Country Report

Vietnam

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

March 2015

AHA CENTRE

Japan International Cooperation Agency

OYO International Corporation
Mitsubishi Research Institute, Inc.
CTI Engineering International Co., Ltd.

Overview of the Country

Basic Information of Vietnam [1), 2), 3)]

National Flag

Country Name	Long form: Socialist Republic of Vietnam Short form: Vietnam
Capital	Hanoi
Area (km²)	Total : 330,951 Land : 310,070 Inland Water : 20,881
Population	89,708,900
Population density (people/km² of land area)	289
Population growth (annual %)	1.0
Urban population (% of total)	32
Languages	Vietnamese
Ethnic Groups	Kinh (Viet) constitutes approx. 86% of the population. Also, there are about 53 ethnic minority groups.
Religions	Buddhism, Catholic, Cao Dai, and others
GDP (current US$) (billion)	171
GNI per capita, PPP (current international $)	5,030
GDP growth (annual %)	5.4
Agriculture, value added (% of GDP)	18
Industry, value added (% of GDP)	38
Services, etc., value added (% of GDP)	43

Brief Description

Vietnam is located on the eastern part of the Indochina peninsula, with a long strip of land stretching north to south. Vietnam is bordered by China to the north, and by Laos and Cambodia to the west. The Mekong River, the largest river in South-East Asia, flows through the south of Vietnam, and Ho Chi Minh City, the largest city in Vietnam, is located at the mouth of the river.

Vietnam joined ASEAN on July 28, 1995. It had been a one-party state dominated by the Communist party until it joined ASEAN and changed its foreign policy.

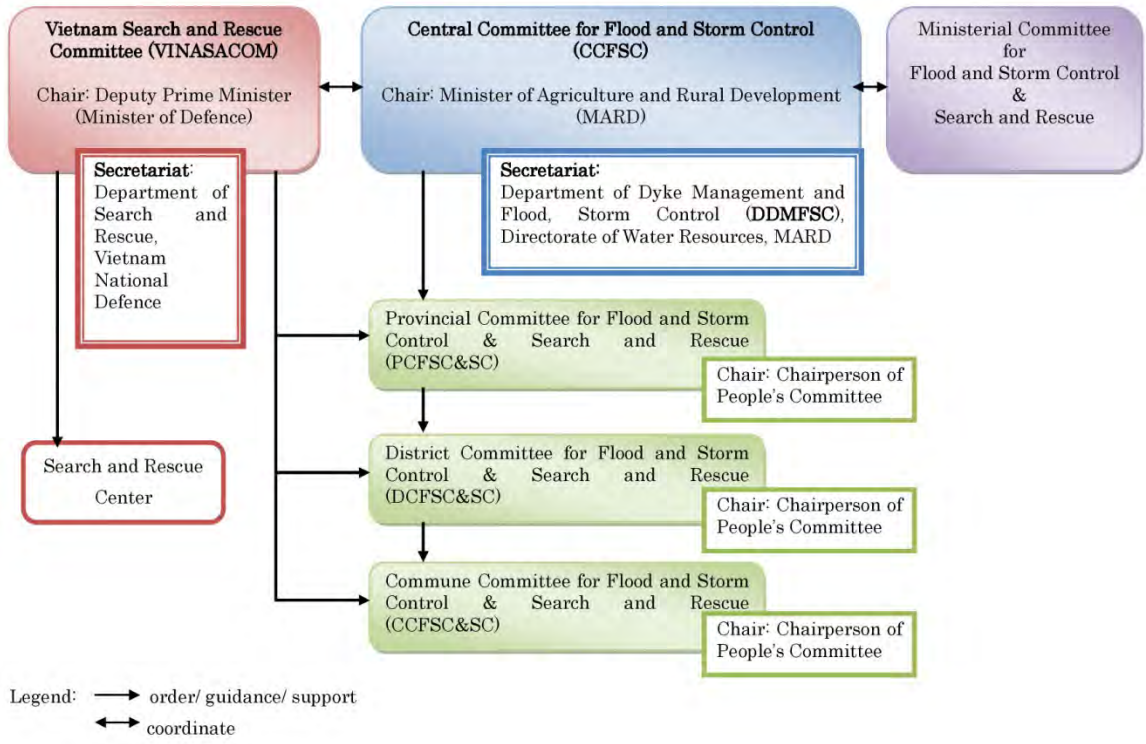
Vietnam is a socialist republic with a one-party system led by the Vietnamese Communist Party. Truong Tan Sang is the current president of the country. The country created a competitive economic environment since Doi Moi policies were adopted in 1986. The country is still undergoing significant development today, and foreign countries are trying to expand their business presence in Vietnam.

Natural Hazards

The Storm and floods are the frequent disasters (storm: 52%, flood: 42% of the total number of disasters)

in Vietnam that caused 92% of the total affected people (storm: 59%, flood: 33%), 98% of total deaths (storm: 68%, and flood: 30%), and 92% of estimated cost (storm: 50%, flood: 42%). Storm and flood are the most noteworthy disasters in Vietnam.

Disaster Management Structure [4)]



References:

1) Central Intelligence Agency (CIA) website (2014): https://www.cia.gov (Accessed: October 15, 2014)
2) Ministry of Foreign Affairs website (2014): http://www.mofa.go.jp (Accessed: October 15, 2014)
3) The World Bank Data Bank website (2013): http://data.worldbank.org (Accessed: October 15, 2014)
4) Japan International Cooperation Agency (JICA) (2012): Data Collection Survey on ASEAN Regional Collaboration in Disaster Management

Contents

Overview of the Country

1. Introduction

This report is the first version of the Country Report for Vietnam, which gives information on natural disaster risks of the country, industrial parks, major traffic infrastructure and lifeline utilities, and legislative systems relating to disaster management and business continuity.

The country report is prepared as a reference document for individuals and organizations who are wishing to integrate disaster risk information for their decisions: such as investment to Vietnam, preparation of a business continuity plan (BCP) or disaster management plan of their organization, preparation of an Area Business Continuity Plan (Area BCP) of their area, and simply knowing natural disaster risks of their area.

Information contained in this report is macroscopic covering the entire country at the same level. When detailed risk information is necessary, hazard and risk assessments for an area of inters are required.

Since the country report was prepared with limited data and information as one of the components of the project[1] of ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management (AHA Centre) and Japan International Cooperation Agency (JICA) with a limited data and information, a revision by national experts is required for further refinement.

The following are reference documents prepared by the project of AHA Centre and JICA.

1. AHA Centre and JICA (2015): Planning Guide for Area Business Continuity, Area BCM Took Kits, Version 2.

2. AHA Centre and JICA (2015): The Country Reports; Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Thailand and Singapore.

3. AHA Centre and JICA (2015): The Risk Profile Reports; Karawang and Bekasi of Indonesia, Cavite, Laguna and the Southern Part of Metropolitan Manila of the Philippines, and Haiphong of Vietnam.

[1] AHA Centre and JICA (2015), Natural Disaster Risk Assessment and Area Business Continuity Plan Formulation for Industrial Agglomerated Areas in the ASEAN Region, , 2013 to 2015.

2. Natural Disaster Risks

2.1 Predominant Hazards

In Vietnam, natural disaster risks are generally classified as follows:

Table 2.1 Natural Disaster Risks in Vietnam

