc Cabe Airport, and Chrug Airport, and it is playing each role.

Soekarno Hatta International Airport is located at about 20 km west of Jakarta. It started operation at 1985, and is mainly aiming at the international flight.

The passenger traffic in 2012 was 58 million people, which increase 12.1 % more than 2011.

The capacity of the airport is not able to respond to the rapid increase of users. It has become the 9th busiest airport in the world. Currently the airport is using three terminals and has a plan to add one more terminal.

- 1) The terminal only for domestic flights,
- 2) Terminal for international flights and for P.T. Garuda Indonesia
- 3) The terminal only for LCC

As others, there is a terminal for cargos and for Hajj.

The numbers of runways are two and they are 3,660 m x 60 m, respectively.

The area of the apron is 830,142 m², The area of the passenger terminal: 338,728 m²and the cargo facility: 70,794 m². The handling cargo volume in 2012 is 342,473 metric-tons.



Source : The Ministry of Economy, Trade and Industry, Indonesia Soekarno Hatta International Airport Extension Project Study Report 2012.2

Soekarno Hatta International Airport

Year	Passenger	Air Cargo	Number of airplane
		(tons)	arrival and departure
2008	32,172,114	465,799	245,482
2009	37,143,719	538,314	287,868
2010	44,355,998	633,391	338,711
2011	52,446,618	617,716	345,495
2012	57,772,762	342,473	369,740

 Table 3.5.4
 Use Situation of Soekarno Hatta International Airport

Figure 3.5.5

Source : Wikipedia, Soekarno-Hatta International Airport

Since the traffic infrastructure which goes to this airport from the inside of Jakarta does not have a railway, it has only access by a car or bus, confusion is daily occurrence every, and it has spoiled the convenience of the airport.

Moreover, the part where banking is made is located at the bad place of the foundation, it becomes a cause of the flood of the rainy season, and this has also obstructed traffic.

Moreover, the BCP correspondence to electric power equipment is not made, and stable employment of the air traffic control system is not made

Halim Perdanakusuma Airport is located 11 km east from the Jakarta central part, and access from the industrial agglomerated areas in the east and the Jakarta central part is convenient.

Although the arrival and departure of VIP chartered flights and warplanes are mainly treated, it is taking charge also of transportation of the precision component and product from the industrial agglomerated areas. However, regular air services have been restricted for non-commercial flights, and the numbers of uses are decreasing.

Year	Passenger	Air Cargo	Number of airplane
		(tons)	arrival and departure
2011	69,499	531,139	5,281
2012	42,094	259,512	5,484

 Table 3.5.5
 Use Situation of Halim Perdanakusuma Airport

Source: PT Angkasa Pura II

Since the airport was a former international airport, so a runaway of 3,000 m x 45 m is sufficient for a domestic flight. Five airlines use it now.

About other two airports, there are problems in access, and it does not include in this report.

3.6 Situation of Public Services

3.6.1 Electricity

(1) Outline

National Perusahaan Listrik Negara (PLN) is carrying out power generation and power transmission enterprise. This Bekasi and Karawang branch offices are in charge to supply the electric power to the region. The electric power which the Province of Java Barat is bearing is as follows.

Although small-scale thermal power plants are located in the Province of Java Barat, most electric power is generated and provided by the other provinces.

Year	Installed	Produced	Sold Electrocity
	Capacity	Electricity	(000 MWh)
	(MW)	(000 MWh)	
2007	1	14	32,337
2008	1	49	34,051
2009	1	40	35,701
2010	1	96	38,671
2011	1	34	41,328

 Table 3.6.1
 Electricity in West Java Province

Source : Statistics-Indonesia, Statistical Yearbook of Indonesia 2012

There are various kinds of power generation equipment means. As a means, there are many coalfired thermal power stations and combined cycles and followed by hydro-power generation.

Item	Product Means	2010 (GWh)
PNL Generation	Hydro	15,827.35
Facility	Coal-fired	54,407.02
	Gas Turbine	7,861.70
	Combined Cycle	26,811.70
	Geo thermal	3,398.02
	Diesel	5,096.98
	Diesel Gas	73.56
	Sunlight	0.50
	Wind	0.02
Rental		8,233.21
Sum		131,710.07
Purchase		38,076.16
Total		169,786.23
Comparison with		7.39%
the previous year		

Table 3.6.2Production of Electricity of PLN



Source : PLN, PLN Statistics 2010

Figure 3.6.1 Power Grid

(2) Electric Power in Industrial Estates

In the industrial estates, since the priority contract of supply is signed with PLN, serious electric power shortage has not arisen. Therefore, per year, the frequency of power failure is limited to about several times, and that of power failure time is short.

(3) Power Failure of Residential Area

Although the power failure of residential area has generated by remarkable frequency at every flood, War Room at each branch office is to correspond immediately and to restore the power within one day.

3.6.2 Water

(1) Water Supply

The tap water of the Bekasi city, the Bekasi Regacy, and the Karawang Regacy is from the Citarum River which flows from Jatiluhur Dam, and intake water from WTC (West Tarum Canal), where water flows from east to west.



Source : JICA MPA Study Team



The demand of the water in Bekasi City, / Regacy and Karawang Regacy is as follows.

Table 3.6.3 Water Demand 2010

Item	Bekasi	Karawang
	City/Regacy	Regacy
Population	4,966,040	2,125,234
Water Supply Population	1,087,772	369,216
Water Supply Diffusion Rate	21.9	17.4
Water Supply per Capita	125	78
Basic Demand	136,486	28,673
Rate of Non-revenue Water	18.5	39
(NRW %)		
-----------------------	---------	--------
Water Demand (m3/day)	167,447	47,018
Water Demand (l/s)	1,938	544
Special Demand (l/s)	0	0
Total Demand (l/s)	1,938	544

Source : MPA Study 2012.11

(2) Industrial Water

The present condition of industrial water and the demand in 2020 are shown below.

Area	2010	Increment (20	2020	
	Present Use	Area of Industrial	Water Demand	Water
	(l/s)	Estates	(l/s)	Demand(l/s)
		(ha)		
Bekasi	2,242	3,370	1,348	3,590
Karawang	3,630	620	248	3,878
Total	5,872	3,990	1,596	7,468

Table 3.6.4Demand of Industrial Water

Note : Unit Increase Water Demand : 35m3/day/ha = 0.4 l/s Source : MPA Study Team

In terms of water demand for domestic use and industrial use, a steep increase of the both will be expected from now on.

Area	Item	2010	2020
		Present Use	Water Demand
		(m3/s)	(m3/s)
Bekasi	PDAM	1.9	6.0
	Industrial Use	2.2	3.6
	Sub Total	4.2	9.6
Karawang	PDAM	0.5	2.4
	Industrial use	3.6	3.9
	Sub Total	4.2	6.2
Total		8.4	15.8

Table 3.6.5Future Water Demand

Source : MPA Study Team



Source : JICA MPA Study Team

MPA: Master Plan for establishing Metropolitan Priority Area for Investment and Industry in Jabodetabek Area-Final Report

Figure 3.6.3 Future Water Demand

(3) Sewerage

There is no sewer system in Bekasi City, Bekasi Regency, and Karawang. The sewage treatment depends on the septic tanks.

3.6.3 Communication

(1) Internet Broadband Market

204 companies acquired Internet access service related licenses as of 2011.

Moreover, broadband subscribers have recorded 2,740,000 people and have a tendency to increase every year.

 Table 3.6.6
 Subscribers and Diffusion Rate in National Broadband Service

Year	2007	2008	2009	2010	2011
Number of Broadband Subscribers	779	982	1,864	2,280	2,736
(`000)					
Diffusion Rate of Broadband %	0.3	0.4	.08	1.0	1.1

Source : ITU-World Telecommunication/ICT Indicators Database 2012

(2) Mobile Phone Market

The main cellular phone business operators are Telkomsel, Indosat, XL Axiata, etc.

This market shows a rapid growth and has one-person the diffusion rate of one set.

Year	2007	2008	2009	2010	2011
Number of Mobile Phone	93,387	140,578	163,677	211,290	236,799
Subscribers ('000)					
Diffusion Rate of Mobile Phone %	40.2	59.8	68.9	88.1	97.7

 Table 3.6.7
 Subscribers and Diffusion Rate in National Mobile Phone Service

Source: ITU-World Telecommunication/ICT Indicators Database 2012

(3) Fixed-line Phone Market

Six (6) entrepreneurs provide the local telephone services. One satellite is held and the satellite communications services are provided.

 Table 3.6.8
 Subscribers and Diffusion Rate in National Fixed-line Telephone Service

Year	2007	2008	2009	2010	2011
Number of Fixed-line Telephone	19,530	30,378	34,807	40,929	38,617
Subscribers ('000)					
Diffusion Rate of Fixed-line	8.4	12.9	14.7	17.1	15.9
Telephone %					

Source : ITU-World Telecommunication/ICT Indicators Database 2012

(4) Radio Market

There are RRI of public broadcasting, commercial broadcasting, university broadcast, army broadcast, and community broadcasting, and there is a broadcasting station of about 800 agencies in the whole country.

(5) Broadcast Market

After TVRI starts broadcast in 1962, commercial broadcasting began from 1989 and 11 entrepreneurs are performing broader-based broadcast.

The satellite broadcasting Indovision has started broadcast in 1994, and about 650,000 people have joined now.

Although two companies are leading cable TV, the subscribers have hung low in about 160,000, and can view and listen only in the Jakarta metropolitan area in the project region. The government aims at shifting to digital broadcasting completely in 2018

3.6.4 Gas

There is no town gas system in Bekasi city and Bekasi Regency, and Karawang Regency.

The heat source for cooking of the area is propane to which most uses butane propane as the main ingredients.

0.5 kg of propane is equivalent to 1 liter of kerosen, and it is the cost of the half of kerosene and has become a widely diffused cause. However, the accidents by a gas leak are occurring frequently.



The distribution network to a gas store is shown below. There is an all the 26 places store.

Figure 3.6.4 Gas Distribution to Depot (Customer)

3.6.5 Waste

(1) Outline

In the West Java Province, abandonment disposal is carried out at about 40 landfill disposal sites in which about 4,500 tons/day city garbage is not classified but in a state as mixed garbage.

However, loss in quantity of the generating garbage by 3R program is promoted, and a plan to compost 20% of generating garbage is formulated.

(2) Final Disposal Site

The amount of generated garbage and the landfill disposal sites in the pilot area are shown below.

City / Regency	Bekasi Regency	Bekasi City	Karawang	Total
			Regency	
Generation	1,686	4,307	1,299	7,292
(m3/day)				

Table 3.6.9Final Disposal Site

Final Disposal Site	Burangkeng	Bantar Gebang	Jalupang	
	Setu	Sumur Batu		
Amount Landfill	900	5,000 tons	230	
Garbage (m3/day)		1,392		
TPA Area (ha)	7.60	108.00	3.50	
		10.00		
Start	1994	1989	2002	
		2003		
Operation Condition	Controlled	C.L.	Open dumping	
	landfill	C.L.		

Source : Ministry of Environment, Indonesia Waste Treatment Program CDM Business Study in West Java Province 2008



Figure 3.6.5 Map of Final Disposal Sites

(3) Composition of Garbage

At two dumping sites in Bandung, extraction of the garbage samples were extracted in November 2008, and the following results were found as follows.

No.	Garbage	Composition
		(%)
1	Organic	56
2	Wood/Branch	1
3	Egg bale	1
4	Paper	15
5	Cloths	2
6	Rubber	2
7	Bone	1
8	Glass	2
9	Plastic (bottle)	2
10	Plastic (sheet)	15
11	Metals	0
12	Residues	2

Table 3.6.10 Composition of Garbage in Bandung City

Source : Ministry of Environment, Indonesia Waste Treatment Program CDM Business Study in West Java Province 2008

3.6.6 School

The numbers of schools concerned are as follows.

City / Regency	Kab.	Bekasi	Kota. Bekasi		Kab. Karawang		Total
	Public	Private	Public	Private	Public	Private	
Kindergarten Schools	2	664	716	-	1	105-	1,488
Primary Schools	702	391	753	174	848	158	3,026
Junior High Schools	109	247	39	170	82	93	740
High Schools	37	92	18	75	24	70	316
University/Colle		6		8	1	0	24
0-							

Source: Hearing Study by Local Consultant

3.6.7 Hospital

The numbers of hospitals concerned are as follows.

City / Regency	Kab. Bekasi	Kota. Bekasi	Kab. Karawang	Total
Number of Beds				
More than 200	0	2	1	3
More than100	4	10	5	19
100 or less	7	9	8	24
Unknown	0	6	0	6
Total	11	27	14	52

Table 3.6.12Number of Hospitals

Source: Hearing Study by Local Consultant



Figure 3.6.6 Map of Hospitals and Commercial Centers

3.7 Economic Relations with Neighboring Regions and Economic Ties with Japan

3.7.1 Overview of the Economy of Pilot Area

Areas along the highway running through Bekasi city, Bekasi regency and Karawang regency are regarded as a major base for Japanese companies to expand their business. The speed of economic development of Karawang regency is regarded the fastest in Indonesia. Many workers in the area commute from Jakarta, and it is contributing to the emergence of Jakarta metropolitan area (JABODETABEK : an acronym for Jakarta, Bogor, Depok, Tangerang and Bekasi).

As major industries in the region, Machinery, Agro, Textile, and Electronic can be identified. For example, according to the statistic data of Karawang Prefecture, the total number of employee shows 133,558 in 2010. Breaking down by sector, "Machinery (22,146)" is on the top, following Agro (21,223), Textile (16,077), and Electronic (12,687).

Owing to the benefits of this economic development, the minimum wage of Jakarta has increased 44% from the previous year, and has reached the level of twenty and several thousand yen per month. Cost of fuel added is also contributing to the continuing rise of labor costs and is becoming a great burden on the labor intensive industry. Therefore, it is expected that some companies may consider moving to rural areas in the future. Nevertheless, it is believed to be difficult to move to other areas immediately under current circumstances, since the infrastructure development in Jakarta area is much more developed compared to other areas, and especially, because Japanese companies are concentrated in this area (East Jakarta).

According to the latest statistic data "Statistical Yearbook Indonesia 2012", the regional GDP of West Java province is IDR 861 trillion (as of 2011), representing 11.6% of Indonesia's national GDP and the third largest regional GDP, behind Special Capital Territory of Jakarta (ranking first with 13.2%), and East Java province (ranking second with 11.9%). Also, the GDP growth rate of West Java province was 6.48%, and while it is still behind Special Capital Territory of Jakarta which marked a growth rate of 6.71%, it is higher than the national average of 6.32% and it surpassed the growth rate of East Java province which marked 5.16%.

3.7.2 Major Economic Policy

In order to promote foreign investment, the government of Indonesia offers three major economic incentives: (i) grant of tax holidays (given only to a limited number of industrial sectors including pioneer industries), (ii) grant of tax allowance (given to a wider range of industrial sectors), (iii) import duty exemptions in bonded area (corresponds to export processing zone). Currently, Japan, Singapore and South Korea are said to be enthusiastic in investing in Indonesia. Japan and South Korea have strong manufacturers in sectors such as automobile industry and Singapore is particularly interested in investing in service and commercial sectors.

In May 2011, the government of Indonesia formulated "The Masterplan for Acceleration and Expansion of Indonesia's Economic Development (MP3EI)" as a specific measure to solve the problem of infrastructure development. Under the plan, economic development is promoted by dividing Indonesia into six economic corridors and placing emphasis on the key industries identified for each region. The country targets to increase its nominal GDP six times the level of year 2010, and to become one of the world's top ten economy by year 2025.

"Master Plan for Establishing Jakarta Metropolitan Priority Area for Investment and Industry (MPA)" announced in October 2012, was developed jointly by the governments of Japan and Indonesia. The plan proposes a set of measures including development of the new Cilamaya International Airport and improvement of road access (to Bekasi-Karawang area). If these improvements to the

infrastructure are made, it will contribute to the alleviation of traffic congestion in Bekasi and Karawang area and of over concentration of Tanjung Priok port.

Also, Jakarta is located on the junction point between Java Economic Corridor and Sumatra Economic Corridor. Therefore, if MPA is successfully established, it is expected to contribute to the economic development of Indonesia through MP3EI as well. Especially, companies in Bekasi-Karawang area have large expectations, and the result of hearings held in the field survey showed that both administrative officers and private sector in Karawang place high expectations on the realization of the plan for MPA.

However, the plan is currently stalled due to issues such as land expropriations. Similarly, no progress is being made toward actual construction of new airport in Karawang area (in addition to Scarno Hatta Airport) and the second Jakarta-Cikampek highway, for which plans have already been approved.



Figure 3.7.1 Network Hub of Economic Development Corridors between Java and Sumatera

3.7.3 Economic Ties with Japan

Looking at the trade value between Japan and Indonesia, the export value to Japan reached 33,715million USD (based on FOB price: 2011) which made Japan the largest export destination. This is followed by China with 22,941 million USD, and USA with 16,459 million USD. As for commodities exported from Indonesia to Japan, mineral fuels consist most of the export items, and items such as raw materials not suitable for food (mineral resources), products classified by materials (e.g. wood products, metal products), and machinery and transport equipment also account for a substantial portion.

The import value from Japan was 19,437 million USD (based on CIF price: 2011), which made Japan the third largest exporter to Indonesia after China with 26,212 million USD, and Singapore with

25,965 million USD. Examining the commodities imported by Indonesia from Japan, primary products including fossil fuel and mineral resources, wood and seafood used to be the main item until 1990s. However, the proportion of industrial products such as machinery/electronic products and their parts are increasing since 2000s.

Japanese foreign direct investment (FDI) in Indonesia amounts to 1,516 million USD (2011) and is the second largest after Singapore with 5,123 million USD. While Singapore's FDI in Indonesia is mostly in the following three sectors, namely, manufacturing, wholesale/retail, and financial sector, Japanese FDI in Indonesia is characterized by its concentration in the manufacturing sector.



	2009	2010	2011
Japan	679	713	1,516
United States	172	931	1,488
Europe	2,109	2,918	2,697
Singapore	4,341	5,006	5,123
China (w/Taiwan)	32	48	243
Rest of the world	3,483	6,600	8,407
Total	10,815	16,215	19,475

Source: Statistical Yearbook of Indonesia 2012

Figure 3.7.2 Foreign Direct Investment Realization by Country (million US\$), 2009–2011

Foreign Direct Investment Realization by Location in Indonesia is shown below. FDI to the Java region amounts for 56% in the total. Among them, FDI to West Jawa Province and DKI-Jakarta amounts for more than one third in the total.

Lokasi			2012			
		Project	Value US\$1000	%		
Sumatera	Aceh	26	172,272.8	0.7%		
	Sumatera Utara	133	645,321.8	2.6%		
	Sumatera Barat	45	75,020.2	0.3%		
	Riau	81	1,152,854.9	4.7%		
	Jambi	30	156,321.8	0.6%		
	Sumatera Selatan	107	786,448.5	3.2%		
	Bengkulu	21	30,431	0.1%		
	Lampung	57	114,320.3	0.5%		
	Kepulauan Bangka Belitung	30	59,183.4	0.2%		
	Kepulauan Riau	165	537,110.7	2.2%		
	Total(Provinsi)	695	3,729,285.4	15.2%		
Jawa	Daerah Khusus Ibukota Jakarta	1,148	4,107,720.8	16.7%		
	Jawa Barat	682	4,210,703.8	17.1%		
	Jawa Tengah	141	241,512.6	1.0%		
	Daerah Istimewa Yogyakarta	28	84,939.2	0.3%		
	Jawa Timur	403	2,298,776.2	9.4%		
	Banten	405	2,716,263.7	11.1%		
	Total(Provinsi)	2,807	13,659,916.3	55.6%		
Bali dan	Bali	324	482,037.8	2.0%		
Nusa	Nusa Tenggara Barat	133	635,790	2.6%		
Tenggara	Nusa Tenggara Timur	20	8,723.7	0.0%		
	Total(Provinsi)	477	1,126,551.5	4.6%		
Kalimantan	Kalimantan Barat	45	397,534.8	1.6%		
	Kalimantan Tengah	89	524,738	2.1%		
	Kalimantan Selatan	54	272,291.3	1.1%		
	Kalimantan Timur	167	2,014,085	8.2%		
	Total(Provinsi)	355	3,208,649.1	13.1%		
Sulawesi	Sulawesi Utara	70	46,651.9	0.2%		
	Sulawesi Tengah	27	806,531	3.3%		
	Sulawesi Selatan	29	582,579.2	2.4%		
	Sulawesi Tenggara	41	35,723.2	0.1%		
	Gorontalo	17	35,314.6	0.1%		
	Sulawesi Barat	3	228.5	0.0%		
	Total(Provinsi)	187	1,507,028.4	6.1%		
Maluku	Maluku	10	8,518.1	0.0%		
	Maluku Utara	9	90,253.7	0.4%		
	Total(Provinsi)	19	98,771.8	0.4%		
Papua	Papua Barat	18	32,035.1	0.1%		
	Рариа	21	1,202,432.6	4.9%		
	Total(Provinsi)	39	1,234,467.7	5.0%		
Total(Wilaya	h)	4,579	24,564,670.2	100%		

Table 3.7.1	Foreign Direc	t Investment	Realization	by	Location
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Source: BKPM (Investment Coordinating Board)

Next, Foreign Direct Investment Realization by Sector in Indonesia is shown below. The primary industry amounts for 22.1%, the secondary industry amounts for 54.1%, and the tertiary industry amounts for 23.8%. FDI to the secondary holds a majority and among them "Food industry" (12.1%), "Nonmetallic mineral industry" (11.6%) and "Metal, machinery & electronic industry" (7.8%) shares a large portion of the total FDI.

Sektor		2012			
		Project	Value Rp. Million	%	
Primary	Food Crops & Plantation	180	9,631,484.3	10.4%	
	Livestock	31	97,444.7	0.1%	
	Forestry	9	144,542.2	0.2%	
	Fishery	7	14,729.3	0.0%	
	Mining	39	10,480,900.3	11.4%	
	Total(Sektor)	266	20,369,100.8	22.1%	
Secondary	Food industry	222	11,166,685.3	12.1%	
	Textile industry	51	4,450,911.0	4.8%	
	Leather goods & footwear industry	9	76,678.5	0.1%	
	Wood industry	15	56,968.1	0.1%	
	Paper and printing industry	64	7,561,039.0	8.2%	
	Chemical and pharmaceutical industry	94	5,069,454.8	5.5%	
	Rubber and plastic industry	110	2,855,009.6	3.1%	
	Nonmetallic mineral industry	37	10,730,662.3	11.6%	
	Metal, machinery & electronic industry	81	7,225,667.2	7.8%	
	Medical preci. & optical instru, watches & clock industry			0.0%	
	Motor vehicles & other transport equip. industry	21	664,417.7	0.7%	
	Other industry	10	31,450.8	0.0%	
	Total(Sektor)	714	49,888,944.3	54.1%	
Tertiary	Electricity, gas & water supply	42	3,796,780.1	4.1%	
	Construction	17	4,586,618.3	5.0%	
	Trade & repair	35	1,030,439.9	1.1%	
	Hotel & restaurant	34	1,015,033.6	1.1%	
	Transport, storage & communication	33	8,612,042.0	9.3%	
	Real estate, industrial estate & business activities	6	58,004.8	0.1%	
	Other services	63	2,825,050.6	3.1%	
	Total(Sektor)	230	21,923,969.3	23.8%	
Total(Sektor	Utama)	1,210	92,182,014.4	100%	

 Table 3.7.2 Foreign Direct Investment Realization by Sector

Source: BKPM (Investment Coordinating Board)

3.8 Situation of Implementation of BCP in Indonesia

3.8.1 Major Natural Disaster and Awareness of Disaster Management

Earthquake, volcanic disaster, flood, storm are regarded as an expected natural disasters which should be prepared in Java, Indonesia. Although risk management for theses natural disasters have been already considered in a private enterprises and civil organizations, Disaster Management have not been well prepared yet. Moreover, especially for BCP, most business people don't know well much about the concept, and the necessity of BCP for Corporate Disaster Risk Management have not either recognized commonly.

By the private institute such as the Chamber of Commerce and Industry (KADIN), an enterprise is seemed to put the more weight on the effort for developing the business activities than the management of disaster risk reduction, and most SMEs in Indonesia have little concerns against the corporate disaster risk.

3.8.2 Implementation of BCP

(1) Implementation of BCP in Enterprises

Enterprises are required to prepare risk management structures of natural disaster in accordance with the plans and strategies for national disaster management established by central government. Since the central committee for Occupational Health and Safety also established, the improvement of safe situation in an enterprise is considered. According to these schemes, enterprises have conducted their disaster risk management, however, little enterprises and organizations have already developed Disaster Management Plan or Emergency Response Plan.

Actions for corporate disaster risk management have not been implemented well, due to the low risk awareness of disaster because there is less experience of extensive corporate damage caused by the natural disaster in Jakarta and around.

Some enterprises which rely their business on road networks such as logistic company or which have the influence BCP in other companies have prepared the disaster preparedness plan or contingency plan.

(2) Implementation of BCP in Utility Supplier and Distributor

Private or public companies dealing with any hazardous material such as oil or gas are obligated by laws of public safety or environmental conservation to establish the risk management system of environment or crisis. And the implementation of disaster risk management should be advanced among general enterprises.

Electric utility companies are also required to prepare the crisis management. They develop the Standard Operating Procedure for operation. Although responses in emergency are also defined in this procedure, the plans of disaster management or contingency have not established. Furthermore, in water utility agencies, any well-structured disaster risk management has not been conducted in the present circumstances.

In other utility companies or agencies such as water resource, telecommunication, road network and else, we could not found an instance of developed BCP. Most companies have even not established any plans or manuals such as a contingency plan or a disaster recovery plan, and they have not considered about the risk of large-scale disaster.

(3) Implementation of BCP in Foreign Capital Companies and Japanese Companies

Some major manufacturers or commercial firms in foreign capital companies are inferred to prepare their BCP. In an industrial park which main factories of foreign capital companies are located, since water distribution systems and electric transmission systems are basically independent from surrounding area, the utility redundancy is ensured. In addition, some individual companies or industrial parks have the electric power facility for emergency. The preparedness of utility is established.

Enterprises consider a labor demonstration, accidents, traffic congestion and others as a considerable business risk more than a natural disaster risk. Because foreign capital companies also commonly devote their resources to these problems, it is seemed that to implement management of disaster risk has the relatively low priority.

3.8.3 Effort for Implementation of BCP

(1) Regulations or Guidelines for Implementation of BCP

National strategy for disaster risk management and action plan are developed and enterprises are also required to implement their risk management along with these strategies and master plans which developed in regions.

In central and local level, the governmental authorities related to disaster risk management such as National Disaster Management Agency (BNPB) and Regional Disaster Management Agency (BPBD) are in charge of establishment and coordination of disaster management scheme. However, in the present circumstance, any laws regulating enterprises to develop the disaster management plan have not established. The implementation of contingency plan or BCP are not quite advanced enough in neither of private nor government-owned enterprises.

(2) Effort for Diffusion and edification of BCP by Private Sector

Any efforts for implementation of BCP among enterprises attempted by a private sector are determined. For the efforts for improving corporate management of disaster risk, any active actions for supporting enterprises to establish disaster risk management or to conduct disaster risk assessment have not been verified.

However KADIN has a function to support business growth in SMEs and they take place a business seminar or symposium on a regular schedule, the issues of business continuity or disaster management have never dealt with as a main agenda. KADIN also consider that the implementation of BCP will be taken more interest in the near future.

3.8.4 Problem of Implementation of BCP

To implement the BCP, improvement of utility infrastructure is highly required. The insufficiency of constructing infrastructure in Indonesia is one of the problems for BCP diffusion. Since a road network is seemed a main bottleneck, the continuous traffic congestion around Jakarta causes severe influence on logistics. In addition, improvement of infrastructures of roads and drain facilities are urgent tasks, due to the flood vulnerability. These weakness of social infrastructures are concerned by private enterprises including foreign capital companies.

The lack of knowledge and know-how to develop the BCM/BCP is also regarded as a reason not to proceed the implementation of BCP in a private sector such.

3.9 The Current State of the Disaster Risk Management

In order to review the Current State of the Disaster Risk Management, the Questionnaire Surveys was conducted by the local consultant.

3.9.1 Questionnaire Surveys

The questionnaires are prepared for five organizations deeply or markedly related to Area Business Continuity Plan (A-BCP). The purpose of the questionnaires is to analyze the current practices and readiness of both A-BCP and individual BCP. This questionnaires review will be used as a basis for the preparation of the framework of the JICA's Area - Business Continuity Plan formulation.

The questionnaires are conducted for the assessment of :

- 1) The 12 selected industrial parks in Bekasi City, Bekasi Regency and Karawang Regency;
- 2) The disaster risks management applied by the business enterprises as tenants at the KIIC;
- 3) The lifeline utilities services;
- 4) The traffic infrastructure operators;
- 5) The disaster risks management applied by the local governments.

The questionnaires submission to the locators, i.e. business enterprises, was completed by KIIC itself without disclosing the contacts in order to keep privacy of the tenants. The reply was collected from 16 business enterprises within the KIIC. Due to national security reasons, it was hardly to get any detail of infrastructure data related to the national strategic lifeline utilities operator's organizations such as Pertamina, PLN and Telkom.

3.9.2 Reviews of the Questionnaire Surveys of Industrial Parks

The industrial parks in the industrial agglomerated Kota Bekasi, Kabupaten Bekasi and Kabupaten Karawang of West Java Province have been selected as follows:

- 1) Bekasi International Industrial Estate (BIIE)
- 2) East Jakarta Industrial Park (EJIP)
- 3) Greenland International Industrial Centre (GIIC)
- 4) Jababeka Industrial Park (JIP)
- 5) Lippo Cikarang Industrial Park (LPIP)
- 6) MM 2100 Industry Town (MMIT)
- 7) Marunda Industry Park (MIP)
- 8) Karawang International Industry Centre (KIIC)
- 9) Kujang Cikampek Industrial Estate (KCIE)
- 10) Mitra Karawang Industrial Park (MKIP)
- 11) Bukit Indah City Industrial Estate (BCIE)

12) Surya Cipta Industrial Estate (SCIE)

The results of the questionnaire survey of Industrial Parks are reviewed as follows:

- 1) The interruption of lifeline utility services and the causes of the interruption
 - ✓ The interruption time is within 0 (no stop) -3 hours. 2 companies have an interruption time of 12 hours, and one company have an interruption time up to 48 hours (2 days).
 - ✓ Most of the interruption causes come from routine maintenance and network trouble.
- 2) The alternatives for lifeline utility services
- 3) The damages to roads and other traffic infrastructure caused by natural disasters
- ✓ Most of the roads are not affected by natural disasters. Only 1 Industrial Park has suffered damage from flood.



Experience of All Roads Flooded simultaneously

Serious Damages to the Industrial Parks due to Natural Disasters



- 4) The business continuity in disasters
- ✓ Most of the Industrial Parks has no trouble to continuing business while suffering from natural disasters. Only 1 Industrial Park suffered because of flood.



Employees' Availability to Work in Cases of Disasters

- 5) The major requests with respect to disaster control measures to
- \checkmark the local governments
 - \diamond To keep up the good co-operation with the industrial estate (1 IP)
 - \diamond To put more care into regulation problems (1 IP)
 - \diamond To quicken the construction/widening of roads (1 IP)
 - \diamond To coordinate disaster prevention plan (1 IP)
- ✓ lifeline utility services and
 - \diamond To complete the lifeline utility services (1 IP)
 - \diamond None (1 IP)
- ✓ traffic infrastructure services
 - \diamond To provide road access during traffic jam (1 IP)
 - \diamond Alternative public transportation and road access (1 IP)
 - \diamond To increase road quality, lighting, and to reduce traffic jam (1 IP)
 - \diamond To widen road access (3 IP)
 - ♦ Repairing damaged roads due to flood (1 IP)
 - ✤ Industrial Parks seems to be concerned mostly by the narrow road access, therefore most of them wishes the road to be widened.

3.9.3 Reviews of the Questionnaire Surveys of Business Enterprises

The results of the questionnaire survey of Business Enterprises are reviewed as follows:

- 1) The interruption of lifeline utility services
 - ✓ The interruption time is within 3 hours except electricity stop, 12 hours of one tenant.
 - ✓ Backup system

One tenant, out of 16, uses satellite phone.

- 2) Usual traffic infrastructure, roads and others
 - ✓ Expressway: Jakarta-Cikampek Toll road (100% of respondents. i.e. 16 tenants)
 - ✓ Port: Tanjung Priok Harbour
 - ✓ Airport: Soekarno Hatta International Airport
 - ✓ Railway: Jakarta-Cikampek (1 tenant, out of 16 tenants)

- 3) The alternatives for traffic infrastructure
 - \checkmark The road and expressway are the major means of transportation.
 - \checkmark No alternative expressway.
 - ✓ Alternative port: Surabaya, Semarang, Tanjung Intan-Cirebon
 - ✓ Alternative airport: Bandung, Halim Perdanakusuma
- 4) Disaster Prevention Plans, Business Continuity Plans and the concerns



BCP is supposed not to be well recognized among the tenants.

Major concerns with respect to business continuity are as follows:

- ✓ 4 tenants, out of 16, are concerned about the current insufficient infrastructure, i.e. lifeline utilities and traffic infrastructure in general.
- ✓ The tenants reviewed more details of the impacts by insufficient road and expressway for the following issues:
 - ♦ Transportation/ Traffic (General) (Yes: 3 tenants)
 - ♦ Availability, commutation of employees in disasters (Yes: 3 tenants)
 - ♦ Logistics of Products and Raw materials, which are the potential business fundamentals (Yes: 3 tenants)
- ✓ The following are identified concerns or countermeasures to continue business:
 - ♦ Problems with production facility
 - ♦ Storage in remote location
 - \diamond Timing of restoration
 - ✤ Financial support for the recovery from the disaster damages
 - ♦ Public sectors involvement and efforts
- 5) The requests with respect to disaster control measures

The following are the main requests:

- \checkmark To the local governments
 - ♦ Accurate and quick service for information about disasters (4 tenants)
 - Temporal set-up of "Crisis Centre" for support to recover Lifeline Utilities and Traffic Infrastructure (3 tenants)
 - ♦ Recovery of Flood Damage in residence (2 tenants)
 - \diamond To improve insufficient current infrastructure (2 tenants)
- ✓ To the lifeline utility services

- ♦ Alternative facilities (7 tenants)
- ♦ Quick Recovery from Damage in Disasters (5 tenants)
- \checkmark The traffic infrastructure services
 - ✤ To build alternative expressways (4 tenants)
 - ✤ To match Traffic Infrastructure with the traffic volume (4 tenants)
 - ♦ To build alternative Traffic Infrastructure (3 tenants)
 - ✤ To build alternative roads (3 tenants)
 - ♦ Quick Recovery from Damage in disasters (3 tenants)
 - ♦ To build alternative Port (2 tenants)
 - \diamond To build alternative airport (2 tenants)
 - ✤ To build alternative railway (2 tenants)

Tenants seem to be concerned with the risk caused by damages and insufficiency with road and expressway transportation.

3.9.4 Reviews of the Questionnaire Surveys of Lifeline Utility Companies

The results of the questionnaire survey of Lifeline Utility Companies are reviewed as follows:

- 1) Objective and typical disaster for the disaster mitigation plan
 - \checkmark The objective and type of disaster which are commonly included for the disaster mitigation plan is flood.
- 2) Emergency supply of electricity and water
 - ✓ Water emergency supplies are available for up to 18 hours, where electricity supplies are available up to 3 hours only.



Emergency Communication (Satellite-based mobile phones)



Disaster Management Plan



Business Continuity Plan



- 3) Interruption of supply and the causes for the interruption
 - ✓ The only interruption happened to the electricity suppliers due to flood. The supply stops up to 4 days.

Interruption by Incidents / Natural Disasters



- 4) The requests with respect to disaster control measures to
 - \checkmark the local governments:
 - \diamond More water delivery unit
 - \diamond To form executive coordination unit
 - \diamond Flood-proofing the substation
 - ✓ the lifeline utility services:
 - \diamond Better communication on the field
 - ♦ Provide early warning system
 - \checkmark the traffic infrastructure services:

- \diamond More help to distribute clean water
- ♦ Increased security at damaged locations

Lifeline utility companies are concerned mostly about the lack of clean water delivery unit to help distribute clean water on the field.

3.9.5 Reviews of the Questionnaire Surveys of Traffic Infrastructure Companies

The results of the questionnaire survey of Traffic Infrastructure Companies are reviewed as follows:

- 1) Objective and typical disaster for the disaster mitigation plan
 - \checkmark The Objective and type of disaster which are commonly included for the disaster mitigation plan is flood.
- 2) Emergency supply of electricity
 - ✓ Roads and Highway have an available supply of electricity up to 15 hours, whereas the port has an emergency supply more than 24 hours.



Emergency Electricity Supply

Only Pelindo II (port) has an emergency satellite-based mobile phone.

Emergency communication (Satellite-based mobile phones)



✓ Most of the traffic infrastructure companies have a disaster management plan, but most of them doesn't have business continuity plan.



Disaster Management Plan

Business Continuity Plan



- 3) Interruption of supply and the causes for the interruption
 - \checkmark 50% of interruption is caused by flood the other 50% doesn't suffer from interruption.



- 4) The requests with respect to disaster control measures to
 - \checkmark the local governments
 - ♦ A solid prevention team and facility
 - \diamond To ensure better coordination
 - ♦ Routine flood check every year/5 years
 - \checkmark the lifeline utility services and
 - \diamond To provide more health services
 - ♦ To provide more electricity networks
 - the traffic infrastructure services
 - ♦ Additional disaster relief funds
 - ♦ Providing more care into traffic infrastructure
 - ♦ To provide more disaster warning facilities

Traffic infrastructure companies are mainly concerned about the lack of a solid prevention team and facilities such as an early warning disaster system.

3.9.6 Reviews of the Questionnaire Surveys of Local Governments

The results of the questionnaire survey of Local Governments are reviewed as follows:

- 1) Objective and typical disaster for the disaster mitigation plan
 - ✓ The Local Government main objective and type of disasters which are included in their disaster mitigation plan is flood. Other types of disasters are also included but with minimal possibilities.
- 2) Objective and typical disaster for the damage prediction

- ✓ The main object and type of disaster for damage prediction is also flood, storm / storm surge is the second most important disaster type for damage prediction.
- 3) Response in disaster for residents
 - ✓ Response in disaster for residents such as securing evacuate houses, supplying emergency toilet, supplying water and food, are all equally important for the Local Government.
- 4) Response in disaster for companies on recovery of lifeline utility or traffic infrastructure
 - ✓ 5 out of 8 Local Government Agencies do have a policy to help companies to recover lifeline utilities.



✓ 6 out of 8 Local Government Agencies have a policy on recovery of traffic infrastructure.



- 5) Response in disaster on financial supports
 - ✓ 7 out of 8 Local Government Agencies will give financial support to whoever needs it in case of disasters.



6) Damages from disaster to the operation of local governments

- ✓ The previous natural disaster which is flood, deals a lot of damage to public infrastructures; residential area; roads and farms.
- ✓ The operation of Local Government only suffered minimal damage. Most of them do not get damaged.
- 7) Information on hazards/risk open to the public
 - ✓ All Local Government agencies open all kinds of information on every hazards/risks to the public.
- 8) The requests with respect to disaster control measures to
 - ✓ The Central Government
 - ✓ Comprehensive disaster management and planning (1)
 - ✓ Immediate physical & financial supports (4)
 - ✓ River normalization (1)
 - ✓ Flood control pool (1)
 - ✓ Water pumps (1)
 - \checkmark Transportation equipment (1)
 - ✓ Disaster equipment/evacuation, ambulance, instant food (2)
 - \checkmark Better appreciation from the government (2)
 - ✓ Logistic support (1)
 - \checkmark the lifeline utility services and
 - \checkmark To mend the damage to public facility ASAP (1)
 - \checkmark To develop lifeline utilities emergency procedures (1)
 - \checkmark To provide clothes, food, shelter, etc. (1)
 - ✓ To provide emergency raft (1)
 - ✓ Prioritizing on direct action on field (1)
 - \checkmark the traffic infrastructure services
 - $\checkmark \quad \text{Improvement of road (1)}$
 - ✓ Determining disaster response routes (1)
 - $\checkmark \quad \text{Quick repair on facility and infrastructure (1)}$
 - \checkmark To build multi-functional bridges (1)
 - \checkmark Determining evacuation routes (1)

The Local Government seems to be concerned mostly of the need for immediate physical & financial support from the Central Government.

Chapter 4 Profile on the Pilot Area in the Philippines

In the Philippines, as one of the three pilot countries, the Area Business Continuity Plan is simulated in the agglomerated industrial area consisted of Cavite Economic Zone, Laguna Technopark and southern part of Metro Manila. In Chapter 4, the profile of the pilot area is introduced with the results both from Interviews and Questionnaire Survey conducted in August 2013.

4.1 The Outline of Pilot Areas of the Project (The Philippines)

4.1.1 **Basic Information on the Pilot Areas**

Pilot areas in the Philippines are industrial agglomerated areas and areas surrounding them. They are located in Cavite Province, Laguna Province and Southern part of Metro Manila. Pilot areas are encircled by red lines as shown in Figure 4.1.1



Figure 4.1.1 Distribution of pilot areas

Basic information of the pilot areas are presented in the Table 4.1.1 below.

Pilot Area	Industrial agglomerated areas and the areas surrounding them. They are located in Cavite Province, Laguna Province and Southern part of Metro Manila.			
Area and Population	Local Government	Area (Km ²)	Population	
(As of 2010 May)	Metro Manila	636	11,855,975	
	Cavite Province	1,427	3,090,691	
	Laguna Province	1,824	2,669,847	
	* As of May 2010, National Statistics Office, the Philippines			
Natural Condition	Metro Manila, Cavite Province and Laguna Province are located in Luzon island where mountainous and volcanic regions are predominant. Laguna de Bay (superficial area: 949km ²) is the largest lake in the Philippines is located in Southeast of Manila Bay. The Pasig River, most important river in the Philippines, connects Laguna de Bay and Manila Bay. Taal Lake is a freshwater lake in the province of Batangas, on the island of Luzon. The lake fills Taal Caldera, a large volcanic caldera. Volcano Island lies near the center of the lake. The Climate of the Philippines is tropical monsoon characterized by relatively high temperature, oppressive humidity and plenty of rainfall. There are two seasons in the country, the wet season (June to November) and the dry season (December to May). The mean annual temperature is 26.0~27.0.			

4.2 The Outline of the Local Authorities

4.2.1 The Local Administrative System

The Philippines is divided into main classes of three groups and sub-divided into 17 administrative regions. There are 81 provinces in the Philippines. The local administrative system in the Philippines composes province, city, municipality and barangay.

There are three types of cities namely (1) Highly Urbanized Cities and (2) Independent Component Cities, and (3) Component Cities under the jurisdiction of province. Highly Urbanized Cities and Independent Component Cities are on an equal footing with provinces. All of cities are under the jurisdiction of province. All of miniciparities and cities are composed of barangays. Each local government has chief executive, vice-chief executive and councillors selected by election. Barangay composed of 50-100 households is the smallest administrative division in the Philippines. Barangay has a captain, councilors secretary and financial officer but there is no central government staff.

National Capital Region(NCR) is composed of one city and 16 miniciparities. NCR is positioned local government level.



Figure 4.2.1 The Local Administrative System in the Philippines

4.2.2 Disaster Management Organizations

(1) Country Level

The National Disaster Coordination Council was renamed as the National Disaster Risk Reduction Management Council (NDRRMC)" by Republic Act 101211. More authority is granted to NDRRMC followed by the increment of its membership from 23 to 43 (including participants from civil society and private sector). The chairperson of NDRRMC is the Secretary of the Department of National Defense (DND) and four Vice-chairpersons are also appointed in charge of four thematic areas mentioned in Section 4.2. The Administrator of the Office of Civil Defense (OCD), DND is appointed as the Executive Director for NDRRMC. Figure 4.2.2 below shows a detail organizational structure.



Note: Local level disaster risk reduction and management councils are supposed to be established as follows: (1) 17RDRRMCs (Region) (2) LDRRMCs (80 provinces, 138 cities, 1496 municipalities, (3) BDRRMCs (42027Barangays1. RDRRMCs are chaired by the OCD Regional Directors, while other respective level is chaired by the Local Chief Executives.

Figure 4.2.2 Philippines' Disaster Management Structure

(2) Metro Manila

Disaster Management Organization of Metro Manila is shown in Figure 4.2.3. Chairperson of Metro Manila Development Authority (MMDA) posts as Chairman of the organization, Office Civil

Defense (OCD) NCR Regional Director posts as Senior Vice-Chair. Senior Vice-Chair supervises Vice-Chairs in four fields: (1)Preparation and mitigation, (2)preparedness, (3)Response and (4)Rehabilitation.



Figure 4.2.3 Disaster Management Organization of Metro Manila

(3) Cavite Province

Disaster Management Organization of Cavite Province is shown in Figure 4.2.4. Committee on Peace, Public Safety & Order is in-charge of Disaster Management in Cavite Province.



Figure 4.2.4 Disaster Management Organization of Cavite Province

(4) Laguna Province

Disaster Management Organization of Laguna Province is shown in Figure 4.2.5. Provincial Disaster Risk Reduction & Management office is in-charge of Disaster Management in Cavite Province. Provincial Disaster Risk Reduction & Management office works on Research & planning, Warning & Training and Water Search and Rescue.



Figure 4.2.5 Disaster Management Organization of Laguna Province

4.3 Natural Hazards at the Pilot area

4.3.1 **Flood**

(1) The area is suffered from floods and inundation caused by storm rainfalls of tropical cyclones and typhoons.

The Pasig-Marikina River and Laguna Lake Basin in the Metropolitan Manila were suffered from sever flood and inundation by the storm rainfall during the tropical storm Ondoy which was assessed as over 100-year probable flood. The southern part of Metropolitan Manila was affected by storm waters and inundated for one to three days, and the area along the Laguna Lake was submerged for a long time because of the raising water levels from the normal water level (11.50 m) to 13.90 m by the storm rainfall.

Cavite area has been affected frequently by floods, even by 2-year probable floods from of the Imus River, San Juan River and Canas River which flow through the town area.

In the area there are river overflow flood and inundation by storm rainfalls of tropical cyclones and typhoons, and also there are risks of storm surges at the coastal low-lying area, and the severest flood disasters were caused by the Typhoon Milenyo (in 2006), which was evaluated as a 100-year probable flood. However, the industrial estates are generally protected from the floods.

(2) The eastern part of Cavite province in which industrial estates are located is lie close to the Metropolitan Manila. The Provincial Government of Cavite conducts dredging of the major river channels as a flood control measure in order to maintain their discharge capacities. After the typhoon Milenyo a development study were conducted for the flood disaster prevention by JICA from 2007 to 2009 and the project is scheduled to be implemented from 2014. The project is including the construction of three retarding basins (Two at the Imus River and one at the San Juan River) and channel improvements for the Imus and San Juan Rivers.

(3) As for formulation of the National and regional Disaster Prevention Plans, in 2010 a new Republic Act (1012) "Strengthening the Philippine Disaster Risk Reduction and Management System" was issued. Based on the new act, the National and Local Governments have established Disaster Risk Reduction Management Offices and prepared their Disaster Risk Reduction Plans. The MMDA, Provincial Governments of Laguna and Cavite have already prepared their DRRMPs. However, the industrial estates in the area are not involved in the RDRRMP as communities, and the Area BCP had better to consider to participating the RDRRMP.

(4) The flood warning system of the Cavite Provincial Government is totally depending on the information from PAGASA, because the Cavite Provincial Government does not have any own monitoring system like MMDA and Laguna Provincial Government. In Cavite the scales of rivers (Catchment areas: 110 km²~150 km²,River lengths: 42 km ~ 45 km, River slope: 1/66~1/80) are considered, the development of its own monitoring system will be required in order to enhance the safety level of people,

4.3.2 **Typoone/Hydrometrology**

The Philippines is under various risks of natural disasters caused by typhoons and tropical cyclones, floods, flashfloods, mud flows and landslides, storm surges, volcanic eruptions and earthquakes. Typhoon is the most destructive in the country.

Typhoons generally originate in the region of the Mariana and Caroline Islands of the Pacific Ocean and move towards the northwest. 20 typhoons average annually pass through the country, four (4) \sim five (5) of them cause major disasters by floods, storm surges and strong winds.

Recently flood and inundation disasters have been caused by the Typhoon Milenyo of 2006, Typhoon Frank of 2008, Tropical Storm Ondoy of 2009, Typhoon Basyang of 2010 and Typhoon Maring of 201

4.3.3 Storm Surge

The ready project has prepared Hazard Maps of natural disasters including a hazard map of storm surge. According to the hazard map, the hazard area of storm surge is assumed as below two (2) m MSL and 60 Barangays (include 15 Barangays in Cavite city) which are located along the coast are identified as the storm surge disaster risk area.

4.3.4 Earthquake

There is no record of earthquake disaster with casualties in and around the pilot area after the 20th century. However, tracing back the history by the earthquake catalog of PHIVOLCS, the earthquake with over 600 deaths is found in the 17th century. Additionally, the earthquake which induced by the activity of Taar volcano, which is located south of the pilot area, caused several deaths in the 18th century. According to the research of PHIVOLCS, an active fault is running north-south in the east side of Manila and it is estimated that it would wreak serious damage on Metro Manila once it slips. However, the activity of the fault is not clear. On the other hand, there is no record of damage is found caused by the earthquake which occurred along the Manila Trench.

The Global Seismic Hazard Assessment Program (GSHAP) modeled seismic activity globally and conducted probabilistic seismic hazard analysis. The published peak ground acceleration (PGA) for the pilot area with a 10% probability of exceedence in 50 years (475 years in return period) is about 400 gal on the rock site. However, according to the geological map by NAMRIA, some of the pilot area is covered by Quaternary soft sediment and it is expected to amplify the seismic motion around 50 % higher on the ground surface. On the other hand, when 100 years return period is adopted for BCP, smaller PGA would be expected. 180 - 450 gal (MMI 8 - 9) is expected by the analysis of the Study Team. This ground motion level is assumed to cause some damages or troubles to the facilities.



4.3.5 Tsunami

There is a record of 1994 Mindoro tsunami which caused casualties near the pilot area according to the disaster database. Then, tsunami run up to 8 m in Baso island and caused 81 deaths. However, there is no record that tsunami hit directly the pilot area. One reason is because that the pilot area is located behind Manila Bay and is protected from tsunami generated in the open ocean.

PHIVOLCS has developed tsunami hazard map throughout the country and released. According to the tsunami hazard map for Cavite, it is estimated that tsunami will inundate the area of 1 to 2 km from the coastline of the area facing the ocean and in the vicinity of the mouth of Manila Bay by the magnitude 8.2 earthquake occurs along Manila Trench. However, there is no record of damaging tsunami earthquake along Manila Trench and the seismic activity seems not so high. According to the result of statistical analysis using small and medium sized earthquake catalog, the occurrence probability of a magnitude 8 earthquake is expected below.



4.3.6 Volcano

There are about 400 volcanoes in the Philippines and 23 of them are active volcanoes and 26 are potentially active volcanoes. There are three active volcanoes within 100 km of the pilot area. They are Mt. Pinatubo, Mt. Taal and Mt. Banahaw.

According to the disaster database, the eruption of the Mt. Pinatubo in 1991 was the most devastating eruption in the Philippines during recent years and it was the second largest eruption of the 20th century in the world. More than 600 people were killed and about million people were affected by the eruption. Many buildings and infrastructure around Mt. Pinatubo were damaged and ash fall affected on air transportation. Loss amount exceeded 200 million dollars and it was equivalent to 0.2% of Philippines' GDP at that time. On the other hand, Mt. Taal erupted in 1965 and caused 355 deaths and. This volcano erupted also in 1976. The last eruption of Mt. Banahaw is recorded in 1843.

PHIVOLCS developed volcano hazard maps for 14 active volcanoes including Mt. Pinatubo and Mt. Tall. The maps identify hazardous items such as volcanic ash, lava flow, pyroclastic flow, lahar, and volcanic mud flow and they are used utilize for evacuation plans, quick response and land use.

Real time observation system is installed for Mr. Pinatubo and Mt. Taal and PHIVOLCS issues warning of volcanic eruption in five alarm levels. Seismic activity monitoring is conducted for Mt. Banahaw.

4.4 The present state of Industrial Agglomerated Areas in Philippines

For the formulation of Are Business Continuity Plan, Cavite Economic Zone was selected as the industrial park representing the others in the Industrial Agglomerated Areas. There are 42 industrial parks in the three provinces, i.e. Cavite, Laguna and Batangas. The Japanese tenants are located in 17 industrial parks out of 42 parks. The total numbers of the Japanese companies are 292. Among them, 96 Japanese are in Cavite Economic Zone, which is the biggest number of Japanese origin.¹

4.4.1 Industrial Parks in the Industrial Agglomerated Areas

The JICA Study Team visited Cavite Economic Zone and Laguna Technopark for interview. The following are the summary reviews of those two parks:

Cavite Economic Zone (CEZ)

The Cavite Economic Zone is the sole 100% owned and governed by PEZA, which currently manages 2,900 companies with 912 thousands employees all over the Philippines. There are 292 locators at present, operating in CEZ. The major industry companies are mainly from the electronics industry accounting for a total number of 99 companies. This is being followed by the fabricated metal product industry with a total number of 50 locators; the garments & textiles and rubber & plastic the industries each with a total of 35 locators; and the rest followed by paper & board, machine & equipment, office & computing machines, and printing industries each with a total of 17, 9, 9, and 6 locators respectively. Most of these industries are Japanese companies which accounts to a total of 32% of the locator population, which is similar numbers to the locators from South Korea.

For electric power supply in CEZ, one of IPPs, Trans Asia Oil, generates and sells electricity. Transmission is operated by the government corporation NGCP². Distributors to the end user, PEZA are TRANSCO and MELARCO. From January 2013, the power purchase agreement between the IPP and PEZA are signed for five years. PEZA contracts with each locator for power supply with the distribution charge at PHP0.6/kWh, which includes direct cost and overhead cost.



Source: PEZA Figure 4.4.1 Master Plan of Cavite Economic Zone

¹ ASEAN-Japan Centre Website

² National Grid Corporation of the Philippines, privatized to be in charge of Operation & Maintenance of national transmission line owned by Transco (National company)
Laguna Techno Park, Inc. (LTI)

Laguna Technopark, Inc. is located in the government Priority Promotion Centre in Calabarzon region near Metro Manila.

- 1) 50km from the Manila International Airport
- 2) 52km from the Manila North Harbor
- 3) 44km from the Makati Central Business District, i.e. the largest financial centre

In 1989, LTI is established by the joint venture between 75% of the investment of Ayala Land, Ink and 25% of the investment of Mitsubishi Corporation. LTI is an operating Special Economic Zone, which has 220 locators. Most of its locators are Japanese. To date, there are 48% Japanese Enterprises operating inside the LTI which mostly are export manufacturing companies whose businesses activities varies from semi-conductors, automotive, pharmaceuticals, and home appliances³. The rest of the 52% are from the countries Philippines, Korea, America, Italy, Ireland, Singapore, Germany, Australia, Canada, France, Russia, India, Spain, Malaysia, and Netherlands. The actual number of Japanese-owned companies in Laguna Technopark are 90 to date⁴. Most of the locators, i.e. 70%, are exporting companies. The leading manufacturers are from the automotive industry with electronic manufacturing companies coming as second.

Infrastructure at Laguna Technopark includes

- 1) Highway –grade concrete roads
- Digital hybrid fiber-optic telecommunication network capable of full video, data, internet and voice communications
- 3) Ample supply of industrial water and potable water sourced from deep wells
- 4) Available pipelines for the supply industrial gasses
- 5) Sewer and drainage system
- 6) Power Sub-station with one 133MVA and one 50MVA transformers
- 7) Easily accessible through the South Luzon Expressway and three roads
- 8) Administration by Laguna Technopark Association (membership) owns and manage fire brigade and security force
- 9) Bureau of Customs office
- 10) Administration office
- 11) Banking facility
- 12) Multi-purpose hall
- 13) Transport terminals

Sometimes, typhoons, e.g. Milenyo⁵ and Ondoi⁶, cause damage to sewerage system, waste water treatment facility and electricity supply system. Melarco, therefore, installed the power sub-station

³ Honda, Isuzu, Termo, Hitachi, Fujitsu-Ten, Takata

⁴ Source: PEZA and LTI

⁵ September 2006

⁶ the second most devastating cyclone in September 2009

consists of transformers⁷ dedicated to LTI to maintain stable supply to the locators. The routine inspection for power supply system is conducted regularly to minimize the damage of power outage caused by floods and typhoons, which tumble down poles and break electric wires.

4.4.2 A Japanese Manufacturer of Medical Products and Equipment

The main business is manufacturing Syringe and Needle. The production share within the company group is 60% of Syringe and Needle, the biggest share, to supply the markets in Asia, US and EU. Japanese are 16 and the local employees are 2,300, who commute by the company buses from their residence areas. Japan is the only alternative supply source for the products.

Regarding Business Continuity Plan, the head office has organized the fundamental structure. To have alternative factory is the best solution, which is impossible. The basic idea is to pursue the tentative alternatives until the production and supply level is to be back to the normal state. If the production completely stops in Philippines, Japan will alternatively supply, and vice versa. However, before switching the supply source, the following is the current solutions for the inventory control:

- 1) Raw materials, which take longer time to produce, are to be inventory reserve for two months.
- 2) Wrapping film, silicone, solvents and etc. are purchased at the same time from the two alternative sources for security purpose.
- 3) As metal molds are the important tools to produce molded products, the manufacturer contracts with suppliers to be ready to reproduce and delivery upon notice.

4.5 Situation of Infrastructure

4.5.1 **Road**

(1) Outline

The population of the Manila metropolitan area, if the concentration progresses and includes the suburbs, is amounted 21,290,000 people (2011) and the population density is about 3 times of Tokyo.

Although the transportation network supporting this population is still in insufficient level and it is improving gradually by developing annular and radiate roads, a highway, etc., the traffic congestion is still serious.

The traffic system of the Manila metropolitan area is still fundamentally composed of road traffic system, although the orbital traffic systems have been gradually developed after introduction of an orbital traffic system.

There are SLEX (South Luzon Expressway) and Metro Skyway to connect the State of Laguna to the southern metropolitan area. And the State of Cavite shall be connected to the southern metropolitan area, with a Manila-Cavite toll road.

⁷ Two transformers by 133MVA and 50MVA



Table 4.5.1 Introductory Note

Name	Legend
Expressway (NLEX)	
Expressway (SLEX)	
Manila-Cavite Expressway	
Southern Tagalog Arterial Road	
(STAR Tollway)	
Metro Skyway	
Subic-Clark-Tarlac Expressway	
(SCTEX)	

Source: JBIC, Investment Environment of Philippines 2013

Figure 4.5.1 Major Expressway

Table 4.5.2	Outline of Relater	Expressway
14010 11012	Outility of Itelatel	Lapressing

Name	Section	Lane	Length(km)	Commencement
				Year/ Extension
South Luzon Expressway	Calanba-Laguna	8,6,4	36 (60)	1977 / 2011
(SLEX)				
Manila-Cavite Expressway	Manila-Cavite	4	14	1999 / 2011
(CAVITEX)				
Southern Tagalog Arterial	SLEX ~B	4,2	42	2001 / 2008
Road				
Metro Manila Skyway	Metro Manila	6,4	20	1977 / 2009

Source : JBIC, Investment Environment of Philippines 2013

The buses play an important role as the transportation device in Manila, however, almost all bus routes go by EDSA Avenue which is one of the beltways in Manila, and the bus centers are located there. Also jeepneies, tricycles, taxis etc are operating devices. Ricksha called as pedicab also serves as an important popular means of transportation.

4.5.2 **Port**

(1) Manila Port

The Manila Port consists of North Harbor, South Harbor, Manila International Container Terminal: MICT and the grain terminal which is located along the Pasig River and has many lighter cargo work institutions.



Figure 4.5.2Manila PortTable 4.5.3Manila Port

Area	Berth	Length	Width	Depth	Remark
		(m)	(m)	(m)	
North Port	9	220~250	80~100	5~8	Comb-shaped port, total length
					1,200m
South Port	7	240~430	50~100	14	2 piers are for container.
					International cargo is also dealt
					with.
					Total length 975m
					Container yard 30ha
MICT	6	_	_	10.5~12	Total length 1,520m, total area
					94ha
					Container yard 58ha
					Crane 10

Source : Ministry of Land, Infrastructure, Transport and Tourism, Transportation Situation of the Philippines 2011

The handling volume of the container of the Manila Port is yearly increasing by reinforcement of cargo-handling-operation equipments.

Item	Breakout	North Port	South Port	MICT	Total
Number of		5,329	5,671	1,862	12,862
vessels					
Cargo	Total	19,174,424	11,130,626	19,966,465	50,271,515
Throughput	Domestic	14,482,959	4,232,355	1,054,242	19,769,556
(mT)	(Container)	10,902,311	1,482,220	1,054,242	13,438,773

Table 4.5.4Shipping and Cargo Statistics: Port of manila 2012

	Foreign	4,691,465	6,898,271	18,892,293	30,482,029
	(Container)	0	5,973,041	17,940,202	23,913,243
	Transit	0	0	19,930	19,930
	Tranship	0	0	113,668	113,668
Passenger		766,942	161,500	0	928,442

Source: Hearing Survey by Local Consultant

It turns out that the demurrage time is increasing and the congestion level is increasing.

Table 4.5.5 1	Demurrage	Time per	r Boat
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Year	1998	2005	2010
Achievement (h	4.06 (2001)	3.15	7.69

Source : IC-Net Limited, Batangas Port Development Work($\rm I\!I$)

(2) Batangas Port

The Batangas Port has the area of 22.6 ha now, and the facilities of the 1st term are listed as follows.

No.	Usage	Nos.	Specification
1	Foreign General Cargo Berth	1	185m long 、10m deep
2	Multipurpose Berth	1	230m long , 10m deep
3	Domestic General Cargo Berth	3	470m long , 7.3mdeep
4	Ferry Berth	1	124m long 、 4m deep
5	RORO Berth Pier Type	4	5m deep
6	RORO Berth Wharf Type	2	5m deep
7	Fatcraft Berth	7	4-70m long 72 m long 12 0m long
8	8 Passenger Terminal		2 layers×2,132 m2
9	Foreign General Cargo	1	3,892 m2
	TransitShed		
10	Foreign General Cargo Open Area	1	1.3 ha
11	Domestic General Cargo Area 1	1	9,943.70 ha
12	Domestic General Cargo Area 2	1	3.4 ha

Table 4.5.6Facilities of Batangas

Source: PMO-Batangas Officers, Port Introduction Pamphlet

The number of the regular services of the container ship put into service in the Batangas Port now is only one. Therefore, the growth of handling volume is small. In freight handling, the shift in the Batangas Port has not produced the cause from the Manila Port.

Table 4.5.7Cargo in Batangas Port 2012

Item	Breakout	Total
Vessel		5,671

	Total	11,130,626
Cargo	Domestic	4,232,355
Throughput	(Container)	1,482,220
(ton)	Foreign	6,898,271
	(Container)	5,973,041
	Transit	0
	Tranship	0
Passenger		161,500

Source: Hearing Survey by Local Consultant

4.5.3 Railway

(1) Outline

The railways are four (4) in total: one national railways and three lightweight train lines.



Figure. 4.5.3 Traffic Infrastructure in the Region

(2) Philippine National Railway: PNR

The railroad operates in only four directions from the Manila metropolitan area now because of maintenance of road networks, natural disasters, decreased passengers, etc. The service is called Commute Express or Commex. 47,000 passengers are carried by 24 motor cars.

Table 4.5.8Operation Situation of PNR

Line	Section length	Operation	Remarks

Manila-Legazpi	474km	One day one-	Bicol Train
		round trip	
Manil-Naga		One day 2	One way
Manila-Binan	40km	One day one-	Commuter train
		round trip	
Manila-Alaban		One day 23 round	
		trips	

Source: JBIC, Investment Environment of Philippines 2013

(3) Rapid Transit Railway

In the Manila metropolitan area, there are LRT (Light Railway Train) No. 1 and No. 2 lines, and MRT (Metro Rail Transit) No. 3 line.

LRT is under Light Rail Transit Authority (LRTA), and MRT is under management of Department of Transportation and Communications (DOTC). Metro Rail Transit Corporation (MRTC) is taking charge of management. As for the passengers there are the numbers are not seemed increasing.

Name	Length	Start	Station	Average	Operation interval at
	(km)	Year		Passenger	rush hour
LRT1	18	1985	20	About 470,000	1 in 1 minute
				people/day	
LRT2	13	2004	11	About 200,000	1 in 5 minutes
				people/day	
MRT3	17	2000	13	About 500,000	1 in 3 minutes
				people/day	

Table 4.5.9Outline of Rapid Transit Line

Source : JBIC, Investment Environment of Philippines 2013

Name	2010	2011
LRT1	155.87	156.66
LRT2	63.36	63.83
MRT3	153.15	158.81
Total	372.38	379.30

 Table 4.5.10
 Passenger (million people)

Source: LRTA and DOTC / Metrostar Express

4.5.4 Airport

The airport in the Manila metropolitan area is only the Ninoy Aquino International Airport (NAIA) and it is the commercial airport which Manila International Airport Authority (MIAA) is managing. There are two (2) runways: 3,737 m x 60 m, and 2,258 m x 45 m, and four (4) terminals as follows.

Although it is desirable to use 36 landing-and-departure per hour for one runway, actually it seems heavy schedule to use 50 times at the time of summer, and the examination of landing and departure at night is under consideration.

Terminal	Use	Japan Airline	Remarks
		Company of	
		Entrance	
Terminal 1	Only for international airlines	JAL	16 gates
Terminal 2	Centennial Terminal: only for		
	Philippine Airlines (International and		
	Domestic)		
Terminal 3	International and domestic mixture	ANA	
Terminal 4	Only for domestic airlines		Local airlines

 Table 4.5.11
 Ninoy Aquino International Airport

Source : Wikipedia

The Ninoy Aquino international airport is increasing its importance every year, and the growth is remarkable in recent years. However, the handling cargo volume is not seemed remarkably stable even if its growth, because of the remarkable yearly changes. Recently, the government has been using two airports in the Metro Manila area: the Ninoy Aquino international airport and the Clark airport.

At the Clark airport, the 1,015,000 passengers for abroad were handled in 2012. This is about four (4) times of the passengers of 224,000 in 2005.

The Ninoy Aquino international airport is planned to have a function for refugees' as primary accommodating facility at the disaster.

Airport		2008	2009	2010	2011	2012
Manila (NAIA)						
Internationa	1					
	Passenger ('000)	11,273	11,203	12,380	12,969	14,140
	Cargo ('000 MT)	263	238	307	269	311
	Aircraft ('000)	60.5	64.4	67.6	144.8	159.7
Domestic						
	Passenger ('000)	10,980	12,905	14,940	16,583	19,750
	Cargo ('000 MT)	92	186	119	121	150
	Aircraft ('000)	144.7	158.4	168.6	290.7	386.8
Clark						
Internationa	1					
	Passenger ('000)	491	560	608	725	1,015
	Cargo ('000 MT)	0.1	0.1	< 0.1	<0.1	< 0.1
	Aircraft ('000)	2.0	2.6	2.7	7.0	9.3
Domestic						

 Table 4.5.12
 Air Traffic Statistics : Manila and Clark

Data Collection Survey on Natural Disaster Risk Assessment and Area Business Continuity Plan Formulation for Industrial Agglomerated Areas in the ASEAN Region

Passenger ('000)	40	31	46	42	300
Cargo ('000 MT)	<0.1	<0.1	<0.1	0	0
Aircraft ('000)	0.6	0.6	0.4	0.6	3.5

Source : DOTC-Air Transport Planning

4.6 Situation of Public Services

4.6.1 Electricity

(1) Outline

In the area of the Metropolitan Manila and the Province of Cavite, National Power Corporation (NPC) supplies the electric power supply to Manila Electric Company (MERALCO), which distributes electricity to general. In the Province of Laguna First Laguna Electric Cooperative (FLECO) supplies electricity and MERALCO is performing the other areas.

It is an area equivalent to 25% of the population of Philippines, and is proud of the number of customers 5,026,543 (2011).

MERALCO is supplied from Independent Power Producers (IPP) of NPC TSCs and WESM, and also makes an effort to secure new suppliers for a long term.

 Table 4.6.1
 Production of Electricity and Sales of MERALCO

Company	Power Distribution	Product	Distribution	Sales	Sales Share
	Area	(GWh)	Share (%)	(100	(%)
				million	
				pesos)	
MERALCO	National Capital	32,471	67	506	30
	Region (NCR)				

Source : JBIC, Investment Environment of Philippines 2013



Figure. 4.6.1 Distribution Area of Meralco



Source: Hearing Survey by Local Consultant

Figure 4.6.2 Power Facilities in Cavite Province



Source : Province of Laguna, Provincial Development and Physical Framework Plan



(2) Natural Disaster

When the typhoon Milenyo attacked in 2006, the electric power supply was stopped for about ten days at the industrial complex. This is because many utility poles outside fell over.

After this typhoon passed, the electric power was cut off over two days, because facilities of the electric substation and the superannuated power line were damaged.

4.6.2 Water

The water service population around the project area is as follows.

No.	Area	Population Round	Ratio of the	Representation
		Number population to which		City
			safe water is	
			supplied (%)	
NCR	NCR	12 million people	91	Manila
IV- A	CALABARZON	12 million people	89	Laguna, Cavite

Table 4.6.2Water Service Population by District in 2007

Source: Ministry of Health, Labor and Welfare, International Water Promotion Report 2012.3

In the Philippines, the National Economic and Development Authority (NEDA) formulate the National Development Policy, and the maintenance and management of water service are performed based on the policy. Moreover, the National Water Resource Board (NWRB) performs regulation about exploitation of water rates or water resources.

It is the Metropolitan Waterworks Sewerage System (MWSS) to have jurisdiction over the water and sewage of the Metropolitan Manila. About other areas, the municipal corporation (Local Government Unit: UGUs), the Water service union (Community Bases Organization: CBOs) and the civilian enterprise company (Private Operator: PO) are managing.



Figure. 4.6.4 Relation between Government Organizations and Water project objects

Source: Ministry of Health, Labor and Welfare, International Water Promotion Report 2012.3 Note : DPWH: Department of Public Works and Highways LWUA: Local Water Utilities Administration DILG: Department of Interior and Local Government DOH: Department of Health

In the water supply services of Manila, Manila Water Company Inc (MWCI) and Maynilad Water Services Inc (MWSI) are undertaking. As for the West Zone which is the study objective area, Maynilad is supplying water.

		1	1
Concessionaire	Service area	Consumption	No. of Connections
		(mil. m3)	
MWCI	Makati	47.6	N.A.
MWSI	Muntinlupa	3.65	125,511
MWSI	Paranaque	4.43	115,827
	(Old Manila)		

 Table 4.6.3
 Water Consumption in South Manila 2012

Source: Hearing Survey by Local Consultants



Source : Tokyo University, Water Project in Philippines 2008



In the Province of Laguna, there are no accurate and proper data about the water services.

In the Province of Cavite water is supplied to 253,300 places by the 18 water suppliers which are composed of public institutions and private companies. Among these places, 40,778 places are covered by MWSI. According to the statistics in 2012, the water of 1.46 million m³ is supplied for 63,459 households.

Рор	Water supply by				
Level - Hol- Door piped			Level II Level		the other
water supply)			(Water supply by heads such as		methods
45%		public taps)	shallow wells)	(Private wells,	
		100% 25%		tanks, etc.) 20%	
WD	РО	LGU-CBO	LGU		
20%	5%	20%	3		

Table 4.6.4	The water-supplied-population	n ratio according to	o national se	ervice level
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Source: Ministry of Health, Labor and Welfare, International Water Promotion Report 2012.3

4.6.3 Communication

(1) Outline

In the Philippines, diffusion rates, such as fixed-line telephones, are low, therefore their dependence on mobile phones are high also in wireless communications, and they are related to the quick spread of the Internet.

Philippine Long Distance Telephone Company (PLDT) and Globe Telecom monopolize the market of communications industry. National Telecommunications Commission (NTC) is carrying out the regulation and the supervisor of the telecommunication business.

(2) Telephone

In the Philippines, there are only small numbers of subscribers to the fixed-line telephones. In 2011 about 3,550,000 people were subscribed and a diffusion rate is 3.8% in 2011. The geographical conditions which consist of island groups are affecting greatly.

On the other hand the subscribers for mobile phones are 94 million people and the diffusion rate has become 99.3%, one per person.

The prepaid system which pays the charge beforehand with card etc. is common.

In the mobile communications market, two companies: Globe and Smart which are subsidiary companies of PLDT share 99% of the market.

A data fee is 50 pesos per day, and has caused the use expansion of the social medias: E — mail, chat. Although Nokia is most in use among the models of mobile phones, various models such as Samsung, Apple, and Blackberry are also used. It is expected that the growth of the smart phone will be a big from now on.

Year	2007	2008	2009	2010	2011
Number of Fixed-line Telephone	3,940	4,076	6,783	6,783	6,782
Subscribers (1000)					
Diffusion Rate of Fixed-line	4.4	4.5	7.4	7.3	7.2
Telephone %					

 Table 4.6.5
 Subscribers and Diffusion Rates in National Fixed-line Telephone Services

Source: ITU-World Telecommunication/ICT Indicators Database 2012

Province	Items	Fixed-line	Public Calling
		Telephone	Office (PCO)
Laguna	Total	257,525	471
	PLDT	110,881	-
	Digital	60,878	471
	Others	28,766	-
Cavite	Total	151,913	169
	PLDT	95,817	-
	Digital	52,096	169
	Others	4,000	-
Total		409,438	640

 Table 4.6.6
 Fixed-line Telephone in Laguna and Cavite 2011

Source: Hearing survey by local consultant

Table 4.6.7 Subscribers and Diffusion Rate in National Mobile Phone Service

Year	2007	2008	2009	2010	2011
Number of Mobile Phone	57,345	68.117	75,587	79,896	87,256
Subscribers (1000)					
Diffusion Rate of Mobile Phone %	64.7	75.5	82.4	85.7	92.0

Source: ITU-World Telecommunication/ICT Indicators Database 2012

(3) Internet

There are about 5,200,000 subscribers of the Internet (the diffusion rate is 5.5%), and there are about 1,800,000 broadband subscribers (the diffusion rate is 1.9%) in 2011.

Although the Internet is extended favorably, the spread of broadband is not progressing for the height of a monthly amount charge.

The main Internet site in the Philippines serves as 1-Facebook.com, 2- Google Sites, 3- Yahoo Sites, 4-Wikimedia Foundation Sites, and 5- Microsoft Sites.

The share rates of devices at internet access are the desktop PC: 61%, the note PC: 28% and the mobile: 3%.

Year	2007	2008	2009	2010	2011
Number of Broadband Subscribers	496	1,046	1,722	1,722	1,791
(1000)					
Diffusion Rate of Broadband %	0.6	1.2	1.9	1.8	1.9

 Table 4.6.8
 Subscribers and Diffusion Rate in National Broadband Services

Source: ITU-World Telecommunication/ICT Indicators Database 2012

(4) Broadcast Market

Ground television broadcasting is offered by three companies, ABC-CBN, GMA and ABC of commercial broadcasting, and three companies of Peoples TV, Solar TV and IBC of government control broadcasting station. Cable TV is offered by the entrepreneur of 1000 or more companies.

The broadcasting station in Manila covers the provinces of Laguna and Cavite.

4.6.4 Gas

(1) Gas

In the Philippines, liquefied petroleum gas (LPG) is used for home uses and taxis, and the gas cylinder of about 11.2 kg is mainly used. In order to acquire, it is common that we connect with the store of 23 companies and get it to deliver in the Metropolitan Manila area. Cavite has two stores.

The data of the Department of Energy (DOE) shows that there are nine LPG refinery plants in the Province of Laguna, and there are 13 places in the Province of Cavite.

(2) Oil Depot

Oil depots of the region are as follows.

Table 4.6.9 Distribution of Oil Depot in Metro Manila (NCR) and Region 4-A

Region	Province	City/ Municipality	No,	Storage Capacity
				(in '000 barrels, MB)
Total NCR			25	2,077
NCR		Manila	8	1,645
		Mandaluyong	3	144
		Muntinlupa	1	2
		Paranaque	1	94
		Pasay	1	33
		Taguig	2	5
		Pasig	3	50

		Navotas	1	76		
		Caloocan	2	1		
		Valenzuela	3	28		
Total REGION 4-A 💥			15	10,623		
Region 4-A	Cavite	Rosario	1	77		
(Calabarzon)		Naic	1	100.93		
	Laguna	Alaminos	1	1		
	Batangas	Mabni	2	326		
		San Pascual	2	1,783		
		Calaca	1	504		
		Batangas City	4	767		
		Tabangao	2	7,065		
	Quezon	Candelaria	1	0.5		
※ includes refine	ery storage capac	× includes refinery storage capacity				

Source: Hearing Survey by Local Consultant

4.6.5 Waste

(1) Outline

Management of the waste in the Metropolitan Manila area is based on the outline which was decided by the National Solid Waste Management (NSWMC).

The Department of Environment and Natural Resources (DENP) materializes a measure, and the Metro Manila Development Authority: MMDA is performing comprehensive management from the collection of waste to the waste disposal.

The amount of waste generated in the Metropolitan Manila area is 8,400 to 8,600 tons per day, and there is 0.7 kg generated per general household.

16 municipalities in Laguna operate open dumpsites. And private entities also provide waste disposal services. There are two sanitary landfills and one controlled dumpsite operated by private entities. Laguna like Cavite has no data on the volume of waste generation.

In Cavite Province, since it does not have any sanitary disposal landfill site, the waste disposal is a pending issue among residents.

Although the present throughput is unknown, it serves as a 1,540-m³/day in the statistics in 2002. The Cavite municipal government has begun the challenge so that waste treatment can be performed. Although the local government of Cavite is performing an original disposal method, but it has not satisfied the republic Act 9003. Then, efforts to reduce the quantity of the garbage from households are performed for the time being.

(2) Composition of Municipal Waste

The composition according to the sources is as follows.

Ratio (%)					
74.50					
8.18					
10.24					
6.13					
0.75					
0.42					
0.11					

 Table 4.6.10
 Composition According to Source

Source : Tokyo Environmental Public Service Corporation (2003, MMDA)

And composition of municipal waste is as follows.

Name of Waste	Ratio (%)
Kitchen Waste	45
Papers	17
Plastics	16
Metals	5
Mowing grass, trees, etc.	7
Leather and a rubber	1
commodity	
China and stones	1
Fibers	4
Glass	3
Others	1
Total	100

Table 4.6.11Composition of Waste

Source : Tokyo Environmental Public Service Corporation (2003, MMDA)

(3) Final Disposal Site

There is no intermediate treatment and all treatments are of landfill disposal.

With the data of NSWMC, the Metropolitan Manila area, Region III (Central Luzon) and Region IV-A (CALABARZON containing Cavite and Laguna) provide 21 Sanitary landfill sites and 73 open dump sites and 36 Controlled dump sites.

Table 4.6.12 Final Disposal Sites in Metro Manila

Name of Facility	Start of	type	Area	Capacity

Data Collection Survey on Natural Disaster Risk Assessment and Area Business Continuity Plan Formulation for Industrial Agglomerated Areas in the ASEAN Region

	Operation		(ha)	(ton / day)
Montalban Solid Waste Disposal	2002 / 6	Controlled	14	1,321.12
Facility – Rodriguez, Rizal				
Barangay Tanza, Navotas	2002 / 10	Controlled	11	430.00
Lingonan, Valenzuela City	1998	Controlled	14	270.00
Payatas, Quezon City	1973	Opened	21	1,294.00
San Pedro, Laguna		Controlled	14	467.00
Catmon, Malabon		Opened	14	195.00
Pier 18, Tondo, Manila		Opened	-	186.00
Pulang Lupa, Las Pinas		Controlled	7	228.00
			Total	4,391.12

Source : Tokyo Environmental Public Service Corporation (2003、MMDA)

NSWMC has the following statistics limited to Laguna and Cavite other than the above.

Table 4.6.13	Number of Solid	Waste Management	Facilities: Laguna ai	nd Cavite 2011
--------------	-----------------	------------------	-----------------------	----------------

Province	Open	Material	Solid Waste Treatment			
	Dumpsite	Recovery	Number	Total		
		Facilities		(ha)	Capacity	
					(ton/day)	
Laguna	12	128	4	>10.7	>350	
Cavite	5	55	1	800	55	

Source : NSWMC



Source : Province of Laguna, Ecological Profile



Figure 4.6.6 Solid Waste Facilities in Laguna Province

Source: Hearing Survey by Local Consultant

Figure 4.6.7 Solid Waste Facilities in Cavite Province

4.6.6 School

Number of schools and enrollment are as follows.

	Laguna Province Ca		Cavite F	Cavite Province		tal
	2008-	2009	2012			
	School	Student	School	Student	School	Student
Primary/Elementary	757	190,409	1,122	445,036	1,879	635,445
Public	473	-	373	350,650	846	-
Private	284	-	749	94,386	1,033	-
Secondary	251	94,300	513	242,751	764	337,051
Public	105	-	81	74,641	186	-
Private	146	-	432	78,684	578	-
Tertiary	73	-	69	-	142	-
(College and Univ.)						
Public	16	-	16	-	32	-
Private	57	-	53	-	110	-

Table 4.6.14	Number	of schools	and	enrollment
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Source: Hearing survey by local consultant



Source : Province of Laguna, Provincial Development and Physical Framework Plan

Figure. 4.6.8 Education Facilities in the Province of Laguna



Source: Hearing Survey by Local Consultant

Figure. 4.6.9Education Facilities in the Province of Cavite

4.6.7 Hospital

The number of hospitals of Laguna and Cavite Provinces is 102 places.

Table 4.6.15 Number of Hospitals 2009

Item	Laguna	Cavite	Total
------	--------	--------	-------

Total	49	53	102
Government Owned	9	12	21
Private	40	41	81
Number of Beds	1,600	2,312	3,912

Source: Hearing Survey by Local Consultant





Figure 4.6.10 Health Facilities in the Province of Laguna



Source: Hearing Survey by Local Consultant

Figure 4.6.11 Health Facilities in the Province of Cavite

4.7 Economic Relations with Neighboring Regions and Economic Ties with Japan

4.7.1 **Overview of the Economy of Pilot Area**

The pilot area is known as Calabarzon region (the region is located south of Manila, and composed of provinces of Cavite, Laguna, Batangas, Rizal and Quezon) and investment is being made in activities such as construction of industrial parks in the region. Among other regions, Japanese companies, particularly in Automobile, Machinery, and Electronics industries, are currently concentrated in the industrial parks of Batangas region, especially in First Philippines Industrial Park (FPIP) and in Lima Technology Center (LTC). Murata Manufacturing Company, Brother Industries, Canon and SHIMANO are operating in FPIP, and companies such as BANDAI, Furukawa Electric, and Epson are located in LTC. On the other hand, there are not so many opening in the industrial parks in Cavite and Laguna provinces and it is almost impossible to move into the area.

In Port of Manila which serves as an important port infrastructure in the capital region, import accounts for 70% and export accounts for 30% of the total cargo movement, and the port is operating at full capacity on a consistent basis. In Batangas, roadway infrastructure connecting to the port of Manila has been improved, and Port of Batangas is also beginning to be utilized. Similarly, Port of Subic, located north of Manila, is also being improved, and it is considered that increased utilization of these ports will contribute to the improvement of logistic efficiency in Metropolitan Manila.

Traffic jam is especially serious in the central area of Metropolitan Manila, and it is said that it takes about 6-7 hours to reach central Manila from the industrial park in Batangas province (e.g. Lima Technology Center). On the other hand, Port of Batangas is located at a distance of 35 km, and if it is utilized, cargos could be shipped off in a little over one hour, and the economic advantage is obvious. However, the low volume of import at the Port of Batangas makes the operation of logistics operator inefficient.

If Port of Subic and Batangas become available in addition to Port of Manila, alternative logistics route will be secured, and the advantages are obvious even from the point of view of BCP. However, frequency and volume of liner services are scarce under current circumstances, and to date, there have not been much economic benefit.

4.7.2 **Major Economic Policy**

As for economic development plans in the Philippines, a national level plan known as Philippine Development Plan (PDP) and a regional level plan known as Regional Develop Plan (RDP) are established. Both function to propose the framework of the economic policy and are closely linked to one another.

With respect to the details of development process of the plan, preliminary draft of PDP was prepared and circulated among regional offices for review, and then confirmed after their opinions were reflected. After that, RDP is to be established based on PDP. A Regional Development Council is established in each regional office of NEDA, and the opinion of the region will be reflected through the Governor, who shall serve as Council member.

For details of the programs specified in the economic development plan, refer to Provincial Development Physical Framework Plan (PDPFP) and Comprehensive Development Plan (CDP).

4.7.3 **Economic Ties with Japan**

In terms of trade value, Japan is the largest trade partner of the Philippines. Looking at the actual performance over the period of 2010-2011, Japan was the largest export destination in terms of export volume. On the other hand, Japan is also the largest importer from Philippines, along with USA. As for the trade with other countries, import from China has increased drastically, and is approaching the level of Japan and USA.

Also, by examining the amount of foreign direct investment by countries, Japan has become the largest investor in the Philippines. In terms of cumulative amount of FDI approved over the past six years from 2006 to 2011, Japanese FDI has been the largest, accounting for almost one fourth of the total.

The trend of total approved Foreign Direct Investments by promotion agencies during 2005-2010 is shown below.

Due to the negative economic impacts by the world economy recession, the total amount of FDI. The amount of FDI dropped in 2009 but it recovered in the coming next year of 2010. Among the 4 executing agencies, PEZA takes a major role in promoting FDI from foreign countries.



Source: Invest Philippines 2012 (http://www.investphilippines.gov.ph/statistic2.html)

Figure .4.7.1 Total Approved Foreign Direct Investments by Promotion Agencies 2005-2010 [million pesos]

The trend of total approved Foreign Direct Investments by country of Investor during 2005-2010 is shown below. In the total of FDI during 2005-2010, Japan (231.4 billion pesos) is on the top, following Korea (158.0 billion pesos) and the United States (135.0 billion pesos).

COUNTRY	2005	2006	2007	2008	2009	2010	Total
Australia	563	689	705	1,347	799	615	4,719
Belgium	-	-	-	-	-	30	30
Bermuda	-	-	-	654	-	-	654
Br. Virgin Islands	658	5,450	670	2,111	1,176	7,654	17,719
Canada	-	-	-	582	312	157	1,051
Cayman Islands	13,817	384	521	3,616	-	10,638	28,976
China	195	17,935	1,822	2,307	2,392	5,657	30,307
Denmark	-	-	-	-	146	-	146
France	46	1,106	746	822	112	602	3,433
Germany	418	306	3,301	3,765	1,001	1,097	9,887
Hong Kong	93	553	1,464	1,135	3,923	59	7,227
India	-	-	-	-	634	1,857	2,491
Indonesia	-	11	-	-	-	-	11
Italy	8	18	21	-	-	-	47
Japan	27,539	20,066	38,587	16,116	70,737	58,333	231,378
Korea	10,828	54,327	12,077	39,954	9,624	31,182	157,991
Luxembourg	-	-	-	-	726	-	726
Malaysia	69	856	7,562	112	96	754	9,449
Manx	-	-	-	-	-	-	-
Nauru	-	439	-	-	-	-	439
Netherlands	19,208	7,188	14,401	45,354	2,070	36,784	125,005
Norway	-	-	11,175	4,051	64	-	15,290
Singapore	890	6,396	44,246	6,565	3,468	7,284	68,847
Sweden	0	165	3	-	-	-	169
Switzerland	817	605	99	939	2,622	13,557	18,637
Taiwan	1,394	1,953	20,529	1,288	223	1,506	26,892
Thailand	1,535	522	187	38	2,482	1,173	5,937
UK	195	5,887	10,182	25,273	3,439	1,065	46,041
USA	14,913	38,199	36,089	19,721	12,947	13,159	135,029
Others	2,623	2,826	9,696	6,934	2,821	2,908	27,808
TOTAL	95,807	165,880	214,083	182,681	121,816	196,068	976,335

Table 4.7.1Total Approved Foreign Direct Investments by Country of Investor 2005-2010
[million pesos]

Source: Invest Philippines 2012 (http://www.investphilippines.gov.ph/statistic2.html)

The trend of total approved Foreign Direct Investments by industry during 2005-2010 is shown below. In the total of FDI during 2005-2010, "Manufacturing" (558.6 billion pesos) is on the top, following "Electricity" (177.7 billion pesos) and "Finance & Real Estate" (50.6 billion pesos).



INDUSTRY	2005	2006	2007	2008	2009	2010	Total
Agriculture	291	2,381	125	91	2,406	1,209	6,502
Communication	-	2,963	1,307	92	-	-	4,362
Construction	34	766	6,817	33	93	231	7,974.0,
Electricity	10,864	439	74,620	81,279	2,071	8,467	177,739
Finance & Real Estate	203	7,627	9,296	11,557	16,433	5,501	50,617
Gas	90	-	533	-	17	-	640
Manufacturing	67,730	112,665	80,833	48,357	86,133	162,847	558,565
Mining	7,313	724	9,655	3,360	631	6,035	27,717
Services	8,783	17,386	27,740	36,010	10,891	10,894	11,704
Storage	1	13	1,223	13	-	-	1,250
Trade	107	19,591	368	322	153	319	20,860
Transportation	391	1,325	643	1,568	238	567	4,731
Water	-	-	922	-	2,752	-	3,674
TOTAL	95,807	165,880	214,083	182,681	121,816	196,069	976,335

Source: Invest Philippines 2012 (http://www.investphilippines.gov.ph/statistic2.html)

Figure 4.7.2 Total Approved Foreign Direct Investments by Industry 2005-2010 [million pesos]

4.8 Situation of Implementation of BCP in Philippines

4.8.1 Major natural Disaster and Awareness of Disaster Management

In Philippines, typhoon, flood, landslide and earthquake are envisioned as the considerable natural disaster. People commonly don't concern much about natural disaster risk among most enterprises. The necessity of preparing of Disaster Risk Management (DRM) and Emergency response has not been well understood yet.

For most business people in Philippines, the concept of BCP is less well known, and sometimes they consider that there is little difference between BCM and DRM.

4.8.2 Implementation of BCP

(1) Implementation of BCP in enterprises

In a business situation in Philippines, since people have not had an experience of extensive disaster around Manila, the awareness of risk management against natural disaster is quite low. And general enterprises have yet to develop the Disaster Management Plan or Contingency Plan. Furthermore, most enterprises have not conducted the activities for continuing their business at the disaster time.

As an instance of implementation of DRM, manufacturing companies tend to consider the disaster risk in their corporate crisis management. Moreover, a certain enterprises which deal with international business also consider their BCM and develop BCP.

Most SMEs fully rely on local authorities or Large-scale companies to establish their disaster risk mitigation system, since they cannot afford to archive their risk management.

(2) Implementation of BCP in utility supplier and distributor

Utility companies such as electricity, water, telecommunication and others relatively well address the crisis management or DRM, and some of them have already developed contingency plan for the disaster or recovery plan.

Especially for major electricity company, the disaster risk management system and BCM have been established. The individual structures of DRM and BCM are conducted in each their branches, customer centres and data centres. And moreover, they plan to establish the inclusive disaster risk management system through the integration of individual structures.

There is no laws or regulations which stipulate even utility suppliers to be obligated to conduct risk assessment and risk management for natural disaster.

(3) Implementation of BCP in foreign capital companies and Japanese companies

Foreign capital companies which located in an industrial park including automobile manufacturers, electronic manufacturers, food manufacturers and others are regarded as advanced enterprises for corporate disaster management. Moreover, some enterprises which deal with international business are required to build their contingency plan for disaster or BCP as the international agreement and bid tendering.

In other hand, even in foreign capital companies, only some enterprises can afford to conduct BCM for disaster risk. The implementation of BCM/BCP will be addressed popularly, in the future.

4.8.3 Effort for Implementation of BCP

(1) Regulations or Guidelines for Implementation of BCP

Along with the revision of law of Disaster Risk Management in 2010, government also revised the disaster management policy to place a high value on the disaster preparedness and rehabilitation. Before the revision, priority issue of governmental policy was emergency response. This revised law establish the commitment that every local authorities including provinces, municipalities, town and barangay community level have to develop the Disaster Risk Reduction Management Plan (DRRMP). However any certain laws or guidelines stipulating implementation of BCM/BCP have not been considered.

For private enterprises, any laws or regulations stipulating to implement disaster risk management have not been established. To cooperate with national and local disaster risk management is expressly stipulated for every private enterprise and civil organization in the National Disaster Risk Reduction Management Plan (NDRRMP), and private enterprises are also required to implement their risk management along with the national and local disaster risk management systems.

After the development of DRRMP among all local authorities, the Office of Civil Defense (OCD) plans to diffuse the preparedness plan for disaster risk, emergency response plan and also rehabilitation plan after disaster. Furthermore, they consider BCP should be required in the DRRMP in the future.

(2) Effort for diffusion and edification of BCP by private sector

Any particular efforts for diffusion of BCP implementation are conducted in private sector. Some conferences, review meetings or seminars for BCP among private enterprises have been held in conjunction with support form international authorities such as UNISDR and discussed about efforts for edification the BCP concept. As instance of efforts undertaken by private enterprises, an industrial symposium taken place regularly by a major retail company in Philippines have dealt with the implementation of business continuity for crisis management as the main issues in discussion.

4.8.4 **Problem of Implementation of BCP**

The infrastructures such as electricity, water distribution have not been established well enough. Moreover about road infrastructures, main roads around Manila except toll roads are continually flooded by heavy rain or storm, and bring on the trouble for business commuters. Since road network is often stuck in a heavy traffic, it should be one of the bottlenecks of considering BCM.

In addition, most local enterprises in Philippines cannot afford to establish DRM and BCP in the present circumstances.

4.9 The Current State of the Disaster Risk Management

In order to review the Current State of the Disaster Risk Management, the Questionnaire Surveys was conducted by the local consultant.

4.9.1 **Questionnaire Surveys**

The questionnaires are prepared for five organizations deeply or markedly related to Area Business Continuity Plan (A-BCP). The purpose of the questionnaires is to analyze the current practices and readiness of both A-BCP and individual BCP. This questionnaires review will be used as a basis for the preparation of the framework of the JICA's Area - Business Continuity Plan formulation.

Focuses of the questionnaires are;

- 1) Assessment of the 10 selected industrial parks;
- Disaster risks management applied by the business enterprises as tenants at the Cavite Economic Zone;
- 3) Assessment of the lifeline utilities services;
- 4) Assessment of available traffic infrastructure operators;
- 5) Disaster risks management applied by various level of governments.

4.9.2 **Reviews of the Questionnaire Surveys of Industrial Parks**

The interviews with the industrial parks were facilitated by the Philippine Economic Zone Authority (PEZA) through the Office of Deputy Director General for Finance & Administration Mr. Justo Porfirio LL.Yusingco. The following firms were interviewed using the JICA-AHA Interview/Questionnaire for Industrial Parks Managers:

- 1) Laguna Technopark Inc. (Laguna Province)
- 2) Cavite Economic Zone (Cavite Province)
- 3) Northgate Cyberzone (Muntinlupa City)
- 4) Cavite Economic Zone II (Cavite Province)
- 5) Gateway Business Park (Cavite Province)
- 6) Golden Mile Business Park (Cavite Province)
- 7) People's Technology Complex (Cavite Province)
- 8) EMI-Special Economic Zone (Cavite Province)
- 9) Daiichi Industrial Park (Cavite Province)
- 10) First Cavite Industrial Estate (Cavite Province)

The following are the summary of the findings of the interview survey:

Date of requesting and the final collection:

- 1) Date of requesting: September 4, 2013
- 2) Date of final collection: September 20, 2013

The results of the questionnaire survey of Industrial Parks are reviewed as follows:

1) Interruption Of Lifeline Utility Services

Majority of the Industrial Parks suffer no interruptions in lifeline utilities.

1) Incidents and Natural Disasters in the Industrial Parks



Majority have no serious damage during disaster while half stated that flooding is the main difficulty and Majority have employees available to work during disasters.

4.9.3 Reviews of the Questionnaire Surveys of Business Enterprises

The locator survey was similarly facilitated through the PEZA's Office of Deputy Director General for Finance & Administration Mr. Yusingco. The questionnaire was delivered starting first week of September. The following were the responses of the locators in the three (3) industrial parks:

- 1) Cavite Economic Zone (CEZ): 22 out of 146 firms given questionnaires provided answers to the questionnaire survey;
- 2) Laguna Technopark Inc. (LTI): 13 out of 63 firms given questionnaires provided answers to the questionnaire survey;
- 3) Northgate Cyberzone (NC): 2 out of 11 firms given questionnaires provided answers to the questionnaire survey

The low turnout is due to the following factors:

- 1) The short time duration of the study will not allow one to one survey;
- 2) The distribution of the questionnaire as agreed by the JICA-AHA Team with PEZA was through email which increased the chances of no response;
- 3) The strict confidentiality of the industrial parks in which we were not given the distribution list to follow up on the initial email to the locators. Only CEZ allowed us to have the list and followed up with the locators during the last week of September 2013.

The following are the list of respondents per park:

1) Cavite Economic Zone (CEZ)

NUMBER	NAME OF LOCATORS/BUSINESS FIRM
1	ACE Mannix
2	Faith Achieve Plastics Corp.
3	M. UBIS Phils
4	NT Philippines, Inc. (Plant 2)
5	ALE Component Industries
6	HRD Singapore Pte. LTD.
7	Magnetron Phils Corp
8	S-A-N-G-T-O-P Solutions Co. Ltd., Inc.
9	Cavite Manufacturing Corp
10	Nippon Pulse Tech Phils.
11	Ant Steel Corporation
12	Reliance Apparel & Fashion Mfg. Corp.
13	Taesung Phils. Co., Inc.
14	Oakwave Phils., Corp.
15	IM Tech. Co., Inc.
16	DS Tech. Phils., Inc.

Table 4.9.1Locators in CEZ

17	AMCA Packaging Solutions, Inc
18	J-Film Philippines, Inc.
19	Yukio Iimura Mfg. Inc.
20	Dai Shin Han Tech Corporation
21	Keon Yang Industrial Phils., Inc.
22	NANBU PHILIPPINES, INC.

1) Laguna Technopark Inc. (LTI)

Source: WCI (Local Consultant in Philippines)

Table 4.9.2Locators in LTI

NO.	NAME OF LOCATOR/BUSINESS FIRM
1	Ichinomiya Elect Philippines Corp.
2	F-Tech. Phils. Mfg., Inc.
3	JX Nippon Mining & Metals Phils., Inc.
4	Honda Cars Phils., Inc.
5	Surtec Phils., Corp.
6	Imasen Philippine Mfg. Corp.
7	Swedish Match Phil., Inc.
8	EMS Components Assembly, Inc.
9	Terumo (Phils.) Corp.
10	Jfe Shoji Steel Philippines
11	Seafood Fukui Phils., Inc
12	Fujitsu Die-Tech Corp. Phils.
13	Toshiba Information Equipment Phils.

Source: WCI (Local Consultant in Philippines)

1) Northgate Cyberzone (NC)

Table 4.9.3Locators in NC

NO.	NAME OF LOCATOR/BUSINESS FIRM
1	iHub
2	Plaza C

Source: WCI (Local Consultant in Philippines)

The following are the summary of the findings of the survey of locators in the three industrial parks.

Business Enterprises in CEZ

The following are the summary of the findings of the survey of locators or business firms in CEZ:

1) Date of requesting and the final collection

Date of requesting: September 4, 2013

Date of final collection: September 30, 2013

2) Collection ratio (= Collected numbers divided by the total numbers of requesting)

Out of 146 tenants, 21 companies responded.

22/146=15%

3) The reviews and reasons of the insufficient collection ratio

The questionnaires was distributed using email only in which many email addresses bounced back meaning they are not valid anymore. The industrial park manager permitted email follow-up only much later. Initial questionnaire set distributed lacks letter of request and AHA pamphlet. Because of lack of time person to person follow up was not possible.

- 4) The interruption of lifeline utility services
 - ✓ The interruption time for electricity due to natural disaster is experienced by 14 out of 21 firms with a weighted average interruption time of 15 hours;
 - ✓ The interruption time for water due to natural disaster is experienced by 7 out of 21 firms with a weighted average interruption time of 14 hours;
 - ✓ The interruption time for communication due to natural disaster is experienced by 9 out of 21 firms with a weighted average interruption time of 13 hours;



Interruption of Supply by the Natural Disaster

- 5) Usual traffic infrastructure, roads and others
 - ✓ Expressway: Cavitex (13/21)
 - ✓ Port: Port of Manila (8/21)
 - ✓ Airport: Ninoy Aquino Int'l Airport (13/21)
 - ✓ Railway: None
- 6) The alternatives for traffic infrastructure
 - \checkmark The road and expressway are: General Trias Drive (2/21)
 - ✓ Alternative expressway. South Luzon Expressway
 - ✓ Alternative port: Batangas Port
 - ✓ Alternative airport: None
- 7) Disaster Prevention Plans, Business Continuity Plans and the concerns



The Business Continuity Plan (BCP) is not to be well recognized among the tenants.



Business Enterprises in LTI

The following are the summary of the findings of the survey of locators or business firms in LTI:

1) Date of requesting and the final collection

Date of requesting: September 4, 2013

Date of final collection: September 24, 2013

2) Collection ratio (= Collected numbers divided by the total numbers of requesting)

Out of 63 tenants, 13 companies responded.

13/63=21%

3) The reviews and reasons of the insufficient collection ratio

The questionnaires was distributed using email only The industrial park manager did not give address details of the respondents making email follow-up impossible. Because of lack of time person to person follow up was not possible.

- 4) The interruption of lifeline utility services
 - ✓ The interruption time for electricity due to natural disaster is experienced by 8 out of 13 firms with a weighted average interruption time of 11 hours;
 - ✓ The interruption time for water due to natural disaster is experienced by 6 out of 13 firms with a weighted average interruption time of 3 hours;
 - ✓ The interruption time for communication due to natural disaster is experienced by 6 out of 13 firms with a weighted average interruption time of 5 hours;



Interruption of Supply by the Natural Disaster

- 5) Usual traffic infrastructure, roads and others
 - ✓ Expressway: South Luzon Expressway (13/13)
 - ✓ Port: Port of Manila (9/13)
 - ✓ Airport: Ninoy Aquino Int'l Airport (13/13)
 - ✓ Railway: None
- 6) The alternatives for traffic infrastructure
 - ✓ The road and expressway are: National Road, Muntinlupa (5/13)
 - ✓ Alternative expressway. Coastal Road Expressway (2/13)
 - ✓ Alternative port: Batangas Port (8/13)
 - ✓ Alternative airport: Clark Int'l Airport (6/13)
- 7) Disaster Prevention Plans, Business Continuity Plans and the concerns



The Business Continuity Plan (BCP) is well recognized among the tenants.



Business Enterprises in NC

The following are the summary of the findings of the survey of locators or business firms in NC:

1) Date of requesting and the final collection

Date of requesting: September 4, 2013

Date of final collection: September 09, 2013

2) Collection ratio (= Collected numbers divided by the total numbers of requesting)

Out of 11 tenants, 2 companies responded. 2/11 = 18%

3) The reviews and reasons of the insufficient collection ratio

The questionnaires was distributed using email and interview only. The industrial park manager did not give address details of the respondents making email follow-up impossible. Because of lack of time person to person follow up was not possible.

- 4) The interruption of lifeline utility services
 - \checkmark The interruption time for electricity due to natural disaster is experienced by 0 out of 2 firms;
 - \checkmark The interruption time for water due to natural disaster is experienced by 0 out of 2 firms;
 - ✓ The interruption time for communication due to natural disaster is experienced by 0 out of 2 firms;
- 5) Usual traffic infrastructure, roads and others
 - ✓ Expressway: South Luzon Expressway (2/2)
 - ✓ Port: South Harbor Port of Manila (1/2)
 - ✓ Airport: Ninoy Aquino Int'l Airport (2/2)
 - ✓ Railway: None
- 6) The alternatives for traffic infrastructure
 - \checkmark The road and expressway are: None
 - ✓ Alternative expressway. Aguinaldo Highway (1/2)
- 7) Disaster Prevention Plans, Business Continuity Plans and the concerns
Both two (2) respondents have Disaster Risk Reduction and Management Plan and Business Continuity Plan

The Business Continuity Plan (BCP) is well recognized among the tenants.

4.9.4 Reviews of the Questionnaire Surveys of Lifeline Utility Companies

The following are the lifeline organizations which we were able to interview and gathered secondary data:

- 1) Philippine Long Distance Telecommunication Company (PLDT), South Sub-Exchange Unit, Cavite
- 2) PLDT, Main Office, Laguna
- 3) Meralco, Alabang, Muntinlupa
- 4) Maynilad Water Services Inc.

Other lifeline organizations were not able to respond to interview requests.

The highlights of the interview are in the following:

Types of Disasters Treated in Disaster Mitigation Plan and Duration of Interruption



As indicated in the Figure above all the lifeline organizations have three types of disaster categories in their disaster mitigation plan. The duration of disaster interruption is from half a day to whole day.

4.9.5 Reviews of the Questionnaire Surveys of Traffic Infrastructure Companies

The following are the traffic infrastructure organizations interviewed and the gathered data and information:

- 1) Department of Public Works and Highways, Cavite
- 2) Provincial Engineering Office, Cavite
- 3) City Planning and Development Office of Muntinlupa
- 4) City Engineer's Office, Muntinlupa
- 5) Muntinlupa Traffic Management Bureau
- 6) Provincial Engineering Office, Laguna
- 7) Manila North Harbor Port Inc.
- 8) Philippine Ports Authority; Manila South Harbor/Manila Port

The highlights of the interview are in the following:

1) Types of Disasters Treated in Disaster Mitigation Plan and Duration of Interruption



The traffic infrastructure organizations have mostly flooding as the primary type of disaster in their mitigation plan while the duration of interruption during disaster is by majority from 12 to 24 hours.2) Disaster management plan (DMP) and Business Continuity Plan (BCP)



Not all traffic infrastructure organizations have disaster management plan (DMP) and business continuity plan (BCP) unlike the lifeline. This could be due to the fact that all the transportation organizations are in the government. In contrast all the lifeline firms have both DMP and BCP.

4.9.6 **Reviews of the Questionnaire Surveys of Local Government**

The following are the local government unit (LGU) organizations which we were able to interview and gathered secondary data:

- 1) Binan City Disaster Risk Reduction and Management (DRRMO), Laguna
- 2) Sta. Rosa City DRRMO, Laguna
- 3) Provincial DRRMO/PG-COPS, Cavite
- 4) Muntinlupa City DRRMO, Metro Manila
- 5) Provincial DRRMO, Laguna
- 6) Municipality of Rosario DRRMO, Cavite

The highlights of the interview are in the following:

Types of Disasters Treated in Disaster Mitigation Plan



Most have floods as the main type of disaster treated in their mitigation plan.

Response in case of disaster by local government



Only half of the local government units (LGU) prioritizes companies to recover their lifeline/traffic infrastructure and similarly only half of the LGUs get financial support from the national government to help the companies.

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Chapter 5 The Outline of Pilot Areas of the Project (The Vietnam)

5.1 Summary of Pilot Area (Viet Nam)

In Viet Nam, the Study Team has selected the City of Hai Phong as a pilot area (Figure 5.1.1). The City of Hai Phong is located about 100 km west of the capital Ha Noi and also known as one of the main port cities in Viet Nam facing the West China Sea. As of 2011, the City population is 1,878,500 persons and the area is 1,523.4 km² which belongs to the tropical monsoon climate with four seasons including the rainy season from June to September. The monthly average rainfall of Hai Phong is 299 mm and the peak rainfall is observed in August. The City description is summarized in Table 5.1.1



Figure 5.1.1 Location Map of Pilot Area Table 5.1.1 Description of Pilot Area (Hai Phong City, Viet Nam)

Area	City of Hai Phong: 1,523.4 km ²			
	(General Statistic Office of Viet Nam ^{*1} , 2011)			
Population	City of Hai Phong 1,878,500 persons			
	(General Statistic Office of Viet Nam ^{*1} , 2011)			
Natural Condition	It belongs to the tropical monsoon climate with two distinct seasons including the			
	rainy season from May to October with average annual precipitation is 1,600 -			
	1,800 mm (Vietnam Trade Promotion Agency ^{*2} , 2011).			
Other	Located in Viet Nam China Economic Cooperation Belt, the City of Hai Phong			
Characteristics	has an active relation with China (particularly southern China).			

*1: General Statistic Office of Viet Nam: <u>http://www.gso.gov.vn/default_en.aspx?tabid=467&idmid=3&ItemID=12941</u> *2: Vietnam Trade Promotion Agency: <u>http://www.vietrade.gov.vn/en/</u> There are total 7 industrial parks (including operating, constructing and planning) in Hai Phong where many Japanese private companies established businesses. Among the industrial parks in operation, Nomura Hai Phong Industrial Zone has a particularly high occupancy rate of Japanese company that 46 out of 54 tenants are Japanese manufacturing machinery, auto parts and electronic parts.

5.2 Summary of Local Government

Administrative subdivision in Viet Nam is divided into three levels, province, district and rural commune. The City of Hai Phong is municipality which receives direct jurisdiction of Vietnamese government and does not belong to the province. The organization structure of the City of Hai Phong is shown in Reference: JICA Study Team.

5.2.1 Disaster Prevention System: Storm and Flood

In Viet Nam, Disaster Management Center (DMC) is responsible for establishment and management of the Disaster Prevention Systems (Storm and Flood) such as Disaster Monitoring System and Early Warning System. In order for DMC to release timely warnings, National Hydro-Meteorological Service (NHMS) monitors the hydro-meteorological data which data is also disseminate to the public through mass media (television and radio) and their website. (Reference: JICA, 2012)

In order to respond to the warnings announced by the national government, the local government forms "Committee for Flood and Storm Control (CFF&SC)" which mandate is to provide prevention measure and evacuation advisory, disseminate flood/storm information, and conduct the damage evaluation after the natural disaster. The organization structure of CFF&SC in Hai Phong is shown in Figure 5.2.2 (Reference: Hai Phong People's Committee, April, 2013). Hai Phong CFF&SC members are required to take initiative in carry out assigned tasks as stipulated in The Hai Phong People's Committee's order ANNOUNCEMENT No. 02/TB-PCLB&TKCN (Table 5.2.1).

Based on the information gathered from National Government report (Hai Phong CFF&SC, August 2013) and field interviews with locals regarding the Typhoon JEBI (August 2013), it was concluded that the warnings announced by national and local governments reached to local residents in a timely manner. On the other hand, the foreign private companies located in industrial parks reported that they prepared for the typhoon based on the information provided by the embassy of their country and the industrial park management office as the government's official warnings were not available in a timely manner. Is it recommended to implement the improvement of the information dissemination method so that the timely information will be available for all concerned stakeholders including the foreign private companies.

of the information dissemination method so that the timely information will be available for all concerned stakeholders including the foreign private companies.



Reference: JICA Study Team

Figure 5.2.1 Structure of Local Government

Member of Steering Committee for Flood and Storm Control and

Search & Rescue of Hai Phong City

Member of Steering Committee for Flood and Storm Control and Search & Rescue of Hai Phong City
Chief of The Committee: 1. Vice Chairman of Haiphong People's Committee
On Duty Deputy Chief of The Committee: 2. Director of Agricultural and Rural Development Department
Deputy Chief of The Committee 3. Chief of Staff of City Military Department 4. Deputy Chief of City Military Border Defending Department
Member 5. Chief of Administration of City People's Committee 6. Deputy Director of Agricultural and Rural Development Department 7. Deputy Director of Financial Department 8. Deputy Director of Financial Department 9. Deputy Director of Planning and Investment Department 9. Deputy Director of Planing and Investment Department 10. Deputy Director of Public Security Department 11. Deputy Director of Firefighting Department 12. Chief of Staff of Marine Command Zone 1 13. Deputy Director of Industry and Trade Department 14. Deputy Director of Natural resources and Environment Department 15. Deputy Director of Medical Department 16. Deputy Director of Information and Communication Department 17. Deputy Director of Information and Communication Department 18. Deputy Director of Hai Phong Voice and Television 19. Deputy Director of Haiphong Voice and Television 19. Deputy Director of Cat Bi Airport 20. Deputy Director of Cat Bi Airport 21. Deputy Director of Cat Bi Airport 22. Deputy Director of State Reservation Department in Northern East Zone 21. Chief of Technical Battalion of Kien An Cat Bi Airport 22. Deputy Director of State Reservation Department in Northern East Zone 23. Director of Haiphong Port
Chief of Administration 18. Chief of Dyke and Flood & Storm Control Department

Reference : DECISION No. 643/QD-UBND (Hai Phong People's Committee, April, 2013)

Figure 5.2.2 Member of Steering Committee for Flood and Storm Control and Search & Rescue of Hai Phong City

Table 5.2.2 Task List of Steering Committee for	Flood and Storm Control and
Search & Rescue of	f Hai Phong City

No.	Name	Office position	SC position	Section in charge
1	Do Trung Thoai	Vice Chairman of People's Committee	Chief of Steering Committee	- General control.
2	Bui Trong Tuan	Director of Agricultural and Rural Development Department (DARD)	On-duty Deputy Chief; Chief of Flood & Storm Control Sub-Division	 Control the work of the steering committee when the Chief is out; Directly control and coordinate with divisions in assigned works.
3	Nguyen Van My	Chief of Staff of City Military Department	Deputy Chief; Chief of Search and Rescue Sub-Division	 Provide guidance to set up plan to mobilize military force for flood, storm control, search and rescue activities; Directly control and coordinate with search and rescue, earthquake, tsunami.
4	Pham Quang Dao	Deputy Chief of City Military Border Defending Department	Deputy Chief	 Control, manage safety for human and facilities in sea, islands region; Provide guidance to set up plan to mobilize defend force for flood, storm control, search and rescue activities; oil spills accidents.
5	Pham Huu Thu	Chief of Administration of City People's Committee	Member	- Advise and assist Communist party, PPC, People's council in their management activities relating flood, storm control, search and rescue activities; oil spills accidents.
6	Dao Viet Thuan	Deputy Director of Agricultural and Rural Development (DARD)	Member	 Provide guidance to setup plan and methods to ensure safety for fishermen, aquaculture firms and their properties; Assist and supervise activities on flood, storm control, search and rescue for Cat Hai District.
7	Nguyen Thi Thuong Huyen	Deputy Director of Financial Department	Member	 In charge of financial sources to maintain dyke system, flood, storm control, search and rescue activities; to cope with oil spills accident; to overcome natural disaster damages; Assist and supervise activities on flood, storm control, search and rescue for An Duong District and financial sector.
8	Nguyen Thanh Long	Deputy Director of Planning and Investment Department	Member	 In charge of planning and investment to maintain dyke system, flood, storm control, search and rescue activities; to overcome natural disaster damages; Assist and supervise activities on flood, storm control, search and rescue for

				Thuy Nguyen District.
9	Vu Duy Tung	Deputy Director of Transportation Department	Member	 Provide guidance to set up transportation plan and assist activities to maintain transportation system in case of natural disaster happens, to mobilize transportation means to rescue the dyke in emergency cases, To coordinate for flood, storm control, search and rescue activities; to cope with oil spills accident; Assist and supervise activities on flood, storm control, search and rescue for Do Son District and transportation sector.
10	Tran Dinh Vang	Deputy Director of Public Security Department	Member	 Provide guidance to set up plan to maintain security and safety for people before and after natural disaster; To mobilize police force for flood, storm control, search and rescue activities; Assist and supervise activities on flood, storm control, search and rescue for Hong Bang District and police sector.
11	Pham Viet Dung	Deputy Director of Firefighting Department	Member	- Provide guidance to set up plan for firefighting and rescue in case natural disaster happens.
12	Tran Ngoc Quyet	Chief of Staff of Marine Command Zone 1	Member	- Provide guidance to set up plan, to mobilize human resources from Marine Command Zone 1 in emergency cases for flood, storm control, and search and rescue activities.
13	Le Minh Son	Deputy Director of Industry and Trade Department	Member	 Provide guidance to set up plan, to mobilize material, fuel, consumer goods for flood, storm control, search and rescue activities; Assist and supervise activities on flood, storm control, search and rescue for Tien Lang District and Industry-Trade sector.
14	Vu Huu Thanh	Deputy Director of Construction Department	Member	 Provide guidance to set up plan, to mobilize material, facilities of construction sector to rescue damaged houses and for flood, storm control, search and rescue activities; Assist and supervise activities on flood, storm control, search and rescue for Le Chan District and construction sector.
15	Nguyen Tu Trong	Deputy Director of Natural Resources and Environment Department	Member	- Provide guidance to set up plan, to maintain environmental safety in damaged area; take part in setup plan

				and to cope with oil spill activities;
				- Assist and supervise activities on flood, storm control, search and rescue for Kien Thuy District and Environmental sector.
16	Nguyen Tien Son	Deputy Director of Medical Department	Member	- Provide guidance to set up plan for medical sector in damaged area; emergency actions and disease prevention;
				- Assist and supervise activities on flood, storm control, search and rescue for An Lao District and medical sector.
17	Pham Van Tuan	Deputy Director of Information and Communication	Member	- Provide guidance to set up plan to maintain communication for natural disaster damaged area and oil spills;
		Department		- Assist and supervise activities on flood, storm control, search and rescue for Bach Long Vy District and communication sector, communication and post offices.
18	Bui Thanh Long	Deputy Director of Haiphong Voice and Television	Member	- Provide guidance to setup plan for information and communication on flood, storm control, search and rescue as well as oil spills accident;
				- Assist and supervise activities on flood, storm control, search and rescue for Ngo Quyen District.
19	Do Van Binh	Deputy Director of Labor, War Invalids and Social Welfare	Member	 Provide guidance to setup plan for rescue and humanity social policies in damaged regions;
		Department		- Assist and supervise activities on flood, storm control, search and rescue for Duong Kinh District and Labor, Invalids and Social sector.
20	Nguyen Vu Thang	Deputy Director of Hydrometeorology Center in Northern East Zone	Member	- Provide guidance to setup plan and being implementing agency for weather forecast and warning concerning natural disasters;
				- Assist and supervise activities on flood, storm control, search and rescue for Kien An District.
21	Nguyen Thai Thinh	Chief of Technical Battalion of Kien An Cat Bi Airport	Member	- Provide guidance to set up plan, to mobilize human resources from the airport in emergency cases for flood, storm control, search and rescue activities, airlines accidents and oil spills.
22	Nguyen Quoc Tuan	Deputy Director of Cat Bi Airport	Member	- Provide guidance to set up plan, to mobilize human resources from the

				airport in emergency cases for flood, storm control, search and rescue activities, airlines accidents and oil spills.
23	Vu Nhat Le	Deputy Director of State Reserves Department in Northern East Zone	Member	- Provide guidance to set up plan to mobilize the state reserves for flood, storm control, search and rescue activities;
				 Assist and supervise activities on flood, storm control, search and rescue for Hai An District and State Reserves Department in Northern East Zone – Hai Phong region.
24	Bui Van Minh	Director of Haiphong Port	Member	- Coordinate to set up plan and take part in flood, storm control, search and rescue activities; oil spill accidents in Hai Phong area;
				- Assist and supervise activities on flood, storm control, search and rescue in Hai Phong Port area.
25	Tran Van Do	Director of Zone 1 Marine Search and Rescue Center	Member	- Provide guidance to set up plan, to mobilize human resources from the Center in emergency cases for flood, storm control, search and rescue activities in rivers and sea in Hai Phong region.
26	Tran Quang Truong	Secretary of Haiphong Youth	Member	 Provide guidance to set up plan, to mobilize human resources from Hai Phong Youth in emergency cases for dyke prevention, flood, storm control, search and rescue activities;
				- Assist and supervise activities on flood, storm control, search and rescue in Vinh Bao District.
27	Dinh Bang Sat	Deputy Director of Northern Oil Spills Control Center	Member	- Head to setup plan to mobilize human resources from the Center in emergency cases for oil spills accidents.
28	Nguyen Ba Huy	Director of Hai Phong Coastal Information Voice	Member	- Lead to carry out communication activities in The Voice of Hai Phong Coastal Zone;
				- To ensure VHF audio frequency for flood, storm control, search and rescue activities.
29	Nguyen Thanh Hung	Deputy Director of Hai Phong Electric One Member Limited Company	Member	- Lead to set up plan for power sustainable, set priority order for power supply for flood, storm control, and search and rescue activities;
				- Assist and supervise activities on flood, storm control, search and rescue in electric sector.

Tien Flood & Storm Administration Steering Committees for Flood& Storm Control Department Control and Search & Rescue; - Administration activities and reports.	30	Nguyen Ba Tien	Chief of Dyke and Flood & Storm Control Department	Chief of Administration	 Operate activities of the office of City Steering Committees for Flood& Storn Control and Search & Rescue; Administration activities and reports.
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Reference: ANNOUNCEMENT No. 02/TB-PCLB&TKCN (Hai Phong People's Committee, April, 2013)

References:

- JICA, "Study on ASEAN Regional Cooperation for Disaster Reduction Final Report Country Report of Viet Nam" December 2012
- Hai Phong CFF&SC,"Report Prevention and control and recover works response to Tropical Storm JEBI", August 2013
- Hai Phong People's Committee, "DECISION No. 643/QD-UBND: ref. Nomination members for Steering Committee for Flood and Storm control and Search & Rescue of Hai Phong City", April 2013
- 4) Hai Phong People's Committee, "ANNOUNCEMENT No. 02/TB-PCLB&TKCN: Ref. Task assignment for members of Steering Committee for Flood and Storm Control and Search & Rescue of Hai Phong City", April 2013

5.3 Natural Hazards at the Target Area

5.3.1 Flood

(1) Hai Phong City is located at the north-east end coastal area of the Red River and Thai Binh River Delta and flat low-lying area. The area is affected by three (3) to five (5) tropical storms and typhoons per year and has been suffered from serious damages and losses in terms of people and properties. Currently the river over flow risk is low but inundation risk caused by storm waters and storm surges are high. There are habitual inundation areas in the urban area and the maximum daily rainfall was 490 mm (22/09/1927), and the maximum three day rainfalls were 800 mm (6-8/08/1995). Hai Phone City is vulnerable to drainage problems. As for the industrial estates the inundation risks are low but their surrounding areas are vulnerable to the drainage problems, and they have the indirect damages of the drainage problems.

(2) Disaster risk reduction and management organization is the Ministry of Agriculture and Rural Development (MARD) and the Department of Dike Management and Flood Control (DDMFC) of MARD have developed a Master Plan for the Red River Basin. The current M/P was formulated in 2007 and is under the review. In March 2012 a new M/P was formulated and has been under review by the provincial governments. The flood control standards are (1) for the stage 2007-2010 the plan is to ensure control of 250-year probable flood and flood discharge at Son Tay 42,600 m³ /sec, and (2) for the stage 2010-2015 the plan is to ensure control of 500-year probable flood and flood discharge at Son Tai 48,500 m³/s.

For Hai Phong the Provincial People's Committee is responsible for the disaster risk reduction and management plan and the DDMFC is responsible for implementation of the dyke system and maintenance of the safety level.

(3) The basic policy for flood control of the Red River Basin is composed of (1) Control by the Dams: Hoa Binh, Tuyen Quang, Thac Ba and Son La Dams in the upper basin, and (2) Control by the dyke system in the Red River Delta Area and (3) Control of the excessive floods by flood diversion to the flood ways (the Day river and Luong Phu), retention areas and spill ways.

The dyke system for the Red River Delta has been planned based on the historical flood of August 1971 (100-year or 125-year probable flood) and the flood water levels are set as 13.4 meter at Hanoi and 4.34 meter at Hai Phong. At Hanoi the Red River must have a flood discharge capacity larger than 20,000 m³/s at Long Bien Station.

(4) The Hai Phong Sewerage Co. is responsible for the drainage improvement measures in Hai Phong City and has conducted the improvement of drainage system and installed 11 tidal gates. The city has requested the Kita Kyushu City the technical assistances for formulation of the drainage and sewerage improvement plan of Hai Phong City and also for preparation of an inundation map, but due to the Kita Kyushu City there is still no implementation schedule for the request. It will be an urgent task for Hai Phong City to formulate and implement the improvement plan for storm water drainage facilities.

5.3.2 Typhoon/ Meteorological Hazard

Vietnam is subject to the Southeast Asian Monsoon. Hai Phong is affected by three (3) to five (5) storms or tropical low pressures per year on average and one or two of which hit this area. Especially, in 2005, Hai Hong was severly affected by three (3) typhoons (No.2, No6 and No.7).

5.3.3 Storm Surge

The average height of the tides is about $3\sim4$ m while the maximum height is $4\sim4.5$ m in spring water periods. Number of storms hit the region accounted for 17.8% up to 50% of which caused storm surges of over 1.5 m, and 33% of which caused surge of over 2 m. Maximum surges often delayed about 1 hour slower than the landing of the storms. The surge length was about 12 to 30 hours on average. The maximum surge often lasted for 2 to 3 hours. There are six types of the storm surge protection dyke and the crest level of storm surge protection dyke is set at $5.1 \text{ m} \sim 5.8$ m.

As for the protection of Hai Phong from storm surges, the DDMFC is responsible for implementation and maintenance of tide embankments and the Hai Phong Sewerage Co. is responsible for construction and maintenance of tidal gates (11 gates) as a part of the urban drainage improvement.

As for the Observation network for tide levels there are 18 marine stations along the coast of which 5 marine stations are located at Hai Phong area. There is no automatic observation station, but all by manual. The present observation stations are that the density of observation stations is still low and the observation tools have been superannuated because they have been used since the age of Soviet Union. According to the NCHMF it is necessary to improve the observation system including observation network, tools and human resources in order to upgrade their works. The NCHMF prepared an improvement plan and the plan was approved by the government in 2007, but the plan has not implemented yet because of the lack of budget.

The National Center for Hydro-Meteorological Forecasting (NCHMF) is conducting, storm surge analysis and inform to 1. Ministry of Natural Resources and Environment, National Center for Hydro Meteorological Forecasting, 2. Local Commission, 3. Local Press and also to important organizations registered.

References :

- 1) Socialist Republic of Vietnam: "National Strategy for Natural Disaster Prevention, Response and Mitigation to 2020".
- The Central Committee for Flood and Storm Control (CCFSC): "Implementation Plan of the National Strategy for Natural Disaster Prevention, Response, and Mitigation to 2020"

5.3.4 Earthquake

No record of casualties by earthquake in and around Haiphong is found in the disaster database. Existence of active faults is estimated but there is no record of activity. Therefore, seismic activity is not clear.

IGV-VAST have made statistical seismicity analysis based on the estimated active faults and seismic activity around the northwest area of Vietnam near border with China and Lao PDR and estimated 40 to 50 gal as an expected PGA in 500 years return period on rock site of Haiphong area. However, according to the geological map by the governmental organization, the pilot area is covered by Quaternary soft sediment and some amplification of seismic motion is expected.

PGA on the ground surface, considering surface ground amplification, is estimated 55 - 170 gal (MMI 6 - 7) in 500 years return period by the analysis of the Study Team. However, when 100 years return period is adopted for BCP, PGA on the ground surface is estimated 25 - 80 gal (MMI 5 - 6).

5.3.5 Tsunami

No record of casualties by tsunami in and around Haiphong is found in the disaster database. There is concern about the effect of tsunami caused by the earthquake occurs along Manila Trench.

IGP-VAST made a tsunami simulation assuming an occurrence of magnitude 9.3 earthquake after the Tohoku Earthquake in Japan. The result shows that 3 m tsunami strikes the coast of Haiphong 8 hours after the earthquake. On the other hand, there is no record of tsunami earthquake along

Manila Trench caused damage on the Philippines. The occurrence probability of a magnitude 9 earthquake is not so high according to the statistical analysis using middle to small earthquakes.

5.3.6 Volcano

There is no volcano around the pilot area and no record of damage or loss by volcanic eruption is found in the disaster database.

5.4 The Present State of Industrial Agglomerated Areas in Vietnam

In Vietnam, as one of the three pilot countries, the Area Business Continuity Plan is simulated in the agglomerated industrial area consisted of the six industrial parks in Hai Phong city. In chapter 5, the profile of the pilot area is introduced with the results both from Interviews and Questionnaire Survey conducted in August 2013.

5.4.1 The Present State of Industrial Agglomerated Areas in Vietnam

For the formulation of Are Business Continuity Plan, Nomura Hai Phong Industrial Zone was selected as the industrial park representing the others in the Industrial Agglomerated Areas. There are six industrial parks of which are the objective parks by this survey in Hai Phong as follows:

- 1) Dinh Vu Industrial Zone
- 2) Do Son Industrial Zone
- 3) Nam Cau Kien Industrial Zone
- 4) Nomura Hai Pohong Industrial Zone
- 5) Trang Due Industrial Zone
- 6) VSIP Hai Phong Industriasl Zone

'doi moi' measures, the liberalization in 1987 for Foreign Direct Investment (FDI) laws permits foreign investment. As of February 2012, 80% of projects and 85% of capital came from Chinese or Southeast Asian investors. In Haiphong, the total numbers in the six industrial parks are more than 170 locators, more than 40% of which are from Japan. There is only one park, i.e. Nam Cau Kien Industrial Zone, of which has no Japanese tenants.

5.4.2 Industrial Parks in the Industrial Agglomerated Areas

In Hai Phong, Nomura Hai Pohong Industrial Zone has 46 Japanese tenants out of 54 in total. The other potential industrial park, VSIP Hai Phong Industrials' Zone, has six Japanese tenants as detailed below.

Nomura Hai Phong (NHIZ)

In the North of Vietnam, Nomura- Haiphong is the first industrial zone, which was constructed in 1997. This is a joint venture industrial zone between Haiphong city and Nomura Finance Group of Japan with the strategic aim is to attract the famous powerful investors in technology from Japan.

NHIZ is 153 hectares large, of which 123 hectares are for factories and 30 hectares are for public utilities. With well-developed infrastructure facilities, including an independent electric power supply station with a capacity of 50 MW, a 13,500 cubic meter per day water supply plant, a 2,000 line telephone switch, and modern waste water treatment system, as well as roads and many other services, NHIZ is considered one of the most modern industrial zones in Vietnam.





Figure 5.4.1 Nomura Hai Phong Industrial Zone (NHIZ)

Source: NHIZ

- 1) Nearest main road: 1km from National Road No. 5
- 2) Nearest seaport: 15km from Hai Phong port
- 3) Nearest airport: 20 km from Cat Bi airport
- 4) Nearest railway station: 2 km from the nearest station
- 5) Current status:
 - ✓ Fill rate: 100%
 - ✓ Tenants: The Nomura IZ currently has 54 investors, 46 of which are from Japan. Others are from the EU, US, and the Republic of Korea, with a total registered capitalization of nearly US\$1 billion.
 - ✓ Main industrial sectors:
 - Manufacture of machinery and equipment: 14
 - Manufacture of rubber & plastic products: 7
 - Manufacture of electrical equipment: 5

VSIP Hai Phong

VSIP Hai Phong has an urban area, industrial park and service centre on an area of 1,600 ha. It is situated on the north banks of the Cam River, a strategically important location in the city. VSIP

Hai Phong allocates 1,100 ha to urban area development and 500 ha to industrial development and related services.

VSIP Hai Phong has been operating since 2009.





Figure 5.4.2 VSIP Hai Phong

Source: VSIP Hai Phong

- 1) Nearest seaport: 16 km from Hai Phong Port
- 2) Nearest airport: 15 km from Cat Bi Airport, 120km from Noi Bai International Airport
- 3) Nearest railway station: 14 km from Hai Phong railway station
- 4) Current status:
 - ✓ Fill rate: NA
 - ✓ Tenants: 18 in total (including those have leased the land but not operated yet), all of them are Japanese.
 - ✓ Main industrial sectors:
 - Light, Hitech & clean industry: 16
 - Urban development: 2
 - Heavy industry is not promoted because of the possible environmental pollution.

VSIP Hai Phong is developed by the joint venture between Vietnam and Singapore. Becamex, is Vietnam government corporation and Sembcorp is Singaporean, which is invested by Mitsubishi Corporation.

5.4.3 Tenant Companies in Nomura Hai Phong Industrial Zone

The following are the state of Inventory Control implemented by the tenants in Nomura Hai Phong Industrial Zone:

(1) Alternative Production Facilities

Only two companies out of 23 have alternative production facility. One is car parts manufacturer, who will use the production facility in the branch factory of Thai Binh, 50 km away from the company in Nomura Hai Phong Industrial Zone as the alternative production facility in an emergency.

The other is the manufacture of "Airbag Handle" of automobile. The company will use the production facility in the factory in Thailand or China as the alternative production facility in an emergency.

(2) **Products Stocks**

Products are reserved as stocks within the organizations with 15 companies out of 23, which is 65%. The rest, 8 companies, do not have Products Stocks.

(3) Raw Material Stocks

The raw materials are reserved as stocks within the organizations with 16 companies out of 23, which is 70%. The rest, 7 companies, do not have Raw Material Stocks.

5.5 Situation of Infrastructure

5.5.1 Road

(1) Outline

The main roads in Hai Phong are the national route No. 5 and the national route 10.

The national route No. 5 is connecting Hanoi and Haiphong -- it is mostly located in the direction of east and west. The level is two (2). The length is 102 km in total and the width is 23.5m with six-lane. This road links to the national route No. 1 at Hanoi which is the most important highway in Vietnam, and is said as the most modern road in Vietnam: it is the most important trunk road in the northern part. The traffic volume of the national route No.5 shows a high increase rate as no less than 16% yearly. Especially a steep increase of the track is assumed, and the importance is increasing as a transportation route for export-and-import articles from the harbor and the industrial complex in Hai Phong.

The traffic volume of the national route No. 5 was assumed as 15 million tons/year at first, but become 38,400,000 tons/year at the present time.

Since the 5,600 sets of container cars are dealing with the transportation as the core, the increasing trends of transportation weight and congestion have been severe yearly.

Description	Passenger	Van	Bus	Truck	Total
	Car				
Standard Value (28 km in 1993)	1,034	291	281	1,306	2,912
Plan Value (28 km in 2008)	4,319	1,215	1,381	12,289	19,204
Actual Measurement (9 km in	4,788	1,499	4,539	8,955	19,781
2006)					
Plan annual rate of increase	10%	10%	11%	16%	13%
Actual annual rate of increase	13%	13%	24%	16%	16%

 Table 5.5.1
 Traffic in National Route No. 5 (PCU/day)

Source : the Vietnam and Japanese joint evaluation team of 2007 for improvement works of national route No.5

Moreover, the national route No.10 is a road of 157-km, with two-lane in each direction which is located in the east side of Hai Phong, linked to the national route No. 1 at the major-city of Ninh Binh in the south in the direction of northeast from southwest, and linked to the national route No.18 connecting Ha Long Bay (Vinh Ha Long) in the north.

These national roads serve as important trunk roads to connect Hai Phong and the exterior for the physical distribution. Level is 3.

A new highway No. 5 (total length: 105.5 km, width: 35 m) between Hanoi to Hai Phong is under construction and will complete in this fiscal year.

(2) Roads in Hai Phong City

The total road length in Haiphong city is 324 km, and the roads fundamentally consist of Hai Phong Port centered semi circle beltways and radial roads from the port. The numbers of major roads are 33 in total.

(3) Number of Vehicles

The numbers of vehicles in Hai Phong are as follows. Due to the recovery from the economic recession from 2010 to 2011, the numbers of vehicles are obviously increasing.

Туре	2008	2009	2010	2011	2012
Small Car	2,493	2,794	2,847	3,989	3,801
Light Lorry	3,483	3,787	3,835	5,493	6,381
Middle Van	1,606	1,587	1,570	2,948	3,077
Heavy Truck	5,247	5,729	5,474	13,278	11,222
Passenger Car	2,450	2,498	2,680	5,459	4,797
Total	15,279	16,395	16,406	31,167	29,278
Motorbike	40,144	38,058	33,842	26,142	34,368
Bicycle	12,500	12,701	13,571	11,058	11,821

Table 5.5.2Transition of the number of vehicles

Source: Hearing Survey by Local Consultants

5.5.2 Port

(1) Outline

The representative ports in Haiphong are Haiphong Port and Dinh Vu Port.

The Haiphong Port is a river port, and the depth of the access river channel is as shallow as 5.7 m to 7.8 m, and large vessels are not able to enter the port. A 40,000 tons is the maximum.

Allocation of the small feeder boats of 500~700TEU product class are assigned.

The Dinh Vu Port is located at the most downstream of the Cam River. Reclamation and development are carried out at a sandbar, and maintenance works are on going due to the development of an industrial complex.

Due to the progress of dredging works at the front river, feeder boats of a 1,000 TEU stacking class are to be able to call.

When Haiphong international gateway port is to be improved at the offing of Haiphong, a large-sized feeder boat of a 3,000~4,000TEU stacking class is to be able to call.

Table 5.5.3Cargo Throughput

Breakout	2006	2008	2009	2010	2011
Total	11,151,000	13,900,000	14,370,000	15,688,689	17,891,568
Import million t	5,199,000	7,635,000	8,226,000	7,815,129	7,861,456
Export million t	2,825,000	3,231,001	2,376,000	2,858,577	3,989,431
Domestic million t	3,127,000	3,103,000	3,768,000	5,014,983	6,040,681
Container TEUs	464,000	808,000	816,000	953,646	1,018,794
Ship Call	2,056	4,779	4,779	5,298	2,470

(2) Cargo

Source : Vietnam Seaport Association, Shipping Times, Hai Phong Port

(3) Port Facility

The port is mainly distributed and located in three areas (terminal).



Figure 5.5.1 Central Terminal Berth Plan







Figure 5.5.3 Dinh Vu Port Area Berth Plan

Source : Unison Shipping Services / Starline Shipping Agencies (Vietnam)

The port facilities are as follows.

Berth No./ Nos	Length	Depth	Facilities	Ship /C
Central Terminal				
M1~M11, 11	1,717 m	-8.4 m	Shore cranes	General cargo,
			5MT, 10MT, 16MT, 32MT	container, bag,
			Floating Cranes, 10~80MT	bulk vessels
			Forklift	
			Automatic bagging line	
			Electronic scale 80~120MT	
Chua Vu Terminal				
C1~C5, 5	714 m	-8.4 m	Shore crane 40MT	Container,
			Gantry crane 32MT	general cargo
			Dedicated forklifts 2~42MT	vessel

			Elect. scale 80MT	
Dinh Vu Terminal				
DV3~DV7, 5	1,135 m	-10.5 m	Jb/Slewing crane 40MT	Container,
			Quayside gantry crane	general cargo
				vessels
				20,000DWT/
				1,200TEUs

Source : Vietnam Seaport Association, Shipping Times, Hai Phong Port

(4) Access Channel

Name	Length (km)	Width (m)	Critical Depth (m)
Lach Huyen	17.5	100	-7.8
Ha Nam	6.3	70	-5.7
Bach Dang	9.2	70	-6.1
Song Cam	9.8	70	-6.1
Total	42.8		

Table 5.5.5Access Channel

Source : Unison Shipping Services / Starline Shipping Agencies (Vietnam)

5.5.3 Railway

(1) Outline

The Hai Phong - Hanoi - Lao Chai railway is connected to Kunming station in the southern China, and serves as the artery rout of cargo transport to the southern China.

The train schedule is only few as 2 or 3 round trips a day.

The railway is a single track and there are crossing four (4) rivers (bridges) and intersecting 211 roads.

Route	Start	Length	Station	Traveling	Gauge
	Year			Time	
Hanoi-Hai Phong	1902	102 km	18,	2.5 hr	1,000 mm
			Inside of Hai Phong 4		

Table 5.5.6Hanoi-Haiphong Eailway

Source : Wikipedia, Rail transport in Vietnam



Figure 5.5.4 Railway Network around Hai Phong

There are 40 or more industrial estates located along the railway and also many industrial estates under planning and construction. Industrial estates are most concentrating along the national road No. 5. However, most of raw materials which arrive from these industrial estates and products shipped are transported by track, so the contribution of the railway is very small.

The transportation of container, passenger and freight are also conducted, but the scale is also small. Standardization of the gauges and electrification has not been conducted. The Vietnam National Railways (VNR) is managing the railway.

(2) Cargo Transport

The situation of the cargo transportation between Hanoi and Hai Phong is shown in the Table 5.5.7.

The volume of down direction shows increasing of the export and shipment of industrial commodities.

The rail transport besides the container transport is specialized in heavy load transportation of coal, ore, stone, etc. The numbers of carriages attached are less than 28 carriages.

Description	Unit	2001		2010	
		Figure	Share %	Figure	Share %
Freight Volume	ton / year	496,289		1,385,300	
	ton / day	1,360	100	3,795	100
Down Direction	ton / day	653	48	2,467	65
Up Direction	ton / day	707	52	1,328	35

Table 5.5.7Freight Transport between Hanoi and Hai Phong

Source: Japan Railway Technical Service, Improvement Study of Vietnam Railway at the Northern Part including Hanoi and Haiphong cities, and its Logistics, Report summary

(3) Passengers

The numbers of the yearly passengers who went to other districts from Hai Phong Station are as follows.

No.	Travel Rount	Total
1	Hai Phong – Hon Gai	62,212
2	Hai Phong – MongCai	28,7132
3	Hai Phong – Cat Ba	401,066
4	Hai Phong – Thai Binh – Nam	112,424
	Dinh	
5	International passengers	200,000

Table 5.5.8Passenger in Hai Phong Station 2010

Source: Hearing Survey by Local Consultant

5.5.4 Airport

(1) Outline

In Hai Phong area, Noi Bai international airport in Hanoi and Cat Bi airport in Hai Phong are located. Almost all the air cargoes and passengers of both of home and abroad use using Noi Bai international airport

Cat Bi airport in Hai Phong is treating few air cargoes with the passenger transport to Ho Chi Minh City and Da Nang. The airports are managed by Northern Airports Authority.

(2) Noi Bai International Airport

Noi Bai international airport is located at 45-km north from the center part of Hanoi.

Although at present only the terminal 1 is under operation, currently the expansion project is on going and after the completion of the project the terminal 2 and the cargo terminal will be able to be utilized.



Figure 5.5.5 Noi Bai International Airport plan

Source : JETRO, Infra Map 2011

The airport is a joint-use airport of the military and the people and is equipped with two runways (3,800 m x 45 m). The lobby is composed of Lobby A, B for international flights and Lobby C, D for domestic flights.

Lobby A-B is divided with an international airline, and lobby C-D is divided with the domestic flight.

Table 5.5.9	Number of Lnding and Departure in Noi Bai Intl. Airport in August 2013
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Number of departure plane	141 / day
Number of incoming plane	139 / day
Total	280 / day

Source: Hearing Study by Local Consultant

Fable 5.5.10	Air Cargo	in Noi	Bai Intl.	Airport
lable 5.5.10	Air Cargo	in Noi	Bai Intl.	Airport

Year	Handling Cargo	One-day Average
	(tons)	(tons)
2010	324,214	888
2011	249,046	682
2012	281,807	772
2013 up to May	285,841	783

Source: Hearing Study by Local Consultant

The number of passenger is as follows. The rate of increase of 10% or more per year is shown.

Table 5.5.11Number of Passenger

Year	Passenger
2010	9,519,839
2011	10,797,923
2012	11,314,902
2013 up to May	11,556,600

Source: Hearing Study by Local Consultant

(3) Cat Bi Airport

It has a runway (2,400 m x 50 m) and used only for domestic airline. Not larger than B737 and A320 airplanes can be used. The runway will be expanded to 3,050 m by 2015 and the airport is planned to be promoted to an international airport.

During five (5) months of 2013 it recorded 2,448 landing-and-departures, which shows the increase of 16.8% of the flight at the same period of 2012.

The number of passengers has recorded 316,600 passengers landing-and-departure, and shows the increase of 23.29% at the same period of the last year.



Figure 5.5.6 Cat Bi Airport Plan

Source : JETRO, Infra Map 2011

5.5.5 Bus

There are five (5) bus stations in Hai Phong (Cau Rao, Niem Nghia, Tam Bac, Lac Long and Vinh Bao). The total land surface of all the bus centers is $37,130 \text{ m}^2$. As for bus as public transportation, six (6) companies are operating around 113 buses for 13 routs. In addition to this, there is a wagon type minibus in Hai Phong. There are 103 routes as Inter-Province routes and 23 routes as Local routes. 47 companies operate around 570 vehicles. In the taxi, 27 companies operate around 1,700 vehicles.

5.5.6 Waterway

Water transportation through rivers is well-developed. Seven (7) companies are operating 16 boats and 1,400 seats in total.

5.6 Situation of Public Services

5.6.1 Electricity

(1) Outline

As for the electricity in Hai Phong, the electric power of about 8 to 9.5 million KW/day is supplied to the Haiphong Power Company from the Electricity of Vietnam: EVN.

Generally from there, the electricity is supplied to residents through three (3) substations of 220kV and 25 substations of 110kV.

Sub Station	Code	Spec	Location
Vat Cach	1T	125MVA	An Hong commune, An Duong district

Table 5.6.1Sub Station of TBA220kv

Data Collection Survey on Natural Disaster Risk Assessment and Area Business Continuity Plan Formulation for Industrial Agglomerated Areas in the ASEAN Region

	2T	125MVA	An Hong commune, An Duong district
Dong Hoa	1T	125MVA	Dong Hoa commune, Kien An district
	2T	250MVA	Dong Hoa commune, Kien An district
Dinh Vu	1T	250MVA	Dinh Vu industrial, Dong Hai commune

Source: Hearing Study by Local Consultant

Power Line	Code	Distance		Location
220kv Phai Lai-Dong Hoa	AC400	55km	From	Hai Dong
			Via	Dong Hoa
				Kien-An
			То	Hai Phong
HP1 electricity-Dinh Vu	2x400mm2	16km	From	Tam Hung
				Thuy Nguyen
			То	Dong Hai
Dong Hoa-Dinf Vu	2x500mm2	17.7km	From	Tam Hung
				Thuy Nguyen
			То	Dong Hai
Trang Bach-Vat Cach- Dong Hoa	ACK-450	22km	From	Trang Bach
				Quang Ninh
			Via	Hong An Duong
			From	Dong Hoa

Table 5.6.2	220kv Power Line
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Source: Hearing Study by Local Consultant

Table 5.6.3	110kv power line	managed by H	Haiphong Pow	er Company
	1			

No.	Items	Quanntities
1	Number of TBA 110kv	24 TBA
2	Number of MBA 110kv	39 MBA
3	Capacity of MBA	1,468 MVA
4	110kv Lines	377.18 km

Source: Hearing Survey by Local Consultant

Moreover, the stable electric power supply became possible by the reason that Hai Phong Thermal Power Joint Stock Company which is a group company of EVN having begun to work the 1st phase (600 MW=300 MWx2 dynamo) of the Haiphong thermal power plant.

About Hai Phong, the rate of the industrial use is 62%, and is comparatively high.

(2) Distribution and Retail

11 electric distribution companies manage distribution and retail enterprise.

(Hanoi: HPC/HNPC、 Ho Chin minh: HCMPC、 Haiphong: HPPC/NPC、 Dong Nai: DNPC/SPC、 Hai Duong: HDPC、 Ninh Binh: NBPC、 Da Nang: CPC(Da Nang North: PC1、 Da Nang South: PC2、 Da Nang Central: PC3), Khanf Hoa: Khanf Hoa)

Among these, although ten companies are a public corporation of subsidiary self-support accounting of EVN, Khanh Hoa is incorporated.



Figure 5.6.1 Power consumption percentage of each power distribution public corporation

Source : JETRO, Vietnam Electric Power Study 2011

5.6.2 Water

(1) Outline of Water Supply

The category division about the water project of the urban areas in Vietnam is as follows, and Hai Phong is classified into the category 1.

Category of	Configuration	Population	Urban Area
Urban Area			
Special	Big City	1,500,000 or	Hanoi, Ho Chin Minh
Municipality		more	
Category I	Country City	500,000 to	Haiphong, Da Nang, Can Tho
		1,500,000	
Category II	Local City	250,000 t0	Hue, Nha Trang, other 10 cities
		500,000	
Category III	Province City	100,000 to	16 cities
		250,000	
Category IV	Local	50,000 to 100,000	58 LGU
	Government		
	Unit		
Category V	LGU	4,000 to 50,000	612 LGU

Table 5.6.4Category in Urban Area

Data Collection Survey on Natural Disaster Risk Assessment and Area Business Continuity Plan Formulation for Industrial Agglomerated Areas in the ASEAN Region

Source: Ministry of Health, Labour and Welfare, International Water Promotion Report 2012.3

The performance target of the city water service sector is determined by the following classification.

Item	Category of City	2015 年	2025 年
Water Supply	Category I	120 L/Man/day	120 L/Man/day
		(90%)	(100%)
Rate of non-revenue water (%)	Category I	<25%	<15%
Water Supply Time	Category I	24hr	24hr

 Table 5.6.5
 Category
 I
 in Newly developed indicator target 2009 (Haiphong City)

Source: Ministry of Health, Labor and Welfare, International Water Promotion Report 2012.3

The outline of the water service of Haiphong is as follows.

Target Area	Haiphong City			
Water project object name	Haiphong Water Supply Company			
Year	2006	2007	2008	
Population	804,669	836,635	876,809	
Water Supply Population	764,669	836,635	795,096	
Water Service Diffusion	658,248	700,352	90.7%	
Rate				
Number of water supply	81.8	83.7	199,167	
points				
Capacity of Water Supply	22.1	20.9	183,000m3	
Rate of non-revenue water	3,842	3,882	20.4%	
(%)				

 Table 5.6.6
 The outline of the water service of Hai Phong

Source: Ministry of Health, Labor and Welfare, International Water Promotion Report 2012.3

(2) Water-purifying System

Seven water purification plants and water supply zones are located in Hai Phong, and the sum total of water supply capability is 125,000m³/day.

The purification system of An Duong water purification plant in which shows the maximum purifying ability in the city is as follows.

Purifying ability is a 100,000m³/day, and water-purifying sludge is carried out after solar drying.

(3) Water Supply System

Water supply is performed via six water purification plants besides the above-mentioned An Duong water purification plant and six relay pump places from which water is supplied in the city central part.



The extension of water supply pipe is about 2,000 km.

Figure 5.6.2 Water Supply Zone

Source: Matsuo Sekkei, Overseas Business Government-People Joint works Development Project in Water Supply, Study Report 2012.3

(4) Sewerage

Sewerage treatment in Hai Phong is conducted by the Sewerage and Drainage Company (SADCO) which is providing septic tanks.

The World Bank purchased sacking tracks, and provides them to SADO, and SADO is giving its services for all the homes connected with the combined sewer system.

There are 86,501 septic tanks and those are provided with free cleaning service at an interval of 5 years. The number of manholes is 19,048.

(5) Drainage

Since the rainfalls below 500 mm do not cause flood in Hai Phong now because of regulating reservoirs which were developed in many places in the city. However, in the city, there are several hot spots where are inundated by 50 to 100-mm rain. Nguyen Binh Street (Dong Quoc Binh Ward People's Committee), it is an area of Binh Dong Street, the T-junction, the former road No. 5, or others. The inundated water of these areas is drained within 1 to 3 hours, although its depth is 15 to 20 cm. The present drainage facilities in Hai Phong are as follows.

Item	Quantities
Regulating pond system	72.1 ha (11 ponds)
Canals and ditches of all types	57.6 km (6 canals)
Pump stations	2 storm water pump stations
	17 wastewater pump stations
Tide blocking sewers of all types	14
Sewer network	450 km
Gas pits of all types	19,048
Check valve at sluice gates to the lakes or rivers	157

Table 5.6.7Drainage System in Haiphong City

Source : Seawun, Haiphong Wastewater Project

(6) Dyke

In Hai Phong City, 24 lines of Dykes and embankments (416.97 km in total) are constructed along rivers and seashores.

Dyke level	Length (km)
Dyke Level 2	105.881
Dyke level 3	264.757
Dyke Level 4	46.332
Total	416.970

Table 5.6.8Extension of Dykes

Source: Hearing Survey by Local Consultant

(7) Land Use

Land use condition in Hai Phong City is as follows.

Table 5.6.9	Land	Use	Condition	2010

No.	Forms of use	Area(ha)	(%)
1	Land for Agricultural Use (Farm , Fore:	83,754	55.0
2	Non Land for Agricultural Use	64,864	42.6
	Area , Industrial E	s	
3	Unused land	3,720	2.4
Total		152,338	100.0
4	Residents	33,958	22.3
5	National Protection Area	5,000	3.3
6	Sight Seeing Area	19,894	13.1

Source: Hearing Study by Local Consultant

5.6.3 Communication

(1) Outline

Six companies of the fixed communication enterprise of Vietnam enter and provide the Internet services containing fixed telephone service and IP phone.

System	Company Name
Postal administration communication system	Vietnam Post & Telecommunications (VNPT)
National Ministry of Defense System	Vietnam Telephone. (Viettel)
National Power Corporation System	EVN Telecom
Government Joint Venture (JV)	Saigon Postel (SPT)
	Hanoi Telecom
Private Sector System	FPT Telecom

Table 5.6.10	Fixed Communication Enterprise of Vietnam
14010 010110	They communication Enterprise of themain

Source : Hanoi Telecom 2007

The companies of mobile phone are the following six.

System	Company Name
VNPT System	VinaPhone : GSM/GPRS
	MobiFne : GSM/GPRS
Viettel System	Viettel Mobile: GSM/GPRS
EVN Telecom System	VP Telecom : CDMA2000 1x
Saigon Post System	S-Telecom (S-Fone) : CDMA2000 1x
Hanoi Telecom System	HT Mobile : CDMA2000

Table 5.6.11 Companies of Mobile Phone in Vietnam

Source : Hanoi Telecom 2007

As of June, 2011, about 29 million people use the Internet in Vietnam.

(2) Communication in Hai Phong City

In Hai Phong, 1,800 Base Transceiver Stations (BTS) of 2G and 3G types are installed and cover the wireless communications of all the areas in the city.

As for the subscribers to mobile phone, prepaid subscribers are 1,500,000, and postpaid subscribers are 180,000. As opposed to it, there are 250,000 subscribers to a fixed-line telephone.

As for the subscribers to fixed Internet, 40,000 people are the subscribers of the move Internet and 180,000 people are ones of mobile internet. The Internet covers all area of the city.

5.6.4 Gas

There is no gas facility in Haiphong.

5.6.5 Waste

(1) Control System

Recovery and transport business of the waste of Haiphong are carried out at three public corporations under the Haiphong people's committee (HPPC).

Management Corporation	Object Area	
Haiphong Urban Environmental. Company	Hong Bang, Le Chan, Ngo Quyen / 3 Central	
(URENCO)	City Area	
Kien An Public Works State Limited Company	Kien An District	
Dong Son Public Works State Limited	Dong Son District	
Company		

Table 5.6.12Control System of Waste

Source : Kajima Corporation, Vietnam, Study of 3R Promotion and Stabilizing treatment of Urban Waste 2008.3

(2) Recovery Situation

Individual collection of the waste of a center-of-commerce division is carried out by the handcart every day, it is carried to the final disposal site by the packer, and incineration disposal is carried out. Separate collection is not carried out and is collected in mixed state.

The waste carrier materials which Hai Phong URENCO owns are 700 handcarts, five tracks, 40 packers, etc.

Year	Amount of		Recovery Rate
	Generation (t	on/day)	(%)
2005		767	82
2010	1,104	(93
2020	1,496	(95

 Table 5.6.13
 Waste Generation in Whole Haiphong

Source : Kajima Corporation, Vietnam, Study of 3R Promotion and Stabilizing treatment of Urban Waste 2008.3

Table 5.6.14Composition of Waste

Туре	Share (%)
General Waste	46
Business System Waste	29
Street Waste	12
Industrial Waste	10
Medical Waste	1
Construction Waste	2
Total	100

Source : Kajima Corporation, Vietnam, Study of 3R Promotion and Stabilizing treatment of Urban Waste 2008.3

(3) Final Disposal Site

The final disposal site which Hai Phong URENCO has jurisdiction over mainly are three places, Tran Cat disposal site (I, II), Do Son disposal plant, and Dinh Vu disposal plant. These are landfill disposal sites and do not have sufficient facilities for accumulating and processing exudation water.

The two main disposal sites are shown below.

Item	Tran Cat Disposal Site Section II	Dinh Vu Disposal Site	
Place	11km from center of city	17km from center of city	
Area	All 60ha (treatment division 10ha)	All 30ha (treatment division 6ha)	
Start Year	2003	October 2004	
Amount of Waste	Daily waste: 350 ton/day	250 ton/day	
Carrying in			
Hours Operated	365 days in a year	365 days in a year	
Facility	With Leachate treatment equipment	With Leachate treatment equipment	

Table 5.6.15Major Final Disposal Site

Source : Kajima Corporation, Vietnam, Study of 3R Promotion and Stabilizing treatment of Urban Waste 2008.3

5.6.6 School

The schools in Hai Phong are as follows.

Classification	Nos
University	4
College	16
Senior High School	175
Secondary School	350
Primary School	229
Kindergarten School	261

	Fable 5.6.16	Number	of Schools	in	Haiphong
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Source: Hearing Study by Local Consultant

5.6.7 Hospital

The hospitals in Hai Phong are as follows.

Table 5.6.17	Hospital
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Classification	Nos
Hospital	17
Health Center of the Region	14
Total	31
Total Number of Beds	5,626

Source: Hearing Study by Local Consultant
5.7 Economic Relations with Neighboring Regions and Economic Ties with Japan

5.7.1 Overview of the Economy of Target Region

In Vietnam, major Japanese machinery and electronics companies such as Canon, Brother Industries, Honda Motor Co., Ltd., Yamaha Corporation are establishing their manufacturing base by bringing their Japanese suppliers together. Typically, the flow of goods in a manufacturing company starts from a point where necessary parts are imported from Japan to Vietnam, then the suppliers will process the parts and deliver them to major companies which will assemble the parts and complete the products. Under the present situation, many major companies are trying to increase the local supply rate in order to curb the sourcing cost and minimize the lead time. This trend has resulted in the increase of production of the local suppliers (Japanese companies).

In Vietnam, there is a category of manufacturing known as "Export Processing", and under this category, exemptions from import customs duty will be applicable if imported parts are processed and then exported within a period of nine months (naturally, finished products which benefited from this exemption cannot be sold in the domestic market). This system is called the Export Processing Zone (EPZ), and in general, is introduced to provide incentives to foreign companies for the purpose of increasing job opportunities and promoting technical transfer.

Major tenants of Nomura-Haiphong Industrial Zone include Pioneer Corporation, Yazaki Corporation and Toyota Boshoku Corporation, all of which are engaged in manufacturing business focusing on "Export Processing". Therefore, in most of the cases in these companies, parts imported from countries such as Japan are processed inside the industrial zone and finished products are directly exported to other countries (to developed countries such as USA). On the other hand, industrial parks such as Thang Long Industrial Park (developer: Sumitomo Corporation) mainly handle products for domestic market.

5.7.2 Major Economic Policy

At the 11th National Congress of the Communist Party of Vietnam held in January 2011, the 9th five-year plan (2011-2015) was newly adopted. The plan sets goals for achieving the following objectives: increase the average annual economic growth rates by approximately 7 to 8%; increase exports by an average of 12%; decrease budget deficit to about 4 to 5%, from the current deficit of 6.2% of GDP; and to reach a GDP per capita of 2,100 USD by year 2015.

5.7.3 Economic Ties with Japan

Looking at the trade partner of Vietnam, the trade with ASEAN countries and China are increasing. Also, export to USA is sharply increasing. The top three trade partners as of 2009 (provisional value) are China, USA and Japan and these top three countries accounted for about 40% of the total trade. Also, Asian countries such as South Korea, Taiwan and Singapore accounted for more than 50% of total trade volume. As for foreign direct investment (FDI) (on approval basis) by countries, Singapore was at the top of the list, followed by Netherlands and Japan, according to the preliminary figures announced in December 2010.

Foreign Direct Investment projects licensed by main counterparts are shown below. Judging from accumulation of projects having effect as of 31/12/2011, Japan (US\$ 24.4 billion) is on the top, following Korea (US\$ 23.7 billion), Taiwan (US\$ 23.6 billion) and Singapore (US\$ 23.0 billion).

	ccumulation of p	nulation of projects having effect as of 31/12/2011)			
Country	Number of pro	ojects	Total registered c (Mill. USD)	apital	
TOTAL	13,440	100%	199,078.9	100%	
Of which					
Japan	1,555	11.6%	24,381.7	12.2%	
Korea Rep. of	2,960	22.0%	23,695.9	11.9%	
Taiwan	2,223	16.5%	23,638.5	11.9%	
Singapore	1,008	7.5%	22,960.2	11.5%	
British Virgin Islands	503	3.7%	15,456.0	7.8%	
Hong Kong SAR (China)	658	4.9%	11,311.1	5.7%	
Malaysia	398	3.0%	11,074.7	5.6%	
United States	609	4.5%	10,431.6	5.2%	
Cayman Islands	53	0.4%	7,501.8	3.8%	
Thailand	274	2.0%	5,853.3	2.9%	
Netherlands	160	1.2%	5,817.5	2.9%	
Brunei	123	0.9%	4,844.1	2.4%	
Canada	114	0.8%	4,666.2	2.3%	
China, PR	833	6.2%	4,338.4	2.2%	
France	343	2.6%	3,020.5	1.5%	
Samoa	90	0.7%	2,989.8	1.5%	
United Kingdom	152	1.1%	2,678.2	1.3%	
Cyprus	11	0.1%	2,357.9	1.2%	
Switzerland	87	0.6%	1,994.6	1.0%	
Luxembourg	22	0.2%	1,498.8	0.8%	
Australia	261	1.9%	1,316.9	0.7%	
British West Indies	6	0.0%	987.0	0.5%	
Fed. Russian	77	0.6%	919.1	0.5%	
F.R Germany	177	1.3%	900.2	0.5%	
Denmark	92	0.7%	621.5	0.3%	
Finland	7	0.1%	335.4	0.2%	
The Philippines	61	0.5%	302.3	0.2%	
India	61	0.5%	233.8	0.1%	
Mauritius	34	0.3%	229.2	0.1%	
Indonesia	30	0.2%	219.7	0.1%	
Bermuda	5	0.0%	211.6	0.1%	
Italy	40	0.3%	191.9	0.1%	
Slovakia	4	0.0%	147.9	0.1%	
Cook Islands	3	0.0%	142.0	0.1%	
United Arab Emirates	4	0.0%	128.4	0.1%	
Chanel Islands	15	0.1%	114.4	0.1%	
Bahama	3	0.0%	108.6	0.1%	
Belgium	40	0.3%	106.7	0.1%	
Norway	28	0.2%	102.4	0.1%	
Poland	9	0.1%	98.7	0.0%	
New Zealand	18	0.1%	76.4	0.0%	
Sweden	28	0.2%	71.7	0.0%	

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Source: General Statistics Office of Vietnam

Foreign Direct Investment projects licensed by kinds of economic activity are shown below. Judging from accumulation of projects having effect as of 31/12/2011, "Manufacturing" (US\$ 94.7 billion) accounts for about half of the total, following "Real estate activities" (US\$ 48.2 billion).

 Table 5.7.2
 Foreign Direct Investment Projects Licensed by Kinds of Economic Activity

	(Accumulation of projects having effect as of 31/12/2011)						
Economic activity	Number of p	rojects	Total registered capital (Mill. USD)				
TOTAL	13,440	100.0%	199,079	100.0%			
Agriculture, forestry and fishing	495	3.7%	3,265	1.6%			
Mining and quarrying	71	0.5%	3,016	1.5%			
Manufacturing	7,661	57.0%	94,676	47.6%			
Electricity, gas, stream and air conditioning supply	72	0.5%	7,392	3.7%			
Water supply, sewerage, waste management and remediation activities	27	0.2%	2,402	1.2%			
Construction	852	6.3%	10,324	5.2%			
Wholesale and retail trade; Repair of motor vehicles and motorcycles	690	5.1%	2,119	1.1%			
Transporation and storage	321	2.4%	3,257	1.6%			
Accommodation and food service activities	319	2.4%	10,523	5.3%			
Information and communication	736	5.5%	5,710	2.9%			
Fiancial, banking and insurance activities	75	0.6%	1,322	0.7%			
Real estate activities	377	2.8%	48,156	24.2%			
Professional, scientific and technical activities	1,162	8.6%	976	0.5%			
Administrative and support service activities	107	0.8%	188	0.1%			
Education and trainning	154	1.1%	359	0.2%			
Human health and social work activities	76	0.6%	1,082	0.5%			
Arts, entertainment and recreation	131	1.0%	3,603	1.8%			
Other activities	114	0.8%	712	0.4%			

Source: General Statistics Office of Vietnam

Foreign Direct Investment projects licensed by province are shown below. Judging from accumulation of projects having effect as of 31/12/2011, "South East" (US\$ 93.7 billion) including Ho Chi Minh is on the top by region, following "Red River Delta" (US\$ 47.4 billion) including Hanoi and Hai Phong.

 Table 5.7.3
 Foreign Direct Investment Projects Licensed by Province

	(Accumulation of projects having effect as of 31/12/2011				
Region/Province Numb		Number of projects		apital	
WHOLE COUNTRY	13,440	100%	199,079	100%	
Red River Delta	3,682	27.4%	47,443	23.8%	
Hà Nội	2,253	16.8%	23,596	11.9%	
Vĩnh Phúc	143	1.1%	2,274	1.1%	

Bắc Ninh	251	1.9%	2,957	1.5%
Quảng Ninh	95	0.7%	3,794	1.9%
Hải Dương	253	1.9%	5,286	2.7%
Hải Phòng	338	2.5%	6,133	3.1%
Hưng Yên	214	1.6%	1,785	0.9%
Thái Bình	32	0.2%	254	0.1%
Hà Nam	42	0.3%	408	0.2%
Nam Định	38	0.3%	209	0.1%
Ninh Bình	23	0.2%	747	0.4%
Northern midlands and mountain areas	345	2.6%	2,857	1.4%
North Central area and Central coastal area	809	6.0%	41,458	20.8%
Central Highlands	135	1.0%	773	0.4%
South East	7,746	57.6%	93,694	47.1%
Mekong River Delta	678	5.0%	10,258	5.2%
Petroleum & Gas	45	0.3%	2,597	1.3%

Source: General Statistics Office of Vietnam

The number of foreign direct investment projects licensed continue efficacy by counterparts in Hai Phong, which is the target project area in the research, are shown below.

Judging from accumulation of projects having effect as of 31/12/2011, Japan (US\$ 563.4 billion) is exceptionally large, following Singapore (US\$ 22.6 billion).

Table 5.7.4Number of Foreign Direct Investment Projects Licensed Continue Efficacy in HaiPhong by Counterparts

			(As o	of 31/12/201
	Number of pro	Number of projects		
Total	30	100%	611,655	100%
Of which				
Japan	10	33.3%	563,426	92.1%
Singapore	2	6.7%	22,600	3.7%
Hongkong	2	6.7%	8,400	1.4%
Taiwan	2	6.7%	3,584	0.6%
Korea	3	10.0%	2,200	0.4%
China	5	16.7%	2,200	0.4%
Holland	1	3.3%	715	0.1%
Thailand	1	3.3%	330	0.1%
Others	4	13.3%	8,200	1.3%

Source: Haiphong Statistical Yearbook 2011

Similarly, Foreign Direct Investment projects licensed by kinds of economic activity in Hai Phong, which is the target project area in the research, are shown below.

Judging from accumulation of projects having effect as of 31/12/2011, "Construction" (US\$ 321.0 billion) is on the top, following "Manufacturing" (US\$ 266.6 billion)

Table 5.7.5 Foreign Direct Investment Projects Licensed by Kinds of Economic Activity

(Accumulation of projects having effect as of 31/12/2011)

Economic activity Number of projects	Total registered capital <i>(Mill. USD)</i>
--------------------------------------	---

Data Collection Survey on Natural Disaster Risk Assessment and Area Business Continuity Plan Formulation for Industrial Agglomerated Areas in the ASEAN Region

TOTAL	30	100.0%	611,655	100.0%
Manufacturing	22	73.3%	266,575	43.6%
Electricity and water supply				
Construction	1	3.3%	321,000	52.5%
Trade	5	16.7%	1,480	0.2%
Hotel and restaurant	1	3.3%	20,600	3.4%
Transporation and storage	1	3.3%	2,000	0.3%
Real estate; renting business activities				
Education and trainning				
Culture and sport				
Health				

Source: Haiphong Statistical Yearbook 2011

5.8 Situation of Implementation of BCP in Vietnam

5.8.1 Major Natural Disaster and Awareness of Disaster Management

In Vietnam, the government and enterprises consider typhoon, flood and storm surge for natural disaster risk. The committee handling climate change and sea level rise are established in governmental ministries in charge of disaster management such as Ministry of Agriculture and Rural Development (MARD) or Ministry of Industry and Trade (MOIT), and they deal with improvement of regulations for disaster risk control.

Since the experience for disaster which causes damage to the business activities has not been rarely observed in the northern part of Vietnam centered around Hanoi and Hai-Phong, business people doesn't concern well about natural disaster risk in business situation, and the necessity of disaster management system in business are barely understood. The local administrative agencies don't either cognize well about the value of BCM/BCP.

Vietnam Chamber of Commerce and Industry (VCCI) can support SMEs to establish their activities for business continuity in emergency time in conjunction with contingency response system. They assume that the concepts of BCM and Disaster Risk Management (DRM) are not discriminated.

5.8.2 Implementation of BCP

(1) Implementation of BCP in enterprises

In Vietnam, enterprises generally can't work in the effort for disaster risk mitigation in business situation, and corporate disaster management are barely valued among most business managers. The individual enterprises have less concern about disaster risk mitigation, since they have not had much experience of enormous disasters in northern Vietnam, especially in industrial parks in Hai-Phong or other states.

As example of implementation of DRM, large-scale enterprises and foreign capital companies conduct disaster risk assessment or establish disaster risk management. However, most SMEs can't afford to consider the their DRM in the present circumstances. Enterprises which established DRM are mainly engaged in emergency response or contingency management, not disaster preparedness.

(2) Implementation of BCP in utility Supplier and Distributor

Enterprises which have hazardous materials such as oil, coal or minerals, and enterprises which are in charge of utilities such as electricity corporation have developed contingency plan or crisis management plan. These enterprises and corporations are obligated by laws to establish their crisis management system. Though corporate response in emergency time mainly caused by flood or storm and policy for quick recovery of business activities are defined in these contingency or management plan, the cases of development of the specific BCP have not been determined yet.

(3) Implementation of BCP in foreign capital companies and Japanese companies

Although BCP is not well known yet even among foreign capital companies in Vietnam, requirement of BCP from head office or related customers is gradually increased. Moreover, Japanese enterprises become increasingly concerned about BCP implementation, and the Japan Business Association in Vietnam (JBAV) make an effort for enlightenment of BCP among the member companies.

Even in a foreign capital company, they generally are not concerned about natural disaster risk. Except certain large-scale companies, most enterprises do not conduct BCM/BCP.

5.8.3 Effort for Implementation of BCP

(1) Regulations or guidelines for implementation of BCP

In present legislative system, "Decree No. 168-HDBT" outlines the role of the Central Committee of Storm and Flood Control (CCSFC), committees and sectors at every local level. In this decree, the corporation of private sectors to the disaster damage assessment and rehabilitation action is defined as corporate obligation. As against, any laws for defining corporate effort to development BCP or Disaster Risk Management Plan have not been found.

The new Law of Disaster Risk Management will become effective in 2014. In the new law, development of Disaster Risk Management Plan is obligated among all enterprises and agencies. However they still do not regulate about development of Contingency Plan or BCP.

Disaster management policy in Vietnam had focused on mitigating human suffering not reducing business loss. The concerns of implementation of BCP are increased due to the consideration of disaster damage impacts on economics and foreign investment. The symposium gathering ASEAN countries for discussing BCP has been held.

(2) Effort for diffusion and edification of BCP by private sector

Efforts for diffusion of DRM to SMEs conducted by private sectors such as VCCI are implemented. Though the establishment of emergency response and preparedness for disaster should be higher priority than BCP, for instance the symposium of corporate DRM has been held, and generally enterprises are getting more concerns of business continuity at the disaster time.

VCCI has strong motivation for diffusing the corporate disaster management to SMEs, and they are considering about certification standards of disaster management as CSR.

(3) Problem of implementation of BCP

In Vietnam, most enterprises and state administration think DRM in business is less important and they have put weight on business growth, not implementation of BCP. As corporate risk management, the DRMs should be conducted first.

Due to the short of resources using DRM or disaster risk assessment, improvement of social infrastructures such as electricity, water and traffic network has not been archived. And private enterprises assume that they cannot afford to develop their disaster management and BCM.

The lack of knowledge or technical know-how of risk assessment, development of BCP and so on is also regarded as a problem.

5.9 The Current State of the Disaster Risk Management

In order to review the Current State of the Disaster Risk Management, the Questionnaire Surveys was conducted by the local consultant.

5.9.1 Questionnaire Surveys

The questionnaires are prepared for five organizations deeply or markedly related to Area Business Continuity Plan (A-BCP). The purpose of the questionnaires is to analyze the current practices and readiness of both A-BCP and individual BCP. This questionnaires review will be used as a basis for the preparation of the framework of the JICA's Area - Business Continuity Plan formulation.

Focuses of the questionnaires are:

- 1) Assessment of the six industrial parks in Hai Phong;
- Disaster risks management applied by 54 business enterprises as tenants at Hai Phong Industrial Zone;
- 3) Assessment of the lifeline utilities services;
- 4) Assessment of available traffic infrastructure operators;
- 5) Disaster risks management applied by various level of governments.

The results of the questionnaire survey as summarized as follows:

- 1) Collection ratio (= Collected numbers divided by the total numbers of requesting)
 - ✓ Industrial Parks: 6/7 or 86%
 - ✓ Business Enterprises: 46/77 or 60% (both emails and telephone interviews)
 - ✓ Lifeline Utility Companies: 4/4 or 100%
 - ✓ Traffic Infrastructure Companies: 4/5 or 80%
 - ✓ Local Governments: 3/4 or 75%
 - 2) The reviews and reasons of the insufficient collection ratio

Industrial Parks:

- ✓ Questionnaires were sent out to seven industrial parks in Hai Phong including Nomura, VSIP, Trang Due, Dinh Vu, Nam Cau Kien and Trang Cat.
- ✓ All gave feedbacks except for Trang Cat. This IZ has organized the ground-breaking ceremony but there has not got any office or persons working there. Therefore, it is impossible to follow up and chase for the answer sheet.

Business Enterprises:

- ✓ Questionnaires were emailed to 54 tenants of Nomura Hai Phong Industrial Zone (NHIZ) through its Management Authority.
- \checkmark 23/54 enterprises answered; 17/54 refused to answer; others could not be contacted.

Lifeline Utility Companies:

- ✓ Questionnaires were sent to the main service providers in the four lifeline utility sectors including telecom, sewage, water supply and electricity supply
- \checkmark All of them responded.

Traffic Infrastructure Companies:

Questionnaires were sent to Hai Phong Railway Station, Hai Phong Port, Cat Bi Airport, Hai Phong Department of Transport and the Association of Transport Enterprises. Four of them responded. The Association of Transport Enterprises refused to answer because they found the questions not relevant to them.

Local Governments:

Questionnaires were sent to 5 local government agencies in Hai Phong including the Department of Dyke and Flood and Storm Management, Department of Transport, Department of Industry and Trade, Department of Information & Communication, and Department of Planning and Investment.

- \checkmark Four of them responded.
- ✓ The Steering Committee for Flood and Storm Management and Search and Rescue is in charge of the comprehensive disaster management in Hai Phong city but it is only an ad-hoc

organization. Meanwhile, the Secretary General of this Committee is also the Director of the Department of Dyke and Flood and Storm Management. So, the questionnaire was sent to him with the request for an answer sheet on behalf of both organizations.

✓ The Department of Planning and Investment refused to answer because they found the questions not relevant to them.

The answer sheet of the Department of Industry and Trade was submitted and summarized together with the group of traffic infrastructure companies because it relates closely to traffic infrastructure.

5.9.2 Reviews of the Questionnaire Surveys of Industrial Parks

The list of respondents is detailed as follows:

- 1) Nomura Hai Phong (NHIZ)
- 2) VSIP
- 3) Trang Due
- 4) Dinh Vu
- 5) Nam Cau Kien
- 6) Do Son

The following are the identifications from the questionnaire survey to the industrial parks.

1) The interruption of lifeline utility services and the causes of the interruption are summarized as follows:

Electricity supply:

Nomura Hai Phong Industrial Zone (NHIZ): Regarding the electricity supply from PC Hai Phong (or EVN Hai Phong) to NHIZ, in 2010, there were 12 interruptions but from 2011 up to now, there is only one stop. The average length of the stops is 45 minutes. The interruptions are usually caused by the problems at the substation of EVN. However, NHIZ confirmed that there is not any stop in the power supply to their tenants thanks to their own power plant.

Water supply:

Nomura Hai Phong Industrial Zone: NHIZ confirmed that there are many interruptions per year in the water supply from the city's system to NHIZ but each of them lasts just for a short time which does not affect on their operation. Such stops are often due to the broken water pipes. NHIZ also admitted that there was a stop in their internal water supply system, which lasted for 4 hours.

Sewerage:

According to NHIZ's record, there is no interruption in sewage services. It is also one of the four industrial parks which responded with the same answers. Others provided no information on this.

Telecommunication

According to NHIZ's record, there is no interruption in telecom services.

Urban gas:

No urban gas supply.

- Damages to roads and other traffic infrastructure caused by natural disasters are summarized as follows:
 - ✓ All respondents confirmed that there is not any experience in all direct roads to the industrial parks flooded simultaneously.

When being asked whether the incidents and natural disasters caused serious damages to the industrial parks, 33% of them answered "Yes" while 67% of them answered "No". Amongst other kinds of damages, there is internal inundation and fallen trees on the roads inside the industrial parks.

3) The following are the reviews on Business continuity in disasters:

When being asked about difficulties of business continuity in incidents or disasters, the concerns mainly focus on electricity cut-off and limited access to roads. They have no problems with the availability of their employees in case of disasters either.

Major requests with respect to disaster control measures:

The requests to either the local government or the lifeline utility or the traffic infrastructure focus mainly on better service qualities and improved infrastructures.





5.9.3 Reviews of the Questionnaire Surveys of Business Enterprises

The list of respondents in Nomura Hai Phong (NHIZ) is detailed in the following table:

NUMBER	NAME OF LOCATORS/BUSINESS FIRM
1	Synztec Vietnam
2	Tetsugen Vietnam
3	Tohoku Pioneer Vietnam
4	Toyota Boshoku Hai Phong
5	Vietnam Arai Co. Ltd
6	Vina-Bingo Co. Ltd.
7	Yanagawa Seiko Vietnam
8	Yoneda Vietnam
9	Johuku Hai Phong
10	PV Hai Phong
11	Korg Vietnam
12	EBA Machinery
13	Fuji Mold Vietnam
14	Fuji Seiko Vietnam
15	Toyoda Gossei Hai Phong
16	Iko Thompson Vietnam
17	Lihit Lab Vietnam Inc.
18	Nichias Hai Phong
19	Nishishiba Vietnam
20	Sougou Vietnam
21	Sumibubber Vietnam
22	Yazaki Hai Phong
23	Kokuyo Vietnam Co. Ltd.

Table 5.9.1	Locators	in NOMURA

Source: VIETBID (Local Consultant in Vietnam)

The following are the identifications from the questionnaire survey to the Business Entities in NHIZ.

- 1) The interruption of lifeline utility services and the causes of the interruption are summarized as follows:
 - ✓ The interruption of lifeline utility services

No comments because the questionnaires did not ask on this issue.

 $\checkmark\,$ Usual traffic infrastructure, roads and others

Most of the respondents use the National Road No. 5, Hai Phong Port and Noi Bai Airport as their usual traffic infrastructures. Cat Bi Airport is also a popular choice. Only one of them uses railway as the first choice for logistics.

✓ The alternatives for traffic infrastructure

- None of the respondents specified the names of alternative roads but they specified many alternative ports in Hai Phong and surrounding areas.
- Although railway seems not their usual traffic infrastructure but 50% of them choose it as the alternative for logistics. Disaster Prevention Plans, Business Continuity Plans and the concerns

Half of the respondents do not have long term or even annual disaster management plans or business continuity plans. They only make decisions on prevention measures case by case before the disasters depending on the warnings on the weather forecasts. Recovery measures are decided after they see the actual damages.



With regard to BCPs, some respondents, 13%,

answered "NA" instead of "No" because, in their minds, BCPs are integral parts of disaster management plans and, vice versa, disaster management plans are set up for business continuity purposes. In fact, they do not have disaster management plans and this fact implies that BCPs are not available in their organizations either.

The concerns and the difficulties with respect to the implementation of BCPs are various but unstable human resources and interruptions of infrastructure services are the notable ones. Some enterprises concern about the interruption of material supply which, in its turm, is also partly caused by the latter of the above.



The reasons why there are a lot of "NA" or "No" or "No ideas" answers may due to the 48% of no disaster risk management plans or BCPs in the above charts. Requests with respect to disaster control measures

- A significant number of respondents did not raise any requests.
- The requests, if any, are various but mainly emphasize on more efficient preventive measures and quicker reactions from the local governments and the infrastructure service providers.

5.9.4 Reviews of the Questionnaire Surveys of Lifeline Utility Companies

The list of respondents is detailed as follows:

1) VNPT Hai Phong

- 2) Hai Phong Sewage Company
- 3) Hai Phong Water Supply
- 4) Hai Phong Power company (PC Hai Phong or EVN Hai Phong)

The following are the identifications from the questionnaire survey to the Lifeline Utility Companies.

- 1) Objective and typical disaster for the disaster mitigation plan
 - ✓ Water supplier: flood, storm and pollution of water resources
 - ✓ Sewage operator: earthquake, flood, storm and storm surge
 - ✓ Electricity supplier: flood, storm and storm surge
 - $\checkmark\,$ Communication operator: flood, storm and storm surge
 - 2) Emergency supply
 - ✓ Electricity: All the respondents, except for the water supplier, have generators for emergency electricity supply.
 - ✓ Communication: All the respondents have emergency communication solutions for their own.
 - 3) Interruption of supply and the causes for the interruption
 - ✓ Water supplier: No interruption
 - ✓ Sewage operator: No interruption
 - ✓ Electricity supplier:

The power was interrupted on large areas during the Tornado in the Typhoon:

- No. 2 on 25 June 2011, Typhoons No. 3 on 30 July 2011 and No. 5 on 30 Sep in 2011
- No. 5 and 8 in 2012
- No. 5 in 2013

The reasons of the interruption were due to the strong winds and the floods. In most cases, the power supply was resumed very soon after the incidents. In some cases, the power supply was resumed after 24 to 48 hours.

✓ Communication operator:

There was an interruption during the Storm

• No. 8 in 2012 due to the strong wind and heavy rain.

However the interruption did not last for a long time or happened on a large area. It only happened with wire-line services on limited village areas only. Mobile telecommunication services were still ensured, so no effects on businesses.

4) Requests with respect to disaster control measures

To the local governments:

✓ Water supplier:

• Improve infrastructures, especially pumping stations, to prevent flood and inundation.

- ✓ Water sewage operator:
 - Construct additional pumping stations
- ✓ Electricity supplier:
 - No information
- ✓ Communication operator:
 - Improve capabilities of fighting against sea waves and storm surge for sea dykes and islands

To the lifeline utility services:

✓ Water supplier:

- Improve infrastructures, especially pumping stations, to prevent flood and inundation.
- Construct sea dikes to prevent the overflow of sea water due to sea level rises during typhoons.
- Ensure 24 hours/ 7 days electricity supply.
- ✓ Water sewage operator:
 - Ensue 24h/24h power supply to the pumping stations
- ✓ Electricity supplier: No information
- ✓ Communication operator:
 - Ensure the safety for the power grid
 - Strengthen the power supply capability during storms and heavy rains
 - Proper layout of power supply system/ transmission routes
 - No power cut-off on large areas at the same time
 - Quick restoration of communication cables when they are broken down by fallen trees.
 - To the traffic infrastructure services
- ✓ Water supplier:
 - Quicker licensing procedures for digging roads and pavements so that the repair of broken pipelines and recovery of water supply services can be completed as soon as possible after the incidents.
- ✓ Water sewage operator: No information
- ✓ Electricity supplier: No information
- ✓ Communication operator:
 - Ensure the safety for travelers during floods and inundations
 - Quick responses against traffic congestions due to fallen trees

5.9.5 Traffic Infrastructure Companies

The list of respondents is detailed as follows:

- 1) Hai Phong Railway Station
 - 2) Hai Phong Port
 - 3) Cat Bi Airport

4) Hai Phong Department of Transport

The following are the identifications from the questionnaire survey to the Traffic Infrastructure Companies.

- 1) Objective and typical disaster for the disaster mitigation plan
 - ✓ Road operator: Earthquake, flood, storm
 - ✓ Port operator: Earthquake, flood, storm and others (tornados, heavy rains, inundations, etc.)
 - ✓ Airport operator: Storm
 - ✓ Railway operator: Earthquake, flood, storm, storm surge and others, e.g. terrorism
 - 2) Emergency supply
 - ✓ Electricity: All the respondents, except for the railway operator, have their own generators for emergency electricity supply.
 - ✓ Communication: All the respondents have emergency communication solutions for their own.
 - 3) Interruption of supply and the causes for the interruption
 - ✓ Road operator: There was an interruption during the Storm No. 5 in 2013 when all offices on the ground floors of DOT's buildings were waterlogged. The waterlog lasted for 2 days due to the rising tides.
 - ✓ Port operator: No interruption.
 - ✓ Airport operator: No interruption.
 - ✓ Railway operator: There were interruptions during the following disasters:
 - ✓ The Typhoon No. 5 on 18 Aug. 2012
 - Reason: Trees fell down onto the railway section between Haiphong and Thuong Ly.
 - Duration: From 0.40 am to 2.50 am, 18 Aug 2012

The Typhoon on 28 and 29 Oct. 2012

- Reason: Trees fell down onto the railway section between Haiphong and Thuong Ly.
- Duration: From 2.15 am to 7.20 am, 29 Oct. 2012.

The big and prolonged rain on 29 and 30 Jun. 2013

- Hazard: Rainfall/ over 200 mm, rain duration/ 10 hours
- Reason: The railways in Haiphong Railway Station were seriously waterlogged. Duration: From 3.00 am to 7.30 am, 30 Jun 2013
- 4) Requests with respect to disaster control measures

To the local governments

- ✓ Road operator:
 - Funds for raising the base course of the yard and the ground floors of office buildings
 - Investments to prevent impacts of climate changes
- ✓ Port operator: No information
- ✓ Airport operator:

- Further supports and assistance in terms of technical equipment and human resources for disaster recovery.
- ✓ Railway operator:
 - More active supports and assistance to help Haiphong Railway Station overcome the disaster effects and recover the normal operation in the shortest period of time.

To the lifeline utility services

- ✓ Road operator:
 - Subterraneanize the lines and cables
- ✓ Port operator: No information
- ✓ Airport operator:
 - Ensure the uninterrupted supply so that Cat Bi Airport and other entities can recover the operations quickly after disasters.
- ✓ Railway operator:
 - Quick responses in environmental and electricity supply recovery

To the traffic infrastructure services

- ✓ Road operator:
 - Regulations on coordination amongst local authorities and lifeline utility companies when natural disasters occur
- ✓ Port operator: No information
- ✓ Airport operator:
 - Active and immediate supports and assistance in transportation of passengers and our staffs after disasters occur.
- ✓ Railway operator:
 - When traffic jams happen with the railway sector due to the natural disaster, there should be supports and coordination from other operators of transportation means such as busses and trucks to ensure the transportation of passengers and cargoes.

5.9.6 Reviews of the Questionnaire Surveys of Local Governments

The list of respondents is detailed as follows:

- Steering Committee for Flood and Storm Management and Search and Rescue of the city/ Hai Phong Department of Dyke and Flood and Storm Management
- 2) Hai Phong Department of Industry and Trade
- 3) Hai Phong Department of Information & Communication

The following are the identifications from the questionnaire survey to the

1) Objective and typical disaster for the disaster mitigation plan

All the respondents answered that flood, storm/ storm surge and tsunami are treated in their disaster mitigation plans. Earthquakes are considered in two third of the plans. Some other disasters such as tornado, low tropical pressure and oil spill are also covered.

2) Objective and typical disaster for the damage prediction

Similar to the above, earthquake, flood, storm/ storm surge and some other disasters such as low tropical pressure, tsunami, tornado, etc. are treated in their damage prediction.

- 3) Response in disaster for residents
 - ✓ Educate and improve residents' awareness on possible effects of natural disasters and how to prevent and mitigate them ------ 1
 - ✓ Provide warnings on areas which are in danger of being hit by natural disasters-----1
 - ✓ Evacuate residents and Secure evacuate houses-----3
 - ✓ Provide temporary shelters/ toilets-----3
 - ✓ Search and rescue ----- 1
 - ✓ Provide financial supports to effected households ----- 1
- Response in disaster for companies on recovery of lifeline utility or traffic infrastructure

All the respondents answered that they have policies to give priorities to companies about recovery of lifeline utilities or traffic infrastructure.



5) Response in disaster on financial supports

According to the survey results, no financial supports from the central governments or other authorities are provided to enterprises for disaster recovery.



6) Damages from disaster to the operation of local governments

The only damage recorded is the interruption of services due to damages of infrastructures.

7) Information on hazards/risks open to the public

According to the respondents, the information on hazards/risks open to the public includes deaths, injuries and damages to infrastructures, production and trading, etc.

8) The requests with respect to disaster control measures

To the local governments

- ✓ Two third of the respondents expressed that they would like to be provided with more dedicated search and rescue forces and more equipment to facilitate their work.
- \checkmark More investments and budgets are also the main requests.

To the lifeline utility services

- ✓ For lifeline utility services, as other service users, the local government bodies also emphasizes on requesting for better service qualities and quicker reactions on disaster recovery, especially the continuity of electricity supply to facilitate the local government's operation in emergency cases.
- ✓ Regular training for their staffs and workers is also strongly requested.

To the traffic infrastructure services

- ✓ 50% of the respondent local government bodies requested the traffic infrastructure operators to have good preparations for efficient and quick recovery in disasters to ensure the uninterruption of their services.
- \checkmark 50% of them did not raise any requests.

5.10 Response to Typhoon No. 5 : Tropical Storm JEBI and other Typhoon

5.10.1 Introduction

During the 3rd mission from July 28th to August 10th, 2013, Typhoon No. 5 : Tropical Sotrm JEBI (August 2013) and Typhoon No. 6 : Tropical Storm MANGKHUT (August 2013) have occured. The City of Hai Phong established Hai Phong Committee for Flood and Storm Control (Hai Phong CFF&SC) to respond flood and typhoon by advising proactive measures and evacuation advisories, providing typhoon information and conducting damage investigations. In this report, the Sutdy Team summarized 1) specification of each Tyhoon, and 2) disaster prevension measures applied by Hai Phong CFF&SC, public sectors, private sectors and industrial estates. Target Typhoons are JEBI, MANGKHUT, as well as the past typhoons which brought severe damages to Hai Phong, namely Typhoon No. 2 : BEBINCA (June 2013) and Typhoon No. 8 : SON TIHN (October 2012).

5.10.2 Specification of Typhoon No. 5 : JEBI (2013)

On July 29th, 2013, Typhoon No. 5 occured as a tropical storm in the South Chian Sea. It moved toward northwest direction with increasing its strength, then the tropical strom became typhoon on July 31st. From August 2nd noon to 3rd early morning, Typhoon JEBI reached to the maximum wind speed of 25 m/s. After landing in the City of Hai Phong, it weekend into a tropical cyclone before disappearing on the 4th. The route and specification of Typhoon No. 5 are summarized below.



Figure 5.10.1 Route of Typhoon No. 5 : JEBI

Reference : Japan Meteorological Agency http://www.jma.go.jp/jma/indexe.html

Date (Ja	e/Time ipan)	Positio	n Centre	Central Pressure	Max sustained Wind Speed	Strom Area (radius)	Strong Wind Area (radius)		Size	Strength		
M	DТ	Ν	E	hPa	m/s	km		kr	n			
7	29 03	13.1 N	123.3 E	1006							Tropical Cyclo	ne Developped
	09	13.2	122.4	1008								
	15	13.4	121.6	1006								
	21	13.6	120.9	1006								
	30 03	13.7	120.1	1004								
	09	13.8	119.5	1004								
	15	14.0	118.4	1002								
	21	14.3	117.5	1002								
	31 03	14.6	117.0	1002								
	09	14.7	116.3	1000	18			220				
	15	14.8	115.7	998	18			220				
	21	15.1	115.0	994	18			330				
8	1 03	15.3	114.5	994	18		SE:	460	NW:	280		
	09	15.6	113.8	994	18		SE:	460	NW:	280		
	15	16.1	113.5	994	18		SE:	460	NW:	280		
	21	16.4	113.2	992	20		SE:	460	NW:	280		
	2 03	16.8	112.8	990	20		SE:	460	NW:	280		
	09	17.7	112.5	990	20		SE:	330	NW:	220		
	15	18.8	111.8	985	25		SE:	330	NW:	220		
	21	19.7	111.1	985	25		SE:	330	NW:	220		
	3 03	20.3	109.4	985	25		SE:	330	NW:	190		
	09	21.0	107.9	985	25		E:	330	W:	190		
	15	21.6	106.5	990	20		E:	280	W:	170		
	21	22.0	104.5	998							Cahged to Tro	opical Cyclone
	4 03										Disa	opear

 Table 5.10.1
 Location Chart of Typhoon No. 5^{*1}: JEBI

*1: Japan Meteorological Agency named as Typhoon No. 9

Reference : Japan Meteorological Agency http://www.jma.go.jp/jma/indexe.html

5.10.3 Observation Record in the City of Hai Phong: Typhoon No. 5 JEBI (2013)

According to Hai Phong CFF&SC (Hai Phong CFF&SC, August 2013), at 4:00 AM on August 3rd, the center of Typhoon No. 5 was located at 20.6°N ; 108.7°E 180 km east-southeast from Quang Ninh-Nam Dinh coast with the maximum wind speed of Level 10 (24.5 - 28.4 m/s). Coastal areas from Auang Ninh province to Nam Dinh were warned for rising sea levels combined with high tides.

5.10.4 Recorded Damages in the City of Hai Phong: Typhoon No.5 JEBI (2013)

There was no report on accident, inundation and casualty due to Typhoon No.5. The main damage among records is a breakage and damage of infrastructure facilities, including the roof damage to the office and residence, fire caused by electrical problems and agriculture-aquaculture damages. The recorded damages were over a wide area from the coast to inland. Hai Phong CFF&SC (Hai Phong CFF&SC, August 2013) summarized damages caused by Typhoon No. 5 as shown in Table 5.10.3

Table 5.10.2Accident and Inundation DamagesTable 5.10.3

Table 5.10.2 and Table 5.10.3

Table 5.10.2	Accident and Inundation	Damages
10010 011012		

<u>Item</u>	Condition	<u>Remarks</u>
<u>Accident</u>	None	None
Inundation	No Major Inundation	None

Reference: Hai Phong CFF&SC, August 2013

Item	Condition/Location	<u>Remarks</u>
<u>Human Life</u>	No Casualty	None
Dyke • Irrigation Structure	No Major Damage	- Erosion: Part of dyke (Vinh Bao) along No.17 Road
Residence	Kien An Area	 <u>30m²: Roof damaged</u> <u>150m² : Fire by electrical problem</u>
	An Duong	- <u>100m²</u> : Office roof damaged
	<u>Cat Hai</u>	- <u>Roof damaged</u>
Agriculture •	<u>An Duon and Cat</u> Hai	- Farmland damaged: Approx. 50 hectors
	<u>Cat Hai</u>	- <u>Aquaculture cage damaged</u>
<u>Infrastructure</u>	<u>Cat Ba</u>	 <u>Damages along No.356 Road</u> <u>Balcony damaged at Cat Ba Road Station,</u> <u>fallen tree (35 trees)</u>, dyke damaged (15m)
	=	 <u>Sidewalk surface loosened : 30m²</u> <u>Road depression : 20m²</u> <u>Road Sign collapse : 2 signs</u>
	Beach Long Vy	- <u>VHF antenna broken</u>
	Long Phu Commune	- <u>35KV line cut</u>
	Hien Hao	- <u>Transformer line cut</u>

Commune, Cat Hai

Reference: Hai Phong CFF&SC, August 2013

5.10.5 Response to Typhoon No. 5: JEBI (2013)

Data collection was conducted on the responses of each stakeholder including governmental agencies, private companies and locals to typhoon. The methodologies are (1) governmental official report (Hai Phong CFF&SC, August 2013) and (2) interviews with locals. The governmental official report described the responses of the central government and the City of Hai Phong (CFF&SC) to the Typhoon No.5. From the report, the method and timing of official orders/instructions are organized in chronological sequence in Table 5.10.4. The interviews were conducted with people of commercial facilities and Nomura Hai Phong Industrial Park Management office and tenants.

According to Hai Phong CFF&SC report, on August 1st (2 days before the Typhoon landed in the City of Hai Phong), the central government sent emergency telegram (No.05/CD-CT) to related agencies and units requesting for the implementation of prevention measures. In response to the telegrams, the local government, Hai Phong CFF&SC, sent a telegram (No. 07/CD-CFF&SC) to local public agencies and units in order to convey the national government's order on implementation of prevention measures.

The local reported during the hearing investigation at Do Son area that, on August 1st (on the same day the telegrams were sent out), they also received the typhoon information and warnings from the local government. The prevention measures implemented by locals are moving boats to safer places, removal of lantern decorations at Cat Ba area, removal of large signs of restaurants/hotels at coastal areas and covering windows and entrance facing the sea by using plywood at Do Son Area.

As for the activities of central and local government, officials held meetings and field investigation for gathering supplemental information, and issued evacuation order and offshore fishing ban. The local government also ordered the military mobilization (100 members) for placing a prevention measure to the coast line at Do Son Tourist Park which was severely eroded by previous typhoons (CFF&SC supplied reinforced material).

On the other hand, on August 2nd, the tenants of industrial park, particularly foreign-affiliated companies received typhoon information and warnings from the embassy of their country and the Industrial Park management office. With the information, they conducted internal discussion on prevention measures. It must be noted that throughout the typhoon period, they did not receive information from the central and local government agencies. It is recommended that the current system or means for transmitting information/warning on natural disaster must be improved to provide accurate and timely warnings to stakeholder including private companies.

Date	Central Government ^{*1}	The City of Hai Phong ^{*1}	Private Sector	Indus trial Estate
	Unknown	14:30	Unknown (interviewed info at Do Son Area on August 3):	
1-Aug	 Emergency Telegraph (ET) (No. 05/CD-CT): requested sectors and units to implement prevention measures. 	 - CFF&SC ET (No.07/CD-CFF&SC): Direct sectors to monitor conditions, gather information, limit the vessel operation, prohibit offshore boats activities, keep regular contact with boat owners, implement safety plan to protect dykes, irrigation, drainage system, agriculture, livestock, fisheries and manufacturing facilities, warehouse and docks, order maintenance and rescue as required. 	 Local people at Do Son area received typhoon information from local government. 	
	PM - Hai Phong CFF&FC mtg. (chairman: Chairman of Pe - Delegates inspected prevention measures at Cat hai.)	pple's Committee (PC): assigned CFF & SC members to inspect to Son, Duong Kinh, Kien Thuy, Thuy Nguyen, Tien Lang, Vinh		
	MA	17:00	Unknown (interviewed info at Do Son Area on August 3):	Unknown (interviewed info at Nomura Hai Phong IZ on August 5)
	- Chairman of PC inspected prevention measures at major regions.	 Hai Phong CFF&SC prohibited the offshore fishing and operated rescue vessels CN09. 		
		17:30	- Start moving boats to safe place.	 Obtained Typhoon Information (weather map) from the Embassy of Japan and the management office of Nomura Hai Phong IZ.
2-Aug		- <u>HPai Phong CFF&SC ET (No.09/CD-PCLB&TKCN):</u> ordered to implement ETs No.05/CD-CT and No.06/TB- PCLB&TKCN.	 - Removal of lantem decorations at Cat Ba area. Removal of large signs of restaurants and hotek at coastal areas. Begin to cover windows and entrance facing the sea by using plywood at Do Son area. 	
		 Determined to evacuate entire residents at warning area (outside the dykes, critical area, aquaculture are) before 7 am on August 3, 2013, ordered to implement measures to agriculture lowland. 		
	Unknown - The Ministry of Military Commander mobilized 100 offreers and Hai Phong CFF&SC supplied 500 steel gabion, 1200 m ³ riprap, 50 kg steel wire, 50 pliers to reinforced embankment at Do Son tourist area.	Inspected safety of operation of tide and sewer system.		
		Typhoon No. 5 landed in the City of Hai Phong		
August 3	Morning: Chairman of PC and CFF&SC members site	Tsit (Do Son) or CEER. CO. "DEDDDT' Descention and control and montes to D	Tronical Gram IEBI? Damla's Committee of Hai Dhone ?	No. / BC DCI B&TVCN Aumict 2013
Kelel	rence: *1 Hai Phong Committee for Flood and Morth Control (ria rite	g CFF&SC), "KEPUK1: Prevention and control and recover works response to	I ropical Storm JEBI , reopie s committee of rial rhong, 1	No.: /BC-PCLB&IKCN, August 2015

5.10.6 Results of Field Survey on Typhoon No. 5: JEBI (2013)

The Study Team conducted a two day field survey: 1) on August 2^{nd} before typhoon and 2) August 3^{rd} after typhoon. The survey on August 2^{nd} included the investigation of evacuation situation and preventative measures within the City of Hai Phong and at the Cat Bi Airport. The survey after typhoon on August 3^{rd} focused on a damage investigation within the City of Hai Phong and at the Do Son Area. The main survey points are shown in Figure 5.10.2.



Figure 5.10.3 Location Map of Field Survey

(1) Before Typhoon: August 2nd Afternoon

In the City of Hai Phong, most of shops were already closed and there was less traffic as compared to the usual condition. It was noted that the preparation to typhoon was underway.



Photo 5.10.1 Looking at the City of Hai Phong



Photo 5.10.2 Street in front of Nam Cuong Hotel in the City of Hai Phong before arrival of typhoon. Much fewer traffic as compared to the usual condition.



Photo 5.10.3 Hai Phong Cat Bi Airport

(2) After Typhoon: August 3rd Afternoon

The observed damages at Do Son area include coastal dyke damages at few locations (unknown if they were caused by Typhoon No. 5). In the afternoon of August 3rd, people were out cleaning the aftermath of the typhoon and removing plywood which was used to protect the commercial facilities (restaurants and hotels) located along a road facing the South China Sea. At a dock, as a typhoon measures, boats were tied to trees along embankment.

Within the city of Hai Phong, inundations caused by inland water were recorded, especially along major roads and lowlands (university campus). However, the investigation from the Bin Bridge across the Cam River indicated that there was no damage along the river.

(3) September 3, 2013



Photo 5.10.4 Coastal dyke damaged at Do Son Area (Unknown if the damage caused by Typhoon No. 5 JEBI:JEBI(2013))



Photo 5.10.5 People cleaning the aftermath of typhoon and removing plywood used to protect doors and windows.



Photo 5.10.6 Coastal dyke damaged at Do Son Area (Unknown if the damage caused by Typhoon No. 5 JEBI:JEBI(2013))



Photo 5.10.7 Prevention measures to protect boats by strapping to trees along embankment at Do Son area



Photo 5.10.8 Inundation in the City of Hai Phong



Photo 5.10.9 University Campus Inundated in the City of Hai Phong



Photo 5.10.10 Looking downstream from a commercial port (tour boats for Catba island) located on right bank of Cam River



Photo 5.10.11 Looking downstream of the Cam River from the Bin Bridge

(4) Summary of Typhoon No. 6: MANGKHUT (2013)

On August 5th, 2013, Typhoon No. 6 occurred as a tropical storm in the South China Sea. It moved toward northwest direction with increasing its strength, and then on the 6th the tropical storm became Typhoon. From August 7th morning to evening, Typhoon MANGKHUT reached to the maximum wind speed of 20 m/s. After landing in Northern Viet Nam, it weakened into a tropical cyclone before disappearing on the 8th morning. According to reports by local media, there was no significant damage caused by the Typhoon MANGKHUT. The route and specification of Typhoon No. 6 are summarized below.



Figure 5.10.4 Route of Typhoon No. 6 : MANGKHUT Reference : Japan Meteorological Agency http://www.jma.go.jp/jma/indexe.html

stence . Japan Meteorological Agency <u>http://www.jma.go.jp/jma/muexe.</u>

Date/Time (Japan)	Position	Centre	Central Pressure	Max sustained Wind Speed	Strom Area (radius)	Strong Wind Area (radius)	Size	Strength
MDT	N	E	hPa	m/s	km	km		
8 5 09	10.7 N	117.7 E	1006				ropical Cyclor	ne Developpe
15	11.4	116.9	1004					
21	12.0	115.5	1004					
6 03	13.1	113.5	1004					
09	14.0	112.8	1002					
15	15.1	111.8	1002					
21	15.8	110.8	998	18		220		
7 03	17.1	109.5	996	18		220		
09	18.1	108.3	994	20		220		
15	18.7	106.8	992	20		220		
21	19.0	106.4	994	20		220		
8 03	19.7	105.4	996	18		E: 220 W: 150		
09	20.0	104.2	1000				ahged to Tro	pical Cyclon
15							Disa	opear

 Table 5.10.6
 Location Chart of Typhoon No. 6^{*2} : MANGKHUT

*2: Japan Meteorological Agency named as Typhoon No. 10

Reference : Japan Meteorological Agency http://www.jma.go.jp/jma/indexe.html

5.10.7 Summary of Typhoon No. 2 : BEBINCA (2013)

On June 20th, 2013, Typhoon No. 2 occurred as a tropical storm in the South China Sea. It moved toward northwest direction with increasing its strength, and then changed to typhoon on the 21st. From June 22nd morning to 23rd dawn, Typhoon BEBINCA reached to the maximum wind speed of 20 m/s. After landing in Northern Viet Nam on the 23rd midnight, it weakened into a tropical cyclone on the 24th noon before disappearing. The route and specification of Typhoon No. 2 are summarized below.



Figure 5.10.5 Route of Typhoon No. 2 : BEBINCA

Reference : Japan Meteorological Agency http://www.jma.go.jp/jma/indexe.html

Date/Time (Japan)	Positio	n Centre	Central Pressure	Max sustained Wind Speed	Strom Area (radius)	Strong V (rad	Vind Ai dius)	rea	Size	Strength
MDT	Ν	E	hPa	m/s	km	k	m			
6 20 03	14.8 N	116.9 E	1002						opical Cyclor	ne Developpe
09	15.7	117.4	1002							
15	16.4	117.6	1000							
21	7.2	117.4	1000							
21 03	17.6	116.8	998	18		E: 220	W:	190		
09	18.0	116.2	998	18		E: 220	W:	190		
15	18.4	115.5	996	18		E: 280	W:	220		
21	18.8	114.3	996	18		E: 280	W:	220		
22 03	19.2	112.8	994	18		E: 280	W:	220		
09	19.2	111.4	990	20		E: 280	W:	220		
15	19.1	110.2	990	20		E: 280	W:	220		
21	19.0	108.7	990	20		SE: 280	NW:	220		
23 03	19.2	107.8	992	20		E: 280	W:	220		
09	19.3	107.3	992	18		220				
15	19.8	107.0	994	18		220				
21	20.4	106.6	994	18		220				
24 03	20.7	106.4	996	18		220				
09	21.0	106.4	998	18		190				
15	21.6	106.6	1000						ahged to Tro	pical Cyclon
21									Disa	ppear

Table 5.10.7Location Chart of Typhoon No. 2 *3 : BEBINCA

*3: Japan Meteorological Agency named as Typhoon No. 5

Reference : Japan Meteorological Agency http://www.jma.go.jp/jma/indexe.html

According to Hai Phong CFF&SC (Hai Phong CCF&SC, June 2013), at the evening of June 23rd, Typhoon No. 2 landed Hai Phong-Thai Binh with strong wind speeds at the level 8 (17.2-20.7 m/s). High tide on June 23rd (at 5:5 PM: 3.6 m) with strong winds caused rising water level over 4m at Do Son and Cat Hai.

Financial loss caused by Typhoon No. 2 (Hai Phong CCF&SC, June 2013) was estimated approximately 395,71 billion VND. The main loss and damages are evacuation (more than 1,800 people from Cat Hai Area, Do Son Area and other Area), Inundated house (1,500 houses at Do Son area), house collapsed and swept away (4 houses), livestock mortality (cattle: 180 cattle, other : 2,650 livestock), salt damage of farmland and grazing land, dyke and embankment damage (4,048m), slid embankment at Cat Ba (167m), slide coast dyke and area at Do Son tourist area (433,65m³), national highways, provincial and rural roads damaged/inundate, and electrical poles/lines/substation damaged.

5.10.8 Summary of Typhoon No. 8 : SON TINH (2012)

On October 21st, 2012, Typhoon No. 8 occurred as a tropical storm in the South China Sea. It moved toward northwest direction with increasing its strength, and then changed to typhoon on the 23rd. Typhoon No.8 recorded the maximum wind speed at 45 m/s on the 27th. After landing in



Northern Viet Nam on the 28th noon, it weakened into a tropical cyclone before disappearing. The route and specification of Typhoon No. 8 are summarized below.

Reference : Japan Meteorological Agency http://www.jma.go.jp/jma/indexe.html

Figure 5.10.6 Route of Typhoon No. 8 : SON TINH

Date/Time (Japan)	Position	Centre	Central Pressure	Max sustained Wind Speed	Strom Area (radius)	Strong Wind Area (radius)	Size	Strength
MDT	Ν	E	hPa	m/s	km	km		
10 21 21	6.4 N	135.0 E	1008				Tropical Cycl	one Developped
22 03	6.9	133.7	1004					
09	7.4	133.4	1006					
15	8.0	132.7	1004					
21	8.6	131.9	1004					
23 03	8.8	131.0	1004					
09	8.4	130.0	1004					
15	8.0	128.9	1000					
21	8.3	128.1	1000	18		280		
24 03	8.8	127.5	998	18		280		
09	10.0	126.3	998	18		280		
15	10.8	124.9	996	18		280		
21	11.4	123.9	998	18		280		
25 03	11.9	122.3	996	20		390		
09	12.8	120.9	998	20		390		
15	14.0	119.6	998	20		390		
21	14.4	117.6	998	20		390		
26 03	14.4	116.8	996	20		390		
09	14.6	115.6	990	23		390		
15	14.9	114.8	980	30	90	390		
21	15.5	113.6	980	30	90	390		
27 03	16.1	112.2	975	30	90	390		
09	16.5	111.0	975	30	90	390		
15	17.0	109.7	965	35	110	390		Strong
21	17.5	108.9	945	45	110	390		Very Strong
28 03	18.1	107.8	955	40	110	390		Strong
09	18.4	107.5	955	40	110	390		Strong
15	19.2	107.1	970	35	110	330		Strong
21	19.8	106.7	980	30	110	280		
29 03	20.7	106.6	990	23		280		
09	21.3	107.0	1004	18		220		
15	21.5	107.1	1008				Cahged to T	ropical Cyclone
21	21.8	107.6	1008					
30 03							Dis	appear

Table 5.10.8	Location Chart of Typhoon No. 8 ^{*4}	: SON TINH
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*4: Japan Meteorological Agency named as Typhoon No. 23

Reference : Japan Meteorological Agency http://www.jma.go.jp/jma/indexe.html

Hai Phong CFF&SC (Hai Phong CCF&SC, November 2012) reported that Typhoon No. 8 had strong intensity, and landed in Hai Phong from evening of the 28th to dawn of the 29th. It recorded the strong wind speeds at the level 11 (24.5-28.4 m/s) – Level 12(28.5-32.6 m/s), caused heavy rain at whole city with total rainfall from 300 to 350 mm.

The total value of damaged assets (Hai Phong CCF&SC, November 2012) was estimated to 997,395 billion VND. Major damages and losses are victims (2 deaths, 9 injured), rescued victims (56 people), house collapsed (136 house), lost roof (house: 10,621, business building: 125, farm: 1,584, temporary housing: 536), agriculture damage (rice field: 8,433ha, crops damaged: 5,604ha,

aquaculture areas: 3,943ha), livestock mortality (cattle/chicken: 202,937 head), tree collapsed (209,976 tree), electric poles broke (863 poles), electric line cut (83line), port damaged (4 ports), bridge/gauging station damage (8 stations), dyke damage (Cat Hai Dyke, Thai Binh Right Dyke, Thai Binh Left Dyke, Van Uc Left Dyke, Luoc River Right Dyke), and coast dyke eroded at Do Son tourist area (1,200m).

5.10.9 Conclusion

During the 3rd mission, Typhoon No. 5: Tropical Storm JEBI (August 2013) and Typhoon No. 6: Tropical Storm MANGKHUT (August 2013) occurred. JICA Study Team conducted field survey and gathered related information to investigate the damages and losses caused by Typhoon No. 5 and summarized the general description of each typhoon and the prevention measures and responses taken by the related agencies. As for other past typhoons which caused severe damages and losses to the city of Hai Phong, the Study Team gathered information through the relevant government agencies and summarized specifications, route and damages of each typhoon.

It was found that, all four typhoons (JEBI, MANGKHUT, BEBINCA and SON TINH) demonstrated a number of similarities that (1) it appeared in Pacific Ocean or the South China Sea located southeast of the City of Hai Phong, and (2) It reached the maximum wind speed before landing in the city of Hai Phong or in the Northern Viet Na, then soon weakened into a tropical cyclone and disappeared. Typhoon No. 8 SON TINH in 2012 was the largest among the investigated typhoons in terms of the total value of damaged assets, wind speed, and radius of strong wind zone.

In response to the investigation through the governmental official report (Hai Phong CFF&SC, August 2013) and hearing investigation with locals, it was found that the local residents received telegrams issued by central and local government and are informed regarding the description of the typhoon and actions to be taken in a timely manner. On the other hand, the source of typhoon information and warnings for the tenants of industrial park, particularly foreign-affiliated companies, was mainly the embassy of their country and the Industrial Park management office; they did not receive information from the central and local government agencies. It is recommended that the current system or means for transmitting information/warning on natural disaster must be improved to provide accurate and timely warnings to every stakeholder including private companies.

In addition, the field survey confirmed that damages and loses caused by typhoons were not only regionally but also spread through a wide area. At the coast, coast dykes were severely damaged and collapsed, whereas the city life was interrupted by inland inundation at lowland and collapsed trees along major roads. In addition, the City of Hai Phong has many major infrastructures (ports, station, airport and highways) located within the city, regional inundation or collapsed trees could temporarily suspend or cut the important distribution network and roads which may lead large

economic loss. Therefore, even when the abnormal condition that affects the entire region occurs, it is important to maintain and early recovery of function particularly in the industrial areas.

It is recommended that local governments, infrastructure providers and private companies within the region to develop and have disaster prevention measures as well as BPC. Also the findings of the investigation reveal the importance of development of Area-BCP which can be used for understanding and sharing important information among every stakeholder at timely manner. Area-BCP could be also beneficial for strengthening the capacity of means for transmitting information between local government and private companies.

References:

- Hai Phong Committee for Flood and Storm Control (Hai Phong CFF & SC), "REPORT: Prevention and control and recover works response to Tropical Storm JEBI", People's Committee of Hai Phong, No.: /BC-PCLB&TKCN, August 2013
- 2) Hai Phong Committee for Flood and Storm Control (Hai Phong CFF & SC), "REPORT: Prevention and control and remediation to Storm No.2", People's Committee of Hai Phong, No.: /BC-PCLB&TKCN, June 2013

Hai Phong Committee for Flood and Storm Control (Hai Phong CFF & SC), "REPORT: Prevention and control and remediation to Storm No.8", People's Committee of Hai Phong, No.: /BC-PCLB&TKCN, November 2012

Annex

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Annex 1




INDONESIA WORKING GROUP MEETING

Thursday, 22 August 2013, Hyatt Regency Bandung, West Java, Indonesia

MEETING AGENDA				
09.30-10.00	Registration			
10.00-10.05	Welcome Address	MC		
10.05-10.30	Opening Address • Speech from JICA Jakarta • Speech from BPBD West Jawa • Speech and opening from BAPPEDA West Jawa	Mr. Norio Matsuda Mr. Ahmad Mulyadi Mr. Husen Ahmad	Moderator: Krishna S. Pribadi MC: Lina (BAPPEDA West	
10.30-11.00	Introduction of the Project, the Pilot Study in Indonesia and Composition of Working Group	Dr. Masakazu Takahashi Study Team Leader	Jawa)	
11.00-11.20	Q & A			
11:20-11:30	Coffee Break			
11.30-12.00	Natural Disaster Risk Assessment for Area BCP	Mr. Shukyo Segawa Leader of Natural Disaster Risk Assessment		
12.00-12.20	Q & A			
12:20-13:30	Lunch			
13:30-14.10	Introduction of BCP and Area BCP and Method of Area BCP Formulation	Mr. Yoshiki Kinehara Area BCP		
14.10-14.30	Q & A			
14.30-14.50	Plan of the Future Workshops	Dr. Masakazu Takahashi		
14.50-15.00	Closing Remarks	BAPPEDA West Jawa		
15:00	Adjournment			





"NATURAL DISASTER RISK ASSESSMENT AND AREA BUSINESS CONTINUITY PLAN FORMULATION FOR INDUSTRIAL AGGLOMERATED AREAS IN THE ASEAN REGION" INDONESIA WORKING GROUP MEETING

August 22, 2013, Hyatt Regency Bandung, Bandung, West Java, Indonesia

List of Participants

Classification / Sector	Organization	Name
Local West Java	Ť	Ir. Husain Achmad, MM
Government Provincial		Dudi Ahmad Faisal
Government	BAPPEDA West Java (Working Group Leader)	Ichary Soekirno
Units		R. Dewi Lestari
		Lina Yulianty, S.T., M.T
		Widhy Kurniatin, S.T., M.Si
		Ir. Gatot M. Sudrajat, M.Sc
		Ahmad Mulyadi
		Hersuparyoto
	BPBD West Java (Working Group Secretariat)	M. Ridwan
		Erna Ermilia
		Rachmadi
		Andi Sukandi
	Provincial Transportation Agency (DISHUB)	Agus Pribadi
	Provincial Industry and Commerce Agency	Ida Rohayah
	(Dinas Perindustrian dan Perdagangan)	Ismarvati
Provincial Police	Jakarta Greater Metropolitan Police (POLDA	Iputu Sumada
and Military	Metro Jaya)	I
Command	West Java Military Territorial Command (KODAM III Siliwangi)	Kolif Arif M.
Karawang		Agustien N
Regency	BAPPEDA Karawang Regency	Dindin Rachmadhy
Government	Transportation, Communication, and Informatics Agency (DISHUBKOMINFO)	Iwan Kristiawan
Units		Setia Dharma
	Karawang	
	Natural Environment Management Agency	Ade Setiawan
	(BPLH) Karawang	Agung Nugraha
	Social Affairs Agency (Dinsos) Karawang	Supriatna
Bekasi Regency	BAPPEDA Bekasi Regency	Pipit Septi
Government		E.Y. Taufik
Units		Reri Hidayat
		Otang
	BPBD Bekasi Regency	Heri Yuniadi
		Agus Zulkarnain
	Transportation Aganese (DISHUB) Bokasi	Koencoro Oemaryadi
	Regency	Saripudin A.S
	Negency	A. Rahman S.
	Fire Brigade Agency (DAMKAR) Bekasi Regency	Shobirin
Bekasi City	BAPPEDA Bekasi City	Dadang M
Government		Dadang M.
Units	Industry and Commerce Agency	Agus Taufik
	Industry and Commerce Agency (Disperindagtamben) Bekasi City	Agus Taufik Yono
	Industry and Commerce Agency (Disperindagtamben) Bekasi City Road and Water Management Agency	Agus Taufik Yono Berryan AUJ
	Industry and Commerce Agency (Disperindagtamben) Bekasi City Road and Water Management Agency (Disbimarta) Bekasi City	Agus Taufik Yono Berryan AUJ Idi Sutanto
Infrastructure Road and	Industry and Commerce Agency (Disperindagtamben) Bekasi City Road and Water Management Agency (Disbimarta) Bekasi City PT. Jasa Marga (Indonesia Highway	Agus Taufik Yono Berryan AUJ Idi Sutanto Cecep Sadeli
InfrastructureRoad andOperatorHighway	Industry and Commerce Agency (Disperindagtamben) Bekasi City Road and Water Management Agency (Disbimarta) Bekasi City PT. Jasa Marga (Indonesia Highway Corporation) Jakarta	Agus Taufik Yono Berryan AUJ Idi Sutanto Cecep Sadeli
InfrastructureRoad andOperatorHighway	Industry and Commerce Agency (Disperindagtamben) Bekasi City Road and Water Management Agency (Disbimarta) Bekasi City PT. Jasa Marga (Indonesia Highway Corporation) Jakarta Road and Highway Agency (BINA MARGA)	Agus Taufik Yono Berryan AUJ Idi Sutanto Cecep Sadeli H. Anang
Infrastructure Road and Operator Highway	Industry and Commerce Agency (Disperindagtamben) Bekasi City Road and Water Management Agency (Disbimarta) Bekasi City PT. Jasa Marga (Indonesia Highway Corporation) Jakarta Road and Highway Agency (BINA MARGA) Karawang	Agus Taufik Yono Berryan AUJ Idi Sutanto Cecep Sadeli H. Anang Dudi

Lifeline Utility	Electricity	PLN Dist. West Jawa and Banten	Hadi Suhana
Operator			Uun Wariyanti
	Water Resource	Citarum River Region Agency (BBWS	M.Ruchimat
		Citarum)	Thova Magnolia
		Perum Jasa Tirta II Karawang (PJT II)	Reni Mayasari
		Karawang District Water Company (PDAM	Suharna
		Karawang)	Agung R.
		Bekasi City Water Company (PDAM Kota	Aruji Kartawindan
		Bekasi)	Maman Sudarman, S.E
	Telephone and	PT.TELKOM Karawang	Tata Casnita
	Communication		Idul Kurnia
			M.Sobar
		PT.TELKOM Bekasi	Idris Sardi
Research		Ministry of Energy and Mineral Resources	Agus Budianto
Institution		(KESDM) Geological Division	
Private Sector	Private Company	PT Toyota Astra Motor Indonesia	Purwoko Dani R.
	Industrial Park	Karawang International Industry City (KIIC)	Irwansyah
		MM2100 Industrial Town Bekasi	Darwoto
	Association	The Employers' Association of Indonesia	Rudi Martono
		(APINDO) West Jawa	Nandayani

Indonesia Working Group Meeting Thursday, 22nd August 2013 Hyatt Regency Hotel, Bandung

Time: 09.30 - 15.00Moderator: Mr. Khrisna S. Pribadi

A. PREFACE

Opening Remarks by Mr. Norio Masuda - JICA

Japan is country with high susceptibility to disasters. Japan has experienced catastrophes which affected government and business sectors. The affected business sectors, from large and small scales, were not able to conduct their operational activities. As disaster risk reduction is considered important in business sectors, JICA intends to conduct Natural Disaster Risk Assessment in Industrial Areas (BCP & ABCP). Data collection for the study is also conducted being held in Phillipine, Vietnam, and Indonesia. BCP (Business Continuity Plan) and ABCP (Area Business Continuity Plan) are considered as new concepts, and novel breakthrough.

Opening Remarks by Mr. Ahmad Mulyadi BPBD of West Java Province

General description of Karawang and Bekasi regency, which related to altitude, rainfall, and other geographical conditions.

Opening Remarks by Mr. Husen Ahmad Bappeda of West Java Province

Description on the study significance for West Java Province, as Bekasi and Karawang are located within the region; and they are the most strategic industrial areas in the province.

B. PRESENTATION

Presentation 1. Pilot Project in Indonesia and the Working Group formulation Presented by Dr. Masakazu Takahashi - Study Team Leader

Was explained about Area Business Continuity Plan (ABCP). It required the establishment of a working group that will formulate ABCP and also provide a variety of basic information on the project (ABCP & BCP). The background of the importance of this project starts from the high risk of discontinuation of a business due to natural disasters as well as the impact that could spread to global scale, and Indonesia is one of the country that has a high risk to be affected by the disaster. In Japan, one of the economic impact to keep in mind is when the Kobe Earthquake strikes in 1995. In addition of many casualties there are also many destroyed infrastructure such as ports, whereas main business sectors of Kobe is Ports. At the time, there was a decrease in the number of ship on board in Kobe Port, whereas before many industries use those ports. This adverse situation can also occur in Indonesia which has a high risk of disaster.

Basically every industry is related to each other, so when a natural disaster occurs, all will be affected. Even to fellow competitors the risk will be the same if they were in the same area. As for the competitors in the different areas, of course it will open up their opportunities. Although major natural disasters have not occurred in the industry central district, but we should begin to think about it and prepare ourself to the possibilities. One of the things that can be done is to establish a working group and composing ABCP. ABCP itself aims to make a fast recovery and thus still have the same competitiveness with other industries. As for the party that need to be included in the working group itself are all stakeholders in the industry chain, supporting organizations, the institutions who are in charge of the provision of utilities, as well as supporting infrastructure agency distribution. To be clearer, the stakeholders are central governments, local governments, research institution, provision of infrastructure, industry, industrial centre, emergency service agencies, and other life supporting institutions.

The project has been started since February 2013 and will be ended in May 2014 specifically in Indonesia. The study project in Indonesia will be conducted in the eastern part of Jakarta with 2 approaches. The first approach is to provide the basic information of ABCP and then will be discussed by the working group so they are able to formulate the ABCP through discussion. The second approach is to highlight the common problems in the industrial area to the working group so they are able to formulate ABCP in the specific region.

The prime focuse of this study is Karawang, but also will be taken 2 other areas that influence the industrial estate in Karawang which are Bekasi regency and the City of Bekasi. It takes cooperation and also the commitment to carry out this ABCP. Furthermore this study project lasted only for a short time, one and a half years, so the participation of all stakeholders is very much needed.

The suggested Grouping Task members were:

- 1. Advisory Group
- 2. Bekasi Regency Group
- 3. Bekasi City Group
- 4. Infrastructure Group of Karawang Regency
- 5. Regency Utilities Network Group of Karawang Regency
- 6. Private Company Group of Karawang Regency

DISCUSSION

1. Mr. Agus Mulyanto - Geological Agency

For information, Geological Agency has already made a hazard maps for earthquakes and landslides. Secondly, all these times many offices have already made a contingency plans. The recommendation resulted from the contingency plan was to create a disaster mitigation scenario in a region. Does ABCP have the same model with the contingency plan? Is there any different steps offered for disaster risk reduction in an industrial area compared to housing areas?

Responded by (?):

All forms of information will be considered as valuable input, e.g. Hazard Map that was already created by the Geological Agency. The information map of the disasterprone zones in settlements or industry will be very useful for this study. Various systems have been carried out in the central government to be discussed furthermore, e.g. the existence of contingency plans which have been prepared by the relevant stakeholders.

2. Mr. Budiman - BBWS Citarum

In disaster context, upstream and downstream areas of the are inseparable. The project was expected to discuss the possibility of an earthquake at the upstream and how it can affect downstream areas. Is there any possibility of dams failure due to the upstream earthquake?

Responded by (?):

All information obtained from every agency will be used as inputs for the study.

3. Mr. Acep - Bina Marga Karawang

Karawang used to considered as inundation susceptible area. Related to flood incidents, Citarum flowed from Purwakarta and Cianjur. Besides Citarum, there is also other river, e.g. Cibeet. All rivers are connected to one another, so it is necessary to have integrated management plan And, it is important to be noted that all rivers now are more shallow, as the situation will affect flood risk in Karawang.

Responded by (?):

All of the information obtained from every agency will be used as inputs for the study.

4. <u>Mr. Putu - Jakarta Police Department</u>

If there any tsunami in Jakarta, it will be more severe than the Japan. Because apart from the sea, the water will come from Bogor and Karawang. There are some steps that have been made in Jakarta, among others, is making a Cut-through. It is necessary to find a long-term solution to solve the problem.

Responded by (?):

It required more detailed information to analyze the flood incidents in Jakarta, because the study area is located in Bekasi and Karawang. Flooding in Jakarta will considered as significant matter for the project, because it will affect conditions in Karawang and Bekasi. Solutions regarding flooding cannot be provided as the presenter is not a flood expert.

5. Bina Marga of Karawang Regency

What strategies need to be done to overcome drought?

Responded by (?):

Drought is a serious matter, especially for the food industry. Our own study is currently more focused on "territory", but in principle this study can be applied to any disaster.

Presentation 2. Risk Assessment of Area BCP Presented by Mr. Shukyo Segawa - Leader of Natural Disaster Risk Assessment

The purpose of the study was to estimate the situations when natural hazards strike industrial area and imagine if it happens, will the industrial businesses still can run well or not. Various hazards are to be assessed such as earthquakes, tsunamis, volcanic eruptions, floods, hurricanes or cyclones, coastal storms, and landslides. Various damages are to be assessed not only in buildings, but also on life support activities. But in the BCP, the identified danger is the danger that dominant in a region.

The steps of natural disaster risk assessment itself begins with identifying the dominant hazards, simulation, risk assessment of the components of life support, and then perform a disaster scenario involving government and corporate countermeasures. The next thing to do is to analyze the impact to the business to be the important input to the formulation of ABCP. Hazard risk assessment outputs produce 2 things: hazard assessment (which produce hazard maps) and the next is a risk assessment. Disaster scenario for the BCP area should not include physical damages but also delays of service and the impact on business continuity. The length of recovery time was certainly a matter that needs to be estimated and included in the prepared disaster scenarios. Therefore, it becomes important to prepare for a disaster scenario for an industrial estate.

DISCUSSION

1. Mr. Agus Mulyanto - Geological Agency

According to the explanation given, it basically has the same concept with contingency plan, only with different title. For the landslide and earthquake hazards, Geological Agency has developed a Hazard Map.

Responded by (?):

Maps and other information will be included in the database and will be beneficial for the study

Presentation 3. Description and Methods of BCP and ABCP, Presented by Mr. Yoshiki Kinehara

Nissan and Toyota are two major industries located in Japan. When earthquake happened, they were affected by the disaster. But within a short time (1 month), they were able to recover. They were recovered because they implement BCP within the industry. They also perform integration with the institutions who support the industry. Basically the company who is implementing BCP will have the same risk with company that does not implement the BCP. However, companies that implement BCP will have a shorter recovery time and the value of the company will be increased.

There are 3 key words that describe what BCP is, they are the core business recovery, recovery time objectives, and securing resources. The purpose of the BCP is to ensure the survival or recovery of initial core business in time of emergency, and then prevent the bankruptcy of the company and enhance shareholder value.

Related to business resources, there are several things to be noted in terms of human resources, property, money, and information. If there is one aspect missing then it will slow down a business, and as we can imagine what happens when all the resources lost at the same time. A company that does not implement BCP will have the resources congestion, and eventually the bottleneck. There are 3 things that we can do to secure these resources, they are by prevention, rapid recovery, and other alternative forms of thinking.

There are several differences between traditional disaster mitigation plan and BCP as distinguished from the main target, the action, the scope of the study, the target recovery time, as well as other things. ABCP is basically a guarantee in an area so when disaster strikes all industries can cope with its effects. ABCP divide responsibilities to all stakeholders, including industry and other relevant agencies.

For Industrial / Corporate, important information can be shared among stakeholders. Some business resources can be shared among stakeholders, and the bargaining power of the infrastructure administrator and relevant authorities will increase.

For infrastructure administrators and authorities related, rapid industry recovery will contribute to the rapid recovery of the livelihoods of citizens. A strong environment for

business continuity will increase the attractiveness of the industry to help increase employment and other matters.

Definition of Area BCP (ABCP) is a framework and direction to act of stakeholders in the context of business continuity in a particular region as a whole. ABCP geographic scope can be applied to industrial areas, agglomeration region, even the state.

Formulation method for ABCP based on ISO22301. The first thing to do is to formulate and manage the ABCP, followed by analysis by the stakeholders so they can share information and discuss, the other thing is to consider an exercise or a test, to see how well we do.

Three important information that should be shared within all stakeholders are

- 1. Hazard Area (Risk Mapping)
- 2. Business Impact Analysis
- 3. Problems and Course of Action

There will be 3 workshops with different topics. The materials for the first workshops (November, 2013) are:

- 1. Regional Business Continuity fundamental policy (draft made by the JICA Study Team will be sent through email to all stakeholders at the end of September).
- 2. Understanding industrial agglomeration area and its context (there will be a worksheet that will be delivered at the end of September).
- 3. Major infrastructure and other business resources (there will be a worksheet that will be delivered at the end of September).
- 4. Regional Hazard Analysis.
- 5. Business Impact Analysis on Regional Business Continuity.

DISCUSSION

1. Mr. Idris - PT. Telkom

a. Related BCP implementation, possibly industrial company that implement BCP will have to bear expensive cost. What are the BCP recovery criteria? As excerpted from the previous presentation, it seemed Kobe Port performance declined after the earthquake?

Responded by (?):

When the earthquake happened, Kobe Port did not have BCP, and its performance declined as the competitors have stolen their opportunities. Now Japan requires industries to implement BCP and ABCP.

b. PT Telkom have implemented BCP within Crisis Management Team (CMT). However, when there was a flood incident in Jakarta, all communications were cut off, while no network can be operated, and radio frequency or satellite need to be used. Immediate actions from all agencies were eneded, and there was delayed process at the moment because the electricity company (PLN) has not operating yet.

Responded by (?):

It can be observed from the ABCP objectives diagram that telecommunication networks required the support of other agency to recover. Thus, further calculation to cope with disaster is needed. Stakeholders commitment and agreement are needed to ensure the immediate and integrated responds.

2. <u>Mr. Otang - BPBD of Bekasi Regency</u>

From the previous presentation, it can be derived that infrastructure played an important role in disaster recovery. One important aspect is the road infrastructure (from road damage, traffic caused, and others). What is the implementation regarding such problem?

Responded by (?):

In implementing ABCP, there are commitments from related agencies to be expected. Related to infrastructure and transportation, there are 3 agencies that are requested to collaborate, i.e. administrator agencies for ports, airports, and road. Road is the main infrastructure needed, as workers are using road to move from their house to the factory, and road is also needed to distribute goods (export and import). Agreement from stakeholders is needed to overcome the disaster impacts to the road facility. And, negligence from an agency can cause obstacles for the continuity of business processes.

3. Mr. Irwansyah - KIIC

What is the output of BCP? Is it a form of management or others? Who can ensure that each stakeholder will implement it?

Responded by (?):

Commitment and proactive participation are needed from stakeholders to produce good performance of ABCP.

Presentation 4. Future Agenda

There will be a workshop on 13 November 2013. Participants of today's Working Group Meeting are expected to attend at the incoming workshop. After a serial of workshops is held, then a seminar will be held on July 2014. While JICA team is not in Indonesia, it is expected to keep the communications running via email (communication in Indonesian is possible), assisted by Mr. Krishna Pribadi and Ms. Lusiana Rumintang (translator/ interpreter).

C. CLOSING

Closing remarks by Mr. Husen Ahmad Bappeda of West Java Province

In mapping risks, studies should not be conducted only disaster-susceptible areas, but also the surrounding environment, which also include analyses on business, potential disturbance, and possible solutions to do. Referring to tsunami incident in Pangandaran, an obstacle related to regulation occurred, when emergency respond was activated (tendering only in the case of emergency response, while in the recovery phase requires another tender). Related common situations related should be highlighted in overcoming disaster incidents. ABCP is expected to accelerated the recovery process to normal situation.







PHILIPPINES WORKING GROUP MEETING

Tuesday, 13 August 2013, Eastwood Richmond Hotel Libis, Quezon City, Metro Manila, Philippines

AGENDA				
8:30	Registration			
9:00	Welcome Address	MC		
9:05	Opening Remarks	Mr. NAKAMURA (JICA Manila)		
9:15	Introduction of the Project,	DR. MASAKAZU		
	Pilot Study in Philippines and	TAKAHASHI,		
	Composition of Working Group	Project Team Leader		
9:45	Q & A			
10:10	Natural Disaster Risk Assessment	Dr. Masakazu Takahashi		
	for Area BCP			
10:30	Q & A			
10:50	Coffee Break			
11:10	Introduction of BCP and Area BCP	MR. YOSHIYUKI TSUJI		
		Deputy Team Leader		
11:40	Q & A			
12:10	Lunch			
13:10	Method of Area BCP Formulation	Mr. Yoshiyuki Tsuji		
13:40	Discussion			
14:10	Plan of the Future Workshops	Dr. Masakazu Takahashi		
14:25	Closing Remarks	OCD		
	Adjournment			

MC: Mr. Ramon J. Santiago







"NATURAL DISASTER RISK ASSESSMENT AND AREA BUSINESS CONTINUITY PLAN FORMULATION FOR INDUSTRIAL AGGLOMERATED AREAS IN THE ASEAN REGION"

A Joint Project of the ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management (AHA Centre) and Japan International Cooperation Agency (JICA)

PHILIPPINES WORKING GROUP MEETING

August 13, 2013, Eastwood Richmond Hotel, Libis, Quezon City Metro Manila, Philippines

Member of Working Group

Classification/Sector		Organization	Position	Name
Lead Implementing Organization	DRMM Program Implementation	National Disaster Risk Reduction and Management Council/Office of Civil defense	UnderSecretary/ Executive Director and Administrator	Eduardo D. Del Rosario
			Regional Director OCD-NCR	Edgardo J. Ollet MNSA
			Regional Director OCD IV-A	Vicente F. Tomazar
	Secretariat	Office of Civil defense	Chief, NDRRM and Head Secretariat	Lenie D. Alegre
	Metropolitan Development Agency	Metropolitan Manila Development Authority	General Manager	Corazon C. Jimenez
Regional Lead Organization	Provincial	Cavite Provincial Government	Governor	Juanito Victor C. Remulla, Jr.
	Governments	Laguna Provincial Government	Governor	Jeorge "ER" Ejercito Estregan
	Development Authority	Laguna Lake Development Authority (LLDA)	General Manager	J.R. Nereus O. Acosta, Ph.D.
Development	Economic Zone Administration	Philippine Economic Zone Authority (PEZA)	Director General	Dr. Lilia B. De Lima
Agency			Deputy Dir Gen for Opns.	Ms. Mary Harriet O. Obordo
			Deputy Dir Gen for Finance & admin	Mr. Justo Porfirio LL. Yusingco
National Government Agency	Energy and Power	Department of Energy	Director, Energy Policy and Planning Bureau	Jesus T. Tamang
		Department of Energy	Director, Petroleum/Oil Industry Management Bureau	Zenaida Y. Monzada
	Socio-Economic	NEDA	Regional Director IV-A	Agnes M. Espinas
	Transportation and Communication	Department of Transportation and Communication	Secretary / Director	Sec. Joseph Emilio Aguinaldo Abaya - designated rep
		Philippine Ports Authority (PPA-GOCC)	General Manager	Atty. Juan C. Sta. Ana
	Bridges and Highways	Department of Public Works and Highways	Regional Director DPWH-NCR	Reynaldo Tagudando
			Regional Director DPWH IV-A	Huillio B. Belleza
		Mla Toll Expressway Corp	President	Mr. Rafael C. Bueno, Jr.







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Member of Working Group

Utilities	Water Sector	Metropolitan Waterworks and Sewerage System (GOCC)	Administrator	Gerardo Esquivel
		Local Water Utilities Administration (GOCC)	Water Development Chief, Local Water Utilities Administration (LWUA)	Aristeo D. Lao
		Maynilad Water Services, Inc.	Senior Manager and Head, Safety Department, Maynilad Water Services, Inc.	Conrado P. Soriano
		Manila Water Company, Inc.	President and Chief Executive Officer	Gerardo C. Ablaza, Jr.
	Dowor	National Grid Corporation of the Philippines (NGCP) GOCC	Head, Reliability and Technical Department(RTAD)	Engr. Cesar D. Sacdal
	rowei	Manila Electric Company	President and Chief Executive Officer/ Hrad, Safety and Environment Management	Oscar S. Reyes / Mr. Marco R. Carlos
	Tele Communications	SMART	Manager	Antonio Fernandez
	Tele-Communications	GLOBE Telecom, Inc.	Senior Engineer	Jay A. Gonzales
Government Research Institute	Hydro-Met	PAGASA	Division Chief, Hydrometeorological Division	Dr. Susan R. Espinueva
	Seismology and Volcanology	PHIVOLCS	Director	Dr. Renato U. Solidum
	Geo-Science	MGB	Director	Engr. Leo L. Jazareno
Business Enterprise	SMEs	Philippine Chamber of Commerce and Industry	Secretary General	Mr. Crisanto S. Frianeza
	Industrial Park	Cavite Economic Zone	Zone Administrator	Ms. Norma Cajulis
		Laguna Technopark		Mr. Patrick C. Avila
		Southern Part of MMla		Mr. Alex Roque
		Cavite Economic Zone	President	Mr. Makoto Yoshida
	Tenant of Industrial Park	SEZ	President	Mr. Kunihiko Tsuru







"NATURAL DISASTER RISK ASSESSMENT AND AREA BUSINESS CONTINUITY PLAN FORMULATION FOR INDUSTRIAL AGGLOMERATED AREAS IN THE ASEAN REGION"

A Joint Project of the ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management (AHA Centre) and Japan International Cooperation Agency (JICA)

PHILIPPINES WORKING GROUP MEETING

August 13, 2013, Eastwood Richmond Hotel, Libis, Quezon City Metro Manila, Philippines

List of Participants

Organization	Position	Name
ЛСА	Deputy Director Disaster Management Division1	Hideaki Matsumoto
JICA Philippine Office	Project Formulation Advisor (Disaster Management)	Hayato Nakamura
JICA Philippine Office	Project Formulation Advisor (Investment Environment)	Kazushi SUZUKI
JICA Philippine Office	Programme Officer (Disaster Management)	Catherine PALANCA
JICA Philippine Office cum Citizen's Participation Promotion Division	Officer (Training Affairs and Citizen Participation Department)	Miki OTSUKA
ЛСА	JICA expert	Takaaki Kusakabe
JICA - AHA Centre Study Team	Team Leader	Masakazu Takahashi
JICA - AHA Centre Study Team	Deputy Team Leader / Area BCP	Yoshiyuki Tsuji
JICA - AHA Centre Study Team	Expert on Flood	Hajime Tanaka
JICA - AHA Centre Study Team	Expert on Earthquake / Tsunami / Volcano	Yoshihiro Yamada
JICA - AHA Centre Study Team	Expert on Geological Hazard / Coordinator	Hiromi NONAKA
JICA - AHA Centre Study Team	National Coordinator	Ramon J. Santiago
JICA - AHA Centre Study Team	Project Staff	Josephine sy





INDONESIA WORKING GROUP MEETING

Thursday, September 19th, 2013, Nam Nuong Hotel, Hai Phong, Viet Nam

MEETING AGENDA				
08.00-8.30	Registration			
8.30-8.40	Welcome Address Ministry of Agriculture and Rural Development	Dr. Nguyen Huu Phuc		
8.40-9.20	Introduction of the Project, the Pilot Study in Indonesia and Composition of Working Group	Dr. Masakazu Takahashi Study Team Leader	MC: Ms. Hoang Minh Nguyet	
9.20-9.45	Q & A			
9.45-10.10	Natural Disaster Risk Assessment for Area BCP	Mr. Shukyo Segawa Leader of Natural Disaster Risk Assessment		
10.10-10.30	Q & A			
10:30-10.45	Coffee Break			
10:45-11.25	Introduction of BCP and Area BCP and Method of Area BCP Formulation	Mr. Yoshiyuki Tsuji Area BCP		
11.25-11.50	Q & A			
11.50-12.00	Plan of the Future Workshops	Dr. Masakazu Takahashi		
12.00	Adjournment			
12.00-13.00	Lunch			

"NATURAL DISASTER RISK ASSESSMENT AND AREA BUSINESS CONTINUITY PLAN FORMULATION FOR INDUSTRIAL AGGLOMERATED AREAS IN THE ASEAN REGION"

PHILIPPINES WORKING GROUP MEETING Eastwood Richmond Hotel, Libis, Quezon City 13 August 2013

Welcome Address

Ramon J. Santiago

Mr. Ramon Santiago started the event by welcoming those who were present. He explained that this meeting is the first of a series of activities that will be held in the Philippines in connection with the implementation of the project. It is also the first time that stakeholders, both from the government and private sectors, were brought together. He expects that during the discussion, some questions, such as concerns about what would be expected of them, may be answered. The JICA-AHA Centre Study Team will provide more insights on how the project has progressed.

Opening Remarks

Hayato Nakamura

Mr. Hayato Nakamura of the JICA Office in Manila then gave the opening remarks, after being introduced by Mr. Santiago. He was grateful for the turn-out despite of the presence of typhoon Labuyo in the country.

Mr. Nakamura explained that the project has two important implications in the Philippines: (1) the connection between various risk/vulnerability assessment and people's movements, and (2) the connection of the Philippines and the ASEAN. In the first, he elaborated that the Philippines has a high level of risk enveloping the economic environment. In order to move forward, there is a need to mitigate and strengthen the investment climate. Thus, it is crucial to connect the risk assessment and the movement of the people. In the second, he explained that disasters do not only affect the ASEAN-member country, but also the entire region. With this, JICA, together with the AHA Center, aims to accumulate knowledge on disaster reduction and management. JICA has worked on disaster risk management and improvement of the investment climate for many years. The pilot areas – Metro Manila, Cavite and Laguna - have become crucial hubs in the ASEAN region. Mr. Nakamura said that everyone's full commitment and support are needed for the success of the project. He also hopes that the discussions will become fruitful.

Introduction of the Project, Pilot Study in the Philippines and Composition of the Working Group Masakazu Takahashi (JICA-AHA Centre ABCP Project Team Leader)

Dr. Masakazu Takahashi, the team leader of the project, was then called to introduce the project and identify the composition of the working group. The copy of his presentation can be found on ANNEX A.

In relation to Dr. Takahashi's presentation, the following points were raised in the open forum:

1. It was noted by NEDA Region IV Director Agnes Espinas that three out of the five pilot areas identified are in the CALABARZON region. However, no one from the audience is from the local government. There is a need to involve these stakeholders, especially those in the provincial Planning and Development Office. They have already completed their disaster risk reduction management integration in their provincial planning and development plan. The provinces of Laguna and Cavite have good initiative on hazard & risk assessment. Thus, there is a need to bring them in, enhance what has already been accomplished, and coordinate more, particularly with the PPDO.

Dr. Takahashi said that this project is a new approach for Area Business Continuity Plan (Area BCP). No country has done this type of study, even in Japan. Tailored risk assessment is needed in this project.

In reply to the earlier recommendation/comment, Mr. Santiago mentioned that they have already obtained the commitment of the two provinces of Laguna and Cavite, through the respective governors, to support the activity. Presentations were already made to inform them about the project. He added that they committed on sending representatives but weren't able to attend. Gov. Remulla, himself, said he is willing to participate and actively support the endeavour in their area. For the Southern part of Metro Manila, the General Manager of MMDA is present, for the pilot component there. Mr. Santiago also welcomes the expression of interest & support of NEDA, particularly in the region, to help the project.

2. Some clarification was made as to the objectives of the project, particularly if it aims on making sure that there is a continuous supply chain even after a disaster. Also, it was asked if the project not only suggests activities that keep businesses afloat in integrated areas in the Philippines, but how it connects to other businesses in other ASEAN countries so that whatever framework & processes that come up as a result of this project, will also necessarily connect with businesses processes there.

Dr. Takahashi replied that the supply chain is important, however, in this project, the team decided to focus first in studying the macro-scale relationship between ASEAN-member countries and those in other parts of the world.

3. One participant perceives both competitiveness and partnership in this project. Different sectors are to work together towards a common goal – National Disaster Risk Management is the domain of the government while Business Continuity Plan is the domain of the private sector. Thus, the resulting working group is expected to do two things jointly. In addition, he mentioned that the supply chain issue comes to fore because of the ASEAN 2015. He stressed the importance of ensuring enough supply of vital resources. Moreover, bigger companies can't do it themselves alone in terms of BCP. There is a need to find a way to work on their own BCP. Lastly, he strongly suggests that the NDRRMC be renamed for easier recall.

Philippine Chamber of Commerce and Industry Secretary-General Crisanto Frianeza explained that the domain-of-government-domain-of-business used to be the paradigm. But in the new law - RA10121, the Disaster Risk Reduction and Management Act of 2010 – the paradigm has been changed. The business groups, private organizations, and NGOs are now part of the new system and may no longer require additional policies. This project is actually embracing the new paradigm.

*While waiting for the next presentation, Mr. Santiago acknowledged the presence of private sectors, NEDA, Philvocs, DPWH, PAG-ASA, Maynilad, Manila Water, JICA Tokyo represented by Mr. Matsumoto who is observing the proceedings.

Natural Disaster Risk Assessment for Area BCP

Masakazu Takahashi

There being no more questions, Mr. Santiago opened the floor to Mr. Takahashi's second presentation regarding Natural Disaster Risk Assessment for Area BCP. Presentation materials can found on Annex B.

The following points were raised in the Q&A portion:

1. There was a question raised by USec. Corazon Jimenez, MMDA General Manager for PHIVOLCS asking if the hazard assessment & risk assessment, which was based on their studies of all LGUs (16 cities & 1 municipality), are complete.

The PHIVOLCS representative Ms. Lynn Melosantos replied that the right entity to ask is the Office of Civil Defense (OCD). In terms of hazard information for areas covered by this project – Metro Manila, Cavite, and Laguna, the hazard information is already available. As an example, she mentioned the West Valley fault that crosses six Metro Manila cities, as well as Cavite and Laguna, has been completely re-mapped on a scale 1:5,000. The information, in fact, is being prepared as a booklet to be disseminated to affect LGUs. She added that PHIVOLCS is distributing the West Valley fault map because the only mitigation measure available for an active fault is avoidance. No engineering measure is available against an active fault or ground rupturing yet. For other hazards, under the recently concluded Ready Project for 2007 & 2008, maps have already been prepared for Laguna & Cavite. Putting all these together is the OCD's responsibility.

2. GM Jimenez commented that the Image of Hazard Map slide is very accurate. She added that this is what everyone wants to see in a hazard map for each area that they would include in the agglomerated BCP.

Again, Ms. Melosantos replied that the information is already available. Hazard maps generated under the Ready Project, are maps from PAGASA, MGB(?), and PHIVOLCS, which covers earthquake, flood, landslide hazards. She added that the information is already in GIS format, handled by NAMRIA.

GM Jimenez further stressed that they should make sure that all planning officers for each LGU have these information to be able to come up with an integrated picture of the hazard maps

Ms. Melosantos replied that under the Ready Project, specifically in Cavite and Laguna, hazard information have been already turned over to the LGUs in 2008.

GM Jimenez expressed confidence that they have something to show for during the workshop.

3. Mr. Santiago, in response to a query by one participant, identified southern part of Metro Manila, particularly Muntinlupa, because this is where business enterprises are located that are not necessarily agglomerated similar to Calabarzon.

GM Jimenez commented that these 3 LGUs in which she hasn't seen an accurate study on.

Ms. Melosantos explained that they are part of an ongoing project.

GM Jimenez expressed that she wasn't impressed with the manner of presentation of these data in some for that she attended and was doubtful of the accuracy of the data. She suggested that there is a need to go back to these areas.

Mr. Santiago said that the team would be making use available of available information, whether it is from MGB, PHIVOLCS, or PAGASA.

4. Mr. Santiago added that the scale oftentimes being used is 1:5,000, which is good enough to look at where your house is.

One participant commented that there is a need to agree on what scale to be used.

Ms. Melosantos of PHIVOLCS said that scale is dependent on what is produced by NAMRIA - 1:5,000 for Metro Manila; 1:10,000 for most cities; and 1:50,000 outside the cities (provinces/municipalities).

Dr. Takahashi added that Japan has a system of producing hazard maps nationally and locally.

5. One participant commented/clarified that the team would be preparing their own hazard maps for the pilot sites, in addition to the existing ones. Apart from the hazard maps, they currently have a risk map, integrated with the hazard map, only piloted in Metro Manila, particularly in Taguig.

Dr. Takahashi added that Metro Manila has many hazard and risk maps and the team will utilize existing ones whenever available. If hazard and risk maps are not available for target areas, the team may use a simulation technique to come up with information. He also said that the Philippines is more advanced in terms of maps compared to Myanmar, Laos, and Cambodia.

PHIVOLCS commented that this project comes at the right time because the hazard mapping & risk assessment projects have been done and is just wrapping up. If the team has arrived a year before, hazard maps are yet to be finished.

6. One participant asked to be clarified if the project would include a system wherein the damage, not just physical but also impact on economy would be included or a system for determining this.

Dr. Takahashi replied that the team will not be estimating the amount of impact on the economy in terms of value, but will just provide a measure of impact on each sector.

Mr. Santiago said that if there is data available and if there is an opportunity to do some calculations based on existing models on regional economy or on a micro scale, potential impact to the national economy may be estimated.

NEDA commented that most of the data will be coming from the locators in economic zones, however, they have some difficulty in accessing the data.

Mr. Santiago added that in a previous meeting with private sectors, concerns were raised on what would be the level of accuracy of the information/details. He said that we do not really need too much detail on the figures, just the general idea on what happened, enough to formulate the Area BCP.

- 7. The group agreed to drop the term "trial & error" as a method to be used in the pilot study.
- 8. PEZA Deputy Director General for Planning Panga commented that there are three economic zones identified as part of pilot areas, but slide in the Cavite economic zone that happens to be the biggest in terms of locator companies, indicated only 90 companies (Japanese companies) while there is close to 300 companies there.

Dr. Takahashi replied that the study focuses on the different types of industrial parks.

PEZA suggested having the study modified/revised as disasters don't discriminate, and that everyone should benefit from this project, not just the Japanese companies. He also added that the focus is more on the business side, and do not intend to cover other stakeholders such as communities surrounding the economic zone.

Introduction of BCP and Area BCP

Yoshiyuki Tsuji (Deputy Team Leader)

Mr. Yoshiyuki Tsuji introduced the Business Continuity Plan and Area BCP. The copy of his presentation can be found on ANNEX C.

In relation to Mr. Tsuji's presentation, the following points were raised in the open forum:

On slide 6 of Mr. Tsuji's presentation – comparing traditional disaster management plan & BCP in the BCP column, PHIVOLCS commented that there are areas where policy advocacy should be
included in "Setting RTO is Mandatory." It is possible for a business center to accept a
mandatory RTO setting, but if it is an international chain, there are probably some policy
regulations that are accepted as business practice. Companies might not easily accept this kind
of mandatory imposition. She suggests that policy advocacy should be included.

Upon further clarification, Ms. Melosantos said that it can be something from the congress, the senate, or any form that can be translated into a formal business process that will be accepted nationally. Furthermore, she said that this can be an advocacy of the OCD or NDRRMC if they want to but we will have to convince them as a group that this is a necessary direction to take. This will be the offshoot of the project, if the group wants it to be.

DOE Representative Mr. Antonio commented about the setting of RTO as mandatory. He said that the recovery time is dependent to the kind of BCP plan. If you are going to develop a BCP, you are obliged to test a recovery plan because the plan itself requires it. It is not mandatory in a sense that it needs an EO, but mandatory in a sense that it is a basic part of the BCP.

Mr. Santiago explained that most of the contingency plans locally are lacking in certain specific time. So when you say BCP, especially the private sector, there is a specific time frame, they are bounded by that objective to be able to continue or sustain operations during specific times. They also set what is realistic for them to sustain business and viability.

Ms. Melosantos explained that the context she is talking about is a generic BCP. She added that if you want to develop an Area BCP, then all members in that area should subscribe to that setting. Some kind of policy advocacy is necessary.

Mr. Santiago mentioned that other countries, especially developed ones, require companies they're dealing with has a BCP to become more competitive and attractive to business partners/clients outside their country. If it becomes practice of the whole, then we'll be ahead of the rest of the competitors.

2. PEZA Deputy Director General for Finance and Administration Justo Porfirio Yusingco wanted to be clarified on the context of application of Area BCP in the Philippines.

The Yamazaki-Torres Representative to the meeting mentioned the Thailand experience when they had the flood. It was expected that some Thailand companies will transfer to the Philippines, but it did not happen. He added that they must have a good recovery plan after the flood. This shows that BCP connected to competitiveness, and we in the Philippines, would like to achieve that level.

Mr. Santiago added that all mitigation measures were undertaken by the private companies among themselves. Because investment is already quite huge in Thailand, rather than relocating, they decided to remain in the area. They introduced to the government additional areas for investment to protect the affected zone/area further. It would be good to ask them their practices during the workshop.

3. Ms. Melosantos asked how the industries affected by the 2011 tsunamis behaved after that.

Mr. Tsuji said that they have few turning points but they have not observed a significant percentage of improvement.

PHIVOLCS mentioned that last January, in a conference held in one of the Universities in the Philippines, a study from Japan investigated about the tsunami and one researcher reported on the supply chain. She suggested that perhaps the study can be traced.

4. Director Espinas asked Mr. Tsuji as to who implements the area BCP in the case of Japan.

To assist Mr. Tsuji in answering the question, Mr. Antonio of DOE referred to slide 12. BCPs can be implemented by individual enterprises, industrial area managers, local authorities, and administrator of infrastructures; even private entities, in coordination with local authorities.

Director Espinas commented that in an area BCP, as what she understood from the presentation, several companies/industries would be involved in it, and several stakeholders/key players would be implementing it. If area BCP would be implemented in the Philippines, the question is who will be taking the lead, and not bound by political boundaries.

Mr. Tsuji answered that the leader should be the local government and other stakeholders are its members.

GM Jimenez added that for Metro Manila, MMDA would take the lead because they are the coordinating body and the authority of 16 cities and 1 municipality. In Cavite and Laguna, respective governors should take the lead.

- 5. Another participant said that the Megaworld area should have an Area BCP because it is placed on the west valley fault and all hazards are there. There should be something to protect the area.
- 6. Another attendee commented that before and during the disaster, NDRRMC takes the lead but during the recovery period, companies should take the lead because they have resources.

Method of Area BCP Formulation

Yoshiyuki Tsuji

Mr. Yoshiyuki Tsuji continues his presentation with the discussion of the Method of Area BCP. The copy of his presentation materials can be found on ANNEX C.

In relation to Mr. Tsuji's presentation, the following items were discussed in the Q&A portion:

1. One attendee clarified if there will be 3 separate parallel workshop or just one integrated workshop for all 3 areas.

Mr. Tsuji answered that there will be one integrated workshop for all 3 areas identified-Laguna, Cavite, and Southern Metro Manila.

2. On page 18 of the presentation hand-out, there is a draft policy based on ISO22301 and participants are to concur as to the policy draft to be emailed by September. Ms. Melosantos asked what if they don't concur.

Mr. Santiago replied that there should be a consensus-building among stakeholders in the formulation of policies, majority will be sufficient.

- 3. Ms. Melosantos said that the answer to her previous question on policy is already in the presentation. She apologized as she was thinking ahead.
- 4. Mr. Santiago explained that there are some members of the JICA-AHA Centre team who will link with the stakeholders because of very specific concerns regarding the conduct of the surveys. Mr. Yamada, in particular, will be seeing PHIVOLCS, but will move around the country; Tanaka-

san will be meeting with PAGASA, other members will be meeting with private companies to answer questions. He requested that everyone must exercise flexibility as it is difficult to have the whole team in one place. Takagi-san will be talking to utilities like Maynilad and MERALCO. Unfortunately, Meralco could not come because of prior engagement.

5. DOE asked if there is any discussion done in the role of insurance (force majeure during disasters).

Mr. Tsuji replied that one of the team members, Mr. Yamada, comes from an insurance company who highlighted that the first priority is knowing the risk. The purpose of BCP is making recovery time to a minimum; in a sense insurance is part of BCP; it is important for private companies discuss how to use insurance in Area BCP.

Mr. Santiago added that it may also work both ways if you have a good BCP. Premium may also be lower because of measures undertaken to lessen risk.

Plan of the Future Workshops

Masakazu Takahashi

Dr. Takahashi presented the plans for future workshops. Materials related to this presentation can found on Annex D.

The following points were discussed during the open forum:

1. One attendee made a clarification on the workshop on November 8. After identifying the industrial agglomerated area, she asked if it is still possible that the composition of the working group be changed.

Mr. Santiago replied that the team has already come up with a tentative list for the working group participants. However, some may have alternates or designate local persons. It will not be limited but may expand a little more.

2. Another participant referred to the content of the first workshop: "It shall include the commitment of the stakeholders." He wants to clarify if the stakeholders mean LGUs like the governors of Cavite, Laguna & Batangas.

Mr. Santiago explained that the team has met with Gov. Remulla, and Chief of Staff of Gov. Ejercito and gave assurances of their commitment to this project to participate. But during the workshop, it is difficult to tie them because it will depend on their availability. If they have delegated to a local person, then that's good enough. The principal will just be updated.

3. GM Jimenez commented that when the BRACE program was presented for Taguig, some Mayors were asking why they are not included in the program. Some mayors might be asking why. She suggested that it may be good to broach the idea to the council.

Mr. Santiago said that it's possible but will have to find an opportune time.

Dr. Takahashi added that the presentation described 2 groups: (1) forming Area BCP – pilot industrial area, and (2) national level – business, focus on promoting ABCP.

4. Another participant would like to know if the assessment of businesses is already done in the areas mentioned.

Dr. Takahashi said for those areas, the team will conduct a survey. A list of industrial parks has already been made.

Mr. Santiago added that the team has presented this to the provincial government of Laguna, to Mr. Guidote. He is the PPRRM. There were concerns raised but were assured that there is support from the LGUs of Laguna and Cavite.

Before the giving floor to Gen. Fajardo for the closing remarks, Mr. Santiago gave a recap of the earlier presentations/ discussions. He mentioned that this is the first time that all the stakeholders/potential stakeholders were gathered in one event. During the morning sessions, participants were introduced to the project. There were intensive discussions, during the afternoon sessions, particularly on the direction by which the project will pursue in the coming months. The Philippines has been selected as one of the pilot areas. Out of this exercise, a good output is expected that will benefit not only the areas that are covered in this study but all ASEAN countries as well. Some questions that were raised include the billing of stakeholders, not only on the level of locators, private enterprises, but also LGUs as well as national agencies.

Closing Remarks

Romeo F. Fajardo Deputy Administrator, Office of Civil Defence

General Fajardo was grateful to be invited to an important undertaking. He is glad that the Philippines is a reticent of the study by JICA & AHA Centre. Through Republic Act 10121, which strengthens the disaster management in the country, the Philippines is aspiring to secure/safeguard the population from the threat of disaster. This study goes one notch higher as it also aims to continue businesses affected by disasters, ensuring the way of life continues.

He takes pride that the national community has taken notice of the country in terms of the field of disaster management. He cites the RA 10121 is a game changer because the Philippines is the only country in the world that has a law on disaster risk reduction & management. Located in the Pacific Ring of Fire, the country is deemed a laboratory for the development of doctrines regarding disaster reduction and risk management and this is probably why JICA is conducting the study here. He recognizes the direction should be in the area BCP. He said that the country has a lot of data to work with and is sure that study will be very successful.

To conclude the event, Mr. Santiago thanked Gen. Fajardo and all who took part in the meeting. He assured everyone that copies of the event proceedings will be furnished to them.




November 2, 2013

List of Working Group Member: Viet Nam

No.	Name	Position	Organization	Classification
1.	Mr. Do Trung Thoai	Vice Chair	Hai Phong City People's Committee	Leading Organization
2.	Mr. Nguyen Ba Tien	Director	Dyke and Flood & Storm Control Department, Agricultural and Rural Development Department	Secretariat
3.	Mr. Nguyen Duc Tho	Head of Administration Office	Dyke and Flood & Storm Control Department, Agricultural and Rural Development Department	Secretariat
4.	Mr. Nguyễn Thành Phương	Chief of Department	DMC - Ministry of Agriculture and Rural Department	National Government
5.	Mr. Tran Vinh Hoan	Vice Director	Hai Phong Economic Zone Management Board	LG Unit, HPC: Planning
6.	Mr. Nguyen Thanh Long	Dpty. Director	Planning and Investment Dept.	LG Unit, HPC: Planning
7.	Mr. Vu Ba Dung	Vice Head	Planning and Investment Dept.	LG Unit, HPC: Planning
8.	Ms. Le Thi Mai	Vice Head	Planning and Investment Dept.	LG Unit, HPC: Planning
9.	Mr. Le Minh Son	Dpty. Director	Industry and Trade Dept.	LG Unit, HPC: Industry
10.	Mr. Bui Van Ly	Vice Hrad of Division	Industry and Trade Dept.	LG Unit, HPC: Industry
11.	Mr. Vu Duy Tung	Dpty. Director	Transportation Dept.	LG Unit, HPC: Road, Railway, Port, Airport Infrastructure Operator: Road, Railway
12.	Mr. Pham Van Tuan	Dpty. Director	Information and Communication Dept.	LG Unit, HPC: Information and Communication Lifeline Utility Operator: Telephone & Communication
13.	Ms. Nguyen Thu Ha	BCVT/Head of BCVT Division	Information and Communication Dept.	LG Unit, HPC: Information and Communication Lifeline Utility Operator: Telephone & Communication
14.	Mr. Bui Thanh Long	Dpty. Director	Hai Phong Radio and Television	LG Unit, HPC: Information and Communication Lifeline Utility Operator: Telephone & Communication
15.	Ms. Phan Mai Huong	Reporter	Hai Phong Radio and Television	LG Unit, HPC: Information and Communication Lifeline Utility Operator: Telephone & Communication
16.	Mr. Pham Quoc Ka	Dpty. Director	Natural Resources and Environment Dept.	LG Unit, HPC: Environment





List of Working Group Member: Viet Nam (Continued)

No.	Name	Position	Organization	Classification
17.	Mr. Pham Viet Dung	Dpty. Director	Fire Station	LG Unit, HPC: Emergency Responder
18.	Mr. Tran Dinh Vang	Dpty .Director	Police Department	LG Unit, HPC: Emergency Responder
19.	Mr. Do Thanh Trung	Vice Head of Division	Police Department	LG Unit, HPC: Emergency Responder
20.	Mr. Nguyen Vu Thang	Dpty. Director	Hydrometeorology Center in Northern East Zone	Research Institution: Forecasting & Early Warning
21.	Mr. Bui Van Minh	Director	Hai Phong Port Authority	Infrastructure Operator: Port
22.	Mr. Nghiem Quoc Vinh	Vice Director	Hai Phong Port Holding Limited Liability Company	Infrastructure Operator: Port
23.	Mr. Nguyen Quoc Tuan	Dpty .Director	Cat Bi Airport	Infrastructure Operator: Airport
24.	Mr. Nguyen Thanh Hung	Dpty .Director	Hai Phong Electric One Member Limited Company	Lifeline Utility Operator: Electricity
25.	Mr. Le Anh Tuan	Officer	Hai Phong Electric One Member Limited Company	Lifeline Utility Operator: Electricity
26.	ТВА	ТВА	Electricity Viet Nam Northern Power Corporation	Lifeline Utility Operator: Electricity
27.	Mr. Vu Huu Thanh	Dpty. Director Construction Dept. of HP	Hai Phong Water Supply One Member, Hai Phong Sewerage & Drainage Supply One Member	Lifeline Utility Operator: Water, Sewerage & Drainage
28.	Mr. Takashi Masuno	President	Nomura Haiphong Industrial Zone	Private Sector: Industrial Park
29.	Mr. Pham Doan Tung	Vice Director	Dinh Vu Industrial Zone	Private Sector: Industrial Park
30.	ТВА	TBA	Do Son Industrial Zone	Private Sector: Industrial Park
31.	ТВА	TBA	Trang Due Industrial Zone	Private Sector: Industrial Park
32.	ТВА	ТВА	Tan Lien Industrial Zone	Private Sector: Industrial Park
33.	ТВА	ТВА	Nam Cau Kien Industrial Zone	Private Sector: Industrial Park
34.	Mr. Nguyen Xuan Truong	Director	Management Board of the Project for Infrastructure Construction of Industiral Zone of Hai Phong	Private Sector: Industrial Park
35.	Mr. Takashi Kawai	Director General	Tenant of Industrial Park: Yazaki HP VN Co., Ltd.,	Private Sector: Tenant of Industrial Park
36.	Mr. Kunio Mitobe	Director General	Tenant of Industrial Park: Tohoku Pioneer Co., Ltd.	Private Sector: Tenant of Industrial Park
37.	Mr. Katsunori Katayama	Director General	Tenant of Industrial Park: Toyota Gosei Haiphong Co., Ltd.	Private Sector: Tenant of Industrial Park
38.	Mr. Mitsutaka Matsubara	ТВА	Logistic Company: Yusen Logistics International (Vietnam) Co., Ltd.	Private Sector: Logistic





List of Working Group Member: Viet Nam (Continued)

No.	Name	Position	Organization	Classification			
39.	ТВА	ТВА	Logistic Company	Private Sector: Logistic			
40.	Mr. Phi Van Duc	Chairman	VCCI Hai Phong Branch	Private Sector: Chamber of Commerce and Industry			
41.	Mr. Vu Xuan Binh	Head	VCCI Hai Phong Branch	Private Sector: Chamber of Commerce and Industry			
42.	ТВА	ТВА	Trang Due Industrial Zone	Private Sector: Industrial Park			
Obse	Observer						
43.	Dr. Dinh Van Hung	Director	Geo-environment and Territorial Institution Center	Research Institution			
44.	Mr. Dau Anh Tuan (Panelist)	General Director	Legal Department, VCCI	Private Sector: Chamber of Commerce and Industry			
45.	Dr. Dang Thanh Mai (Panelist)	Deputy Director	National Centre for Hydro-Meteorological Forecasting	Research Institution: Forecasting & Early Warning			
46.	Dr. Tran Ngoc Anh	Associate Professor	University of Science, Vietnam National University	Research Institution			
47.	Mr. Eiichi Yumoto	JICA Expert	JICA	Donner			
48.	Mr. William Taylor	Acting Country Representative	Asia Foundation	Donner			

"NATURAL DISASTER RISK ASSESSMENT AND AREA BUSINESS CONTINUITY PLAN (BCP) FORMULATION FOR INDUSTRIAL AGGLOMERATED AREAS IN THE ASEAN REGION"

Nam Cuong hotel, Ngo Quyen district, Hai Phong, Vietnam 19 September 2013

Welcome Address

Hoang Minh Nguyet

Ms. Hoang Minh Nguyet started the event by welcoming those who were present. She introduced that in collaboration with AHA Center, JICA launched the study on "*Natural disasters risk assessment and area business continuity plan (ABCP) formulation for industrial agglomerated areas in the ASEAN region*" in Febuary 2013. Among activities, meetings and workshops of the project, today is the first working group meeting in Hai Phong and the AHA center-JICA Study Team shall present the study at the meeting.

Ms. Nguyet introduced the VIP participants which can be found on Annex A, and then invited Mr.Nguyen Huu Phuc for the opening remarks.

Opening Remarks

Dr. Nguyen Huu Phuc (MARD)

Dr. Phuc then gave the opening remarks, after being introduced by Ms. Nguyet. He explained that in the progress of industrialization in Vietnam, mitigating the effects of natural disasters are an important tasks. The Vietnamese government also had its own policy on natural disaster mitigation. Since it was outstanding issue, Vietnam needs to learn the experiences and lessons from the past as well as to be opened to new ideas and studies from their partners, especially from Japan and other countries in the region. In addition, he informed that the Law on Natural Disasters Prevention and Response issued in May 2013 and entered into force in May 2014 is showing the great attention of the government to the natural disaster prevention. Dr. Phuc on behalf of the MARD express appreciation to AHA Center and JICA for the project, the pilot stydy in Hai Phong which would help them to pproach and formulate a sustainable development plan. ABCP is a new issue in Vietnam, hence, they would research, implement and spread the model as much as possible.

Then, Dr. Phuc introduced process and content of the meeting that the Study Team shall present on methods of approach and formulation of ABCP, natural disaster risk assessment, what is BCP and ABCP, formulating a working group with participations of different stakeholders. Mr. Phuc ended his remarks by hoping that the meeting will be successful.

After the opening remarks, all attendees were called for taking group photo.

Introduction of the Project, Pilot Study in Hai Phong city and Composition of the Working Group

Dr. Masakazu Takahashi (JICA-AHA Centre ABCP Project Team Leader)

Dr. Masakazu Takahashi, Study Team Leader, was then called to introduce the project and identify the composition of the working group. The copy of his presentation can be found on ANNEX B.

In relation to Dr. Takahashi's presentation, the following points were raised:

1. Mr. Nguyen Vu Thang (Deputy Director of Hydrometeorology Center in Northern East Zone) raised the first question: In fact, the natural disasters had been happened in the past, so what is importance of natural disaster risk assessment. And what is the relation between natural disaster risk assessment and response activities to it in this project? Mr. Thang also shared the difficulties of local agencies in responding to natural disaster due to their shortage of capable human resources and financial source.

Dr. Takahashi replied that as mentioned in his presentation, natural disaster risk assessment is very important issue and is the prior condition of Area Business Continuity Plan Formulation. He also explained that "Natural Disaster Risk Assessment" is to estimate the situation if natural hazards may occurs and impact to the industrial areas; and also to image the response of businesses when natural disaster strike and werther businesse can be continued or not.

There were no more questions, Dr. Takahashi then requested people to contact their project coordinators via email if they have any queries.

Natural Disaster Risk Assessment for Area BCP Mr. Shukyo Segawa (Leader of Nature Disaster Assessment)

Mr. Shukyo Segawa, Leader of Nature Disaster Assessment, started the second session with his presentation on natural disaster risk assessment for area BCP. The copy of his presentation can be found on ANNEX C.

In relation to Mr. Segawa's presentation, the following points were raised:

1. Dr. Phuc explained that in the progress of industrialization in Vietnam, mitigating effects of natural disaster is an important task. Mr. Nguyen Huu Phuc was referring to two key issues of zoning and classifiying level of natural disaster. At the moment, Ministry of Agriculture and Rural development and Ministry of Natural Resources and Environment are start zoning the natural disaster before May 2014 under the great attention and decision of the Governent Vietnamese

Prime Minister and classifying damage at national level, then related agencies would get involved into discussions.

Dr. Phuc also took examples from past natural disasters happened in Vietnam, Cat Hai dike system is designed to response to storm slevel 10 and the Tropical Storm Son Tinh was at level 12 and the Dyke System are coped well to the storm. This is essential to identify, classify and assess natural disasters for seting response measures. Thus, the working group could combine the information with their study to have the project run properly. He also said that the approach of JICA is somhow similar to what Vietnamese agencies are doing, but there are a big difference that in Vietnam, agencies only focus on Natural disaster but do not assess the impacts of Natural disaster to economics and human and their damages.

Dr. Phuc also said that since it was outstanding issue, they need to refers to lessons learned from the past as well as tobe open to new ideas and studies from their partners, expecially from Japan and other countries in the region. Dr. Phuc on behalf of Ministry of Agriculture and Rural development express appreciation to AHA Center and JICA for the stydy, which would help them approach and formulate a sustainable development plan. A-BCP is very new issue to Vietnam, hence, they would research, implement and spread the model as much as possible.

2. Mr. Nguyen Ba Tien From Hai Phong Department of Argriculture and Rural Development commented that when natural disaster orccurs they only assess the direct damages on human and properties but no assessment on the impacts of natural disaster on business, economics and industry.

Mr. Tien rated the importance of ABCP to sustain business continuity for enterprises. In addition, he said that in order to formulate a proper mitigating plan, each member of the working group including representatives from many departments in Hai Phong city should have their own assessments based on vision from their specialist knowledge and experiences in their working field. By that way, they would have a complete picture of natural disaster effects on business and bring these information to the next working group meetings.

Mr. Tien said according to guidance of the city's authority, the leader of related departments had to invite representatives of lower agencies to join the working group such as department of business management, enterprises, industrial parks and zones, airport, seaport, etc. He hoped that the list of members in working group would be confirmed and finalised in the meeting. He also confirmed that his department would join the group to help the project to reach its target.

Mr. Segawa said thanks to Mr. Tien for his comment. He added that the Study will prepare kinds of maps which had been mentioned to in his presentation, for

example disaster map. However, they just only assess impacts of natural disaster on infrastructure and industrial parks in general, not to assess the specific damage of each park. Therefore, he urged members of working group to provide their own information in the future meetings and worksops to help the project team formulate the plan successfully.

- 3. Mr. Ton Duc Hai urged the meeting attendees: leaders, managers, members... to contribute comments and incorporate the working group JICA in Hai Phong to be studied, widely deployed.
- 4. Ms. Nguyet announced the list ofworking group members which can be found in Annex D.
- 5. Mr. Tran Vinh Hoan, Director of Hai Phong Economic Zone Management Board suggested the team to add more member to working group. From Dinh Vu Industrial park he recommended Bridgestone and TVTECH- a Joint Venture between Petro Vietnam and Viet Nam Garment and Textile Corporation, which has investment capital over 300 millions US dollars. From VSIP Industrial Park he recommend 01 member that the Team can select Fujixerox or some other ternants.

Also, Mr. Hoan requested members to identify differences between industrial zone and industrial park. The park was certified by provincial authority and has area less than 75 hectars and the zone was certified by national authority with areas over 75 hectars. In this project, the team needs to clarify project's range (parks or zones).

Dr. Takahashi said thanks to Mr. Hoan for his comments and announced that the Team are happy to add more members including suggested one. He explained that their study was basic research on industrial parks and zones and was not applied for any specific subject. Because of that, every single park or zone needed to base on the study to formulate and adjust their own plan. Dr. Takahashi asked Mr. Hoan and his department to help introduce more representatives to join in the working group.

Mr. Hoan suggested the Hai Phong department of Industry and Trade to help introduce a representative from the Tan Lien Industrial Park.

Introduction of BCP and Area BCP - Method of Area BCP Formulation for Hai Phong

Yoshiyuki Tsuji (Project Deputy Team Leader)

Mr. Yoshiyuki Tsuji, deputy team leader of the project, presented Introduction of BCP and Area BCP - Method of Area BCP Formulation for Hai Phong. The copy of his presentation can be found in Annex E.

In relation to Mr. Tsuji's presentation, the following items were discussed in the Q&A portion:

1. Dr. Nguyen Huu Phuc concluded that the Mr. Tsuji 's presentation is very important for study in Hai Phong. He hoped they could have chance to approach advanced methods by having participation from difference agencies. He would report the situation to MARD and Hai Phong People's Committee to ask them help guide other research agencies and the community to get involve in this project. He also request members to study more the term "core business" and clarify "BCP" and "ABCP" to have a better plan formulation.

Future Plan for the coming workshop and closing remarks

Dr. Masakazu Takahashi (JICA-AHA Centre ABCP Project Team Leader)

Dr. Takahashi presented the plans for future workshops. Materials related to this presentation can found on Annex F.

Dr. Takahashi explained the ABCP is very new term; hence whenever people have any queries they could contact their project coordinators in Vietnam.

Closing Remarks

Ms. Hoang Minh Nguyet thanked the participation of all attendees in the work group meeting and to see each others again in the next meeting in November 4th, 2013.

Note:

- Annex A: Attendance list
- Annex B: Introduction of Project, Pilot Study in Hai Phong and Compositioni of Working Group
- Annex C: Natural Disaster Risk Assessment for Area BCP
- Annex D: Working Group list
- Annex E: Introduction of BCP and Area BCP Method of Area BCP Formulation for Hai Phong
- Annex F: Future Plan for the coming workshops

No.	Date	Time	Place	Attendee	Study Team
1	Aug. 19,	09:00 - 10:30	Himpunan Kawasan Industri Indonesia (Indonesia Industrial Estates Association)	Mr. Edwin Gusdirzal (Associates Secretary)	Mr. Takagi, Mr. Wakabayashi
2	Aug. 19,	09.00 - 11.00	JETRO Indonesia	Mr. Kazuhiro Aizawa	Mr. Shingo
3	Aug. 19,	10 00 - 12.00	BMKG (Agency for Meteorology, Climatology and Geophysics)	Mr. Rakhindro Pandu (Head of sub division engineering seismology data)	Mr. Segawa, Mr. Yamada, Mr. Tanaka
4	Aug. 19,	14.00 - 15.00	KADIN Indonesia (Indonesian Chamber of Commerce and Industry)	Mr. Siddharta Moersjid (Chairman CSR-Kadin)	Mr. Shingo
5	Aug. 19,	14.00 - 16.00	BIG (Geospatial Information Agency)	Dr. Yusuf S. Djajadihardja (Deputy Chairman For Geospatial Information Infrastructure)	Mr. Segawa, Mr. Yamada
6	Aug. 19,	14:30 - 15:30	KIIC, Karawang International Industrial City	Mr. Yano Kunio (President Director), Mr. Masakazu Nomura (Director), Mr. Fumitaka Nakamura (Marketing Manager & Tenant Relation), Mr. Adi Priatno (General Manager Estates Services)	Mr. Takagi, Mr. Wakabayashi, Mr. Tanaka
7	Aug. 20,	09.45 - 12.00	BKPM (Indonesia Investment Coordinating Board)	Ms. Frielianna Yessie Lorenz (Data & Information Center), Mr. Ahmad Faisal Suralaga (Section for Services and Industrial Zone)	Mr. Shingo
8	Aug. 20,	13.00 - 14.45	BPS (Statistics Indonesia)	Mrs. Bana Badri (Subdit Statistic Promotion)	Mr. Shingo
9	Aug. 20,	13.00 - 14:00	Perpamsi (Indonesian Water Supply Association)	Mr. Agus Sunara (Executive Director)	Mr. Hashimoto
10	Aug. 20,	13:00 - 14:00	PU Bina Marga (Ministry of Public Work Road Department)	Mrs. Maulidya (Kasubdit Teknik Lingkungan), Mr. Yudho Dwi H (Staff Subdit Teknik Lingkungan), Huluan Sinurat (Staff Subdit Teknik Lingkungan)	Mr. Takagi
11	Aug. 21,	09:00 - 10:30	Pusat Survei Geologi (PSG, Geological Survey Center)	Mr. Januar H Setiawan	Mr. Segawa, Mr. Yamada
12	Aug. 21,	10:00 - 11:00	BPBD Bekasi Regency	Mr. Sahat MBJ Nahor, Sh, MH (Head of BPBD Kab. Bekasi)	Mr. Tanaka
13	Aug. 21,	10:00 - 11:30	PDAM Tirta Tarum, Karawang Regency	Mr. Asep Suntoro (Head of R&D), Mr. Suharna (Staff of Technical Planning Div.), Mr. Jumali (Corp Secretary), Domin Idi (Head of Adm. Div), Rahmat B (Staff of Distribution Div.), Kiki Kurniawan (Staff of Costumer Relation), Jaswadi Wildana (Staff of Costumer Relation)	Mr. Takagi, Mr. Wakabayashi
14	Aug. 21,	11.00 - 13.00	KADIN Jakarta (Jakartaq Chamber of Commerce and Industry)	Mr. Irwan Hutasoit (Vice Chairman Kadin Jakarta)	Mr. Shingo, Mr. Hashimoto
15	Aug. 21,	14.00 - 16.00	Dinas Sosial & PB, Karawang Regency	Mr. Rokhuyun (Head of Social & PB Agency, Kab. Karawang)	Mr. Tanaka

16	Aug. 22,	08.30 - 09.00	BPBD West Java	Mr. Gatot Soedradjat (Senior Advisor BPBD West Java)	Mr. Shingo
17	Aug. 22,	10:00 - 11:15	PT Pelabuhan Indonesia II (Indonesia Port Company, Tanjung Priok Branch)	Mr. Eko Afrilianto (Manager of Technic), Mr. Agus Sulistyo (Costumer Service Manager & System Information), Mr. Sofyan Gumelar (Costumer Service Port of Tanjung Priok), Ms. Ika Oktania (Ass. Manager of Technical Planning)	Mr. Takagi
18	Aug. 22,	15.00 - 16.00	BAPPEDA West Java	Mr. Husein Achmad (BAPPEDA Secretary)	Mr. Shingo
19	Aug. 23,	08:30 - 10:00	Institute Teknologi Bandung (ITB), Bandung Institute of Technology	Professor. Masyhur Irsyam, MSE., Ph.D. (Research Center for Disaster Mitigation)	Mr. Segawa, Mr. Yamada
20	Aug. 23,	09.00 - 10:30	PLN Karawang	Mr. Eko Mulyo (Manager Area)	Mr. Hashimoto
21	Aug. 23,	09.30 - 11.30	BPMPT Karawang Regency	Mr. Okih Hermawan (Chairman BPMPT)	Mr. Shingo
22	Aug. 23,	10:00 - 11:00	PT Jasa Marga (Toll Road Company)	Mr. Heru (Corp Relation Div.), Suharyanto, PM, Bambang Irawan, Raddy R Lukman, Rachiasih, Hendra Nata Saputra, Tyson Valentio S, David Sagara	Mr. Takagi
23	Aug. 23,	10:30 - 11:30	Pusat Volcanologi dan Mitigasi Bencana Geologi (PVMBG, Center for Volcanology and Geological Disaster Mitigation)	Mr. Hendrasto Gunawan (Head of Eastern Region Volcano Monitoring and Research), Ms. Gede Suanfika, Mr. Agus Solihin, Mr. Agus Budianto (Head of Western Region Volcano Monitoring and Research), Mr. Supriyar Andreasuh	Mr. Segawa, Mr. Yamada
24	Aug. 23,	14.00 - 16.00	Perum Jasa Tirta II (PJT II)	Mr. Harry M. Sungguh (Director of Water Management)	Mr. Tanaka
25	Aug. 23,	14.00 - 17.00	BAPPEDA Karawang Regency	Mr. Didin Rachmady (Chairman Bappeda), Mr Samsuri	Mr. Shingo
26	Aug. 23,	14.00 - 14:30	PDAM Karawang	Mr. Suharna (Staff of Planning Division)	Mr. Hashimoto
27	Aug. 23,	17.30 - 18:15	PT Karawang Taro Logistics	Mr. Steven Setiawan (General Manager)[Mr. Hashimoto
28	Aug. 26,	07:30 - 8:00	RISTEK (Ministry of State for Research and Technology)	Dr. Pariatmono Sukamdo (Head of Information Center for Research on Natural Disaster (PIRBA), Ministry of Research and Technology)	Dr. Takahashi, Mr. Fukuhara
29	Aug. 26,	08.30 - 10.30	The Jakarta Japanese Club	Mr. Susumu Yoshida	Mr. Shingo
30	Aug. 26,	10.00 - 12.00	Bappeda Bekasi Regency	Mr. E.Y. Taufik (Kabid Fisik & Prasarana)	Mr. Tanaka
31	Aug. 26,	10:00 - 11:00	Kementerian Perhubungan (Ministry of Transportation)	Euis EK Sugiyatno, Mutharuddin, Arif Pintoko, Ipang Prasojo, M. Adil Wanedi, Irdriantoro, Mastuti, Sara Zamilah	Mr. Takagi
32	Aug. 26,	15.00 - 16.00	PT Shin-etsu Polymer Indnesia	Mr. Hiroto Nanayama (President Director)	Mr. Wakabayashi

33	Aug. 27,	08:15 - 08:45	BNPB (National Board for Disaster Management)	Mr. Dody Ruswandi (Deputy Chief for Prevention	Dr. Takahashi, Mr.
	8,			and Preparedness)	Fukuhara
34	Aug. 27,	09.00 - 12.00	Ministry of Industry	Mr. Dharma Budhi (Director Industry Resilience), Mrs. Endang Supraptini (Director PPI)	Mr. Shingo
35	Aug. 27,	14:00 - 15:00	Bappenas (Ministry of National Development Planning)	Dr. Max H. Pohan (Deputy of Directorate of Regional Development), Mr. Uke Muhammad Husen (Head of the sub directorate of spatial planning)	Dr. Takahashi, Mr. Fukuhara
36	Aug. 27,	15.00 - 17.00	APINDO (Organization of Indonesia Employers)	Mr. Agung Pambudhi (Executive Director)	Mr. Shingo
37	Aug. 28,	10.00 - 12.00	BAPPENAS (National Development Planning Agency Republic of Indonesia)	Mr. Kuswiyanto (Kasubdit Kawasan Rawan Bencana)	Mr. Shingo
38	Aug. 28,	10:00 - 11:00	Asian Development Bank Indonesia (ADB)	Renadi Budiman (Senior Finance Manager), Deeny U.R. Simanjuntak (Project Officer)	Mr. Takagi

No.	Date	Time	Place	Attendee	Study Team
1	Aug. 12,	13:00 - 15:00	Flood Control Information Center (FCIC), MMDA	Mr. Pablo R. Bautista (Assistant Head, FCIC)	Mr. Tsuji, Mr. Tanaka,
2	Aug. 12,	14:00 - 16:30	Laguna Technopark (LTI) – Administration Office	Rona Sañez (Sales and Marketing Manager)	Mr. Takagi, Mr. Wakabayashi
3	Aug. 12,	14:00 - 15:20	JETRO Manila	Mr. Iwami Katsushi (Investment and EPA advisor)	Mr. Shingo, Mr. Hashimoto
4	Aug. 12,	15:30 - 16:30	JICA Philippine Office	Mr. Hayato Nakamura Mr. Kazushi Suzuki	Dr. Takahashi, Mr. Tsuji, Mr. Tanaka, Ms. Nonaka
5	Aug. 12,	16:00 - 17:20	JCCIPI	Masazumi Nishizawa (Director) Nobuo Fujii (Vice Chairperson)	Mr. Shingo, Mr. Hashimoto
6	Aug. 12,	16:30 - 17:00	Port Management Office (PMO) of Batangas	Atty. Leopoldo C. Biscocho, Jr.	Mr. Yamada
7	Aug. 13,	09:45 - 11:00	Cavite Economic Zone (EZ) – Administration Office	Engr. Ronald Flores (Manager-OIC, Operations Dept), Jhovs Medico (OIC-Environmental, Health & Safety Division), Ramon Lacap Jr. (Engineer III)	Mr. Takagi, Mr. Wakabayashi
8	Aug. 13,	10:00 - 11:15	NIPPON EXPRESS PHILIPPINES CORPORATION	Takao Mizuno (General Manager, Air Cargo Division) Tsunekazu Matsui (Assistant General Manager, Air Cargo Division)	Mr. Shingo, Mr. Hashimoto
9	Aug. 13,	13:30 - 14:30	Cavite Provincial Government – Office of Public Safety	Darianne Natividad (Public Services Officer III) Kimmy Zyra Balmeo (Nurse I)	Mr. Takagi, Mr. Wakabayashi
10	Aug. 13,	16:00 - 17:00	MMDA	JIMENEZ, Corazon T.(Undersecretary / General 11Manager)	Dr. Takahashi, Mr. Tsuji, Ms. Nonaka
11	Aug. 13,	16:00 - 17:20	EPSON PRECISION (PHILIPPINES), INC.	Mr. Kazuyuki Amano (President) Mr. Kenjiro Okuhara (Senior General Manager)	
12	Aug. 14,	09:30 - 10:10	Oil Industry Management Bureau (OIMB), Department of Energy	Rodela Romero (Asst. Director, OIMB), Laura Saquin (Chief Science Research Specialist (SRS)), Ricardo Infante (Supervising SRS), Zenaida Lazaro (Supervising SRS), Mark Christian Marciano (SRS II (EPIRA))	Mr. Takagi
13	Aug. 14,	09:45 - 10:10	Department of Energy (DOE)	Ms. Rodela Romero (Asst. Director, Oil Industry Management Bureau (OIMB)), Ms. Laura Saquin, (Chief Science Research Specialist (SRS), OIMB), Mr. Ricardo Infante (Supervising SRS, OIMB), Ms. Zenaida Lazaro (Supervising SRS, OIMB), Mr. Mark Christian Marciano (SRS II (EPIRA))	Mr. Takagi
14	Aug. 14,	10:00 - 11:00	PEZA	PANGA, Tereso O. (Deputy Director General)	Dr. Takahashi, Ms. Nonaka
15	Aug. 14,	10:00 - 12:00	Office of Civil Defense (OCD)	Mr. Hon Romeo Fajardo (Deputy Administrator)	Dr. Takahashi,

				LTC Edwin C. Sandang GSC (SC) PA (Senior	Mr. Shingo,
				Military Assistant to Civil Defense	Mr. Hashimoto, Mr.
				Administrator)	Tanaka, Ms. Nonaka
				Mr. Marvin T. Manzano (Executive Assistant)	
				Mr. Takaaki KUSAKABE (OCD 16Policy Advisor,	
				JICA)	
16	Aug. 14,	11:00 - 11:30	Department of Science and Technology (DOST),	Mr. Larry Tibay (Director, ICTO-Telof), Mr.	Mr. Takagi
			Telecommunications Office, ICT Office (TelOf-	Dominador Garabiles (Engr. IV), Mr. George	
			ІСТО)	Tardio (Engr. III), Mr. Ruben Tadina (Engr. II)	
				Mr. Antonio Padre (Engr. II)	
17	Aug. 14,	14:45 - 16:30	Laguna Provincial Planning and Development	Valentin Guidote, Jr. (Provincial Planning and	Mr. Hashimoto,
			Office (PPDO)	Development Coordinator)	Mr. Tanaka, Mr. Takagi
18	Aug. 14,	15:00 - 16:30	Provincial Government of Laguna Lake	Mr. Valentin P. Guidote, Jr (Provincial Planning	Mr. Hashimoto,
				and Development Coordinator)	Mr. Tanaka, Mr. Takagı
19	Aug. 14,	16:00 - 17:00	Daiho Industrial Corporation	Mr. Fumio Nisitani (Factory Director)	Mr. Wakabayashi
20	Aug. 15,	10:00 - 11:30	PAGASA	Ms. Susan R, Espinueva Ph.D (Chief of Division)	Mr. Tanaka
21	Aug. 15,	10:00 - 12:00	PHIVOLCS	Dr. Renato Solidum (Director)	Dr. Takahashi,
				Dr. Bart Bautista (Asst. Director)	Mr. Yamada,
				Dr. Rhommel Grutas (Seismologist)	Ms. Nonaka
22	Aug. 15,	10:00 - 10:15	Cavite Economic Zone (CEZ)	Ms Nori B. Cajulis (Zone Administrator)	Mr. Shingo
23	Aug. 15,	13:30 - 14:20	Philippine Economic Zone Authority (PEZA)	Ms Anidelle Joy M. Alguso (Manager	Mr. Shingo
				Management Information Systems (MIS)	
				Department)	
24	Aug. 15,	16:30 - 17:30	JBIC Manila	Mr. Takanori Satake, Mr Hiromi Iwasaki	Mr. Shingo
25	Aug. 16,	9:30 - 11:00	National Statistics Office (MSO)	Ms Estela T. De Guzman (Director	Mr. Shingo
				Industry and Trade Statistics Department)	
26	Aug. 16,	10:00 - 11:00	Planning Services, Department of Public Works	Leonardo Lingan (Hydraulics Division, BOD),	Mr. Hashimoto,
			and Highways (DPWH)	Martiniano dela Cruz (Hydraulics Division,	Mr. Tanaka, Mr. Takagi
				BOD), Elmo F. Atillano (Engr. III, DPD, Planning	
				Service) Aquilina T. Decilos (Engr. III, DPD,	
				Planning Service), Ma. Visna M. Maw (Engr. IV,	
				BOM), Renato Reyes (Engr. IV,	
				Engr. Edwin Fortes, Division Chief,	
				Infrastructure Planning Research and Statistics	
				Division (IPRSD))	
27	Aug. 16,	13:30 - 14:30	National Economic Development Agency (NEDA)	Mr. Dennis Lim (Economic Development	Mr. Shingo
	A 10	10:00 17:00		Specialist)	
28	Aug. 16,	13:30 - 15:00	Provincial Government of Cavite	Mr. Jesus I, Barrera (PPDO)	Mr. Tanaka
				Mr. Kosendo Delos Reyes (OIC. Asst. Provincial	
				Engineer)	

29	Aug. 16,	14:00 - 15:30	Department of Transportation an	Raphael Lavides (Chief Transport Development	Mr. Takagi
			Communications (DOTC)	Officer, Air Transport Planning Division)	
				Enrico Ferre (Chief Transport Development	
				Officer, Water Transport Planning Division)	
30	Aug. 16,	$16:30 \sim 17:30$	Makati Busingga Club (MPC)	Mr. Peter V. Perfecto (Executive Director;	Mr. Takagi, Mr. Shingo
			Makati Business Club (MBC)	Mr.Anthony Patrick Chua, Programs Officer)	
31	Aug. 16,	$16:30 \sim 17:30$	Meralco (Power Distributor)	Mr. Marco R. Carlos (Head Safety &	Mr. Hashimoto
				Environment Management)	

No.	Date	Time	Place	Attendee	Study Team
1	Aug. 1,	11:00 - 11:50	Ministry of Agriculture and Rural Development (MARD)	Dr. Hoang Van Thang (Vice Minister), Dr. Nguyen Phue, Dr. Vu Kun Trung, Mr. Le Xuan Truong, Mrs. Ding Thang Thuyen, Mr. Nguyen Hiep, Mr. Nguyen Ans Tu	Dr. Takahashi, Ms. Watanabe
2	Aug. 1,	11:00 - 12:30	Vietnam National University, Hanoi University of Natural Science	Mr. Nguyen Tien Giang, PhD (Head, Office of Administration & International Relations), Dr. Tran NGOC ANH (Assoc. Prof. Head of Department of Hydrology), Mr. Tran Tri Doi	Mr. Tanaka
3	Aug. 1,	14:00 - 15:00	JETRO	Mr. Jiro Hosono	Mr. Shingo, Mr. Hashimoto
4	Aug. 1,	14:00 - 15:00	Directorate for Roads of Vietnam (Department of Science Technology, Environment and International Cooperation)	Mr. To Nam Toan, Phd (Director General), Mr. Tran Ba Dat (Deputy Director), Mr. Nguyen Hoang Auh (Expert)	Mr. Takagi, Mr. Wakabayashi
5	Aug. 1,	14:00 - 15:00	Singapore Civil Defense Force (SCDF)	Mr. Col Anwar Abdullah (SCDF), Mr. Chen Yong Kai (SCDF), Mr. Nathan Lai Kwok Hwee (Monetary Authority of Singapore(MAS))	Mr. Hashimoto
6	Aug. 1,	16:00 - 17:00	BCM Institute (Singapore)	Dr. Goh Moh Heng	Mr. Hashimoto
7	Aug. 2,	09:00 - 10:00	Ministry of Transport of Viet Nam	Mr. Tran Viet Ha, LLM (Deputy Director General), Mr. Ngo Van Hung (Natural Disaster Mitigation and Search, Rescue Office), Ms. Nguyen Thi Hong (Expert Inland Water way Dept.)	Mr. Takagi, Mr. Wakabayashi
8	Aug. 2,	10:30 - 11:50	Disaster Management Center (DMC), Directorate of Water Resources, MARD	Dr. Nguyen Huu Phuc (Director), Mr. Bui Quang Huy, Head (Information and Statistics Division), Mr. Nguyen Thanh Phuong (Head, Training and Technology Transfer Division)	Mr. Shingo
9	Aug. 2,	11:00 - 12:30	Department of Dike Management and Flood Control (DDMFC)	Dr. Vu Kien Trung (Deputy Director- Head of Standing Office), Mr. Nguyen Hup (Deputy Manager of Flood and Storm Control), Mr. Nguyen Thang (Staff of Flood and Storm Control)	Mr. Tanaka
10	Aug. 2,	14:00 - 15:30	National Center for Hydro-Meteorological Forecasting (NCHMF)	Mr. Vo Van Hoa (Deputy Director of the Center), Mr. Vo Van Ha (Deputy Manager), Mr. Tran Son Tung (Staff), Mr. Nguyen Quec Trinh (Staff), Nguyen Ba Trinh (Manager of Marine Hydro-Meteorological Forecasting Division)	Mr. Tanaka
11	Aug. 2,	15:30 - 16:15	Northern Aviation Authority	Mr. Dong Kien Cuong (Deputy Director), Mr. Dinh Dang Dinh (Deputy Head of Unit)	Mr. Takagi, Mr. Wakabayashi
12	Aug. 2,	15:30 - 16:40	Ministry of Information and Communications (MIC), Vietnam National Institute of Software and Digital Content Industry	Dr. Hoang Le Minh (Director of Institute), Ms. Chu Thai Hoa (Deputy Head of Division, Division of Project and Planning (MSc.))	Mr. Shingo

13	Aug. 2,	16:00 - 16:30	Haiphong People's Committee (HPC)	Dr. Do Trung Thoai (Vice Chairman), Mr. Nguyen Ba Tien (Director, Department of Hai Phong Dyke & Storm/Flood Control), Mr. Duc	Dr. Takahashi, Ms. Watanabe
14	Aug. 5,	09:00 - 10:30	Ministry of Industry and Trade (MOIT)	Mr. Huynh Dac Thang (Deputy Director General of Planning Department), Mr. Cao Anh Dung (Industrial Safety Techniques and Environment Agency, Vice General Director), Ms. Nguyen Thi Hoa (Local Industry Agency, Deputy Head of Industrial Agglomerated Area	Mr. Shingo, Mr. Hashimoto
15	Aug. 5,	09:30 - 10:30	Haiphong Economic Zone Authority (HEZA)	Msc. Tran Vinh Hoan (Vice Chairman), Mr. Nguen Ba Dau (Chief of Enterprise Management), Mr. Dan Sy Tuan (Deputy Head)	Mr. Takagi, Mr. Wakabayashi
16	Aug. 5,	09:00 - 10:30	IGP-VAST (Vietnam Academy of Science and Technology)	Dr. Nguyen Hong Phuong (Deputy Director of Earthquake Information and Tsunami Warning Centre, Institute of Geophysics)	Mr. Segawa
17	Aug. 5,	10:30 - 11:30	Haiphong Department of Transportation	Eng. Dam Xuan Luy (Director)	Mr. Takagi, Mr. Wakabayashi
18	Aug. 5,	10:30 - 11:45	Hai Phong Water Supply One Member Co.	Mr. Nguyen Huu Hop (Deputy Head of Technical Division)	Mr. Tanaka
19	Aug. 5,	13 :40 - 14 :00	Nomura Haiphong Industrial Zone	Mr. Takahito Masuno, President	Dr. Takahashi, Mr. Tanaka, Mr. Takagi, Mr. Wakabayashi, Ms. Watanabe
20	Aug. 5,	14:00 - 15:00	Vietnam Chamber of Commerce and Industry (VCCI)	Mr. Dau Anh Tuan, Ms. Bui Linh Chi	Mr. Shingo, Mr. Hashimoto
21	Aug. 5,	14:10 - 14 :40	Tohoku Pioneer Co., Ltd.	Mr. Kunio Mitobe (General Director), Mr. Shigeyoshi Sato (Deputy general Director, Procurement & Logistics Division), Mr. Nguyen van Dan, Manager (General Affaires and Personnel Section)	Dr. Takahashi, Mr. Tanaka, Mr. Takagi, Mr. Wakabayashi, Ms. Watanabe
22	Aug. 5,	14:50 - 15 :20	Yazaki Haiphong Vietnam Co., Ltd.	Mr. Takashi Kawai (General Director)	Dr. Takahashi, Mr. Tanaka, Mr. Takagi, Mr. Wakabayashi, Ms. Watanabe
23	Aug. 5,	16:00 - 16:30	Petro Vietnam (PVN)	Mr. Dinh The Hung	Mr. Shingo, Mr. Hashimoto
24	Aug. 6,	08:30 - 09:30	North-EastArea'sCenterforHydro-Meteorological Forecasting	Mr. Kguyen Vu Thang, Ph.D (Vice Director)	Mr. Tanaka
25	Aug. 6,	13:30 - 14:10	Ministry of Planning and Investment (MPI), Foreign Investment Agency	Mr. Nguyen Nguyen Dzung (Deputy Director, Investment Promotion Division), Ms. Vu Nhat Ha (Investment Promotion Division)	Mr. Shingo, Mr. Hashimoto
26	Aug. 6,	14:00 - 15:00	Hai Phong Sewerage & Drainage One Member	Mr. VU Trong Quang (Chairman), Mr. Nguyen	Mr. Tanaka

			Limited Company	Van Khao (Deputy Manager of Technical Department), Bui Tuan Vinh (Staff, Technical Department), Nguyen Thi Kim Oauh (Staff, Technical Department)	
27	Aug. 6,	15:30 - 16:30	Department of Hai Phong Dike and Storm/Flood Control	Mr. Duong Van Gang (Dyke Management and Flood Control Division)	Mr. Tanaka, Dr. Takahashi, Ms. Watanabe
28	Aug. 6,	16:00 - 17:00	MOL Logistics (Vietnam) Inc.	Mr. Takuma Kimura (General Manager)	Mr. Shingo, Mr. Hashimoto
29	Aug. 7,	09:00 - 10:00	VSIP	Ms. Keiko Fujita, Mr. Hoang Vinh Tuan	Mr. Takagi, Mr. Wakabayashi
30	Aug. 7,	10:00 - 11:00	Japanese Chamber of Commerce (JBAV)	Mr. Masanori Ogura	Mr. Hashimoto
31	Aug. 7,	10:30 - 11:30	General Statistic Office (GSO)	Ms. Nguyen Thi Ngoc Van (General Statistical Department), Ms Phi Hong Nga (Construction and Investment Capital Statistical Department), Mr. Luu Dinh Quy (Industrial Statistical Department)	Mr. Shingo, Mr. Hashimoto
32	Aug. 7,	13:30 - 14:30	NYK line (Vietnam) Co.,Ltd	Mr. Nguyen Chi Quan	Mr. Matsumoto (JICA), Mr. Takagi
33	Aug. 7,	15:00 - 16:00	Vietnam Automobiles Transport Association, Haiphong Inland Goods Transport Association	Le Van Tien,	Mr. Matsumoto (JICA), Mr. Takagi
34	Aug. 7,	15:00 - 16:00	Hai Phong Department of Planning and Investment (DPI)	Ms. Hoang Thi Lien (Vice Manager, External Economics Division), Mr. Nguyen Thanh Son, Ms. Nguyen Thi Thuy Ha (Staff, External Economics Division)	Mr. Shingo, Mr. Hashimoto
35	Aug. 8,	08:00 - 09:30	Department of Industry and Trade in Hai Phong, Division of Technical Safety and Environment	Teuong Quoc Dai (Deputy Manager Division of Technical Safety and Environment), Ms. Le Ngoc Yen (Deputy Manager, Division of Industry), Ms. Nguyen Thuy Hong (Staff, Division of Technical Safetly and Environment)	Mr. Shingo, Mr. Hashimoto
36	Aug. 8,	14:00 - 14:30	Hai Phong Fire Prevention Department	Mr. Pham Van Dat, Mr. Doan Hong Chien	Mr. Shingo, Mr. Hashimoto
37	Aug. 8,	14:50 - 15:30	Hai Phong Port Holding Limited Liability	Mr. Truong Van Thai (Deputy General Director), Mr. Le Minh Hai (Vice Manager, Business Development)	Mr. Matsumoto (JICA), Mr. Shingo, Mr. Hashimoto
38	Aug. 8,	15:45 - 17:20	VCCI Vietnam (Hai Phong)	Mr. Phan Cong Minh, Mr. Phi Trong Duc, Mr. Tran Tuan Khanh, Mr. Vu Xuan Binh	Mr. Shingo, Mr. Hashimoto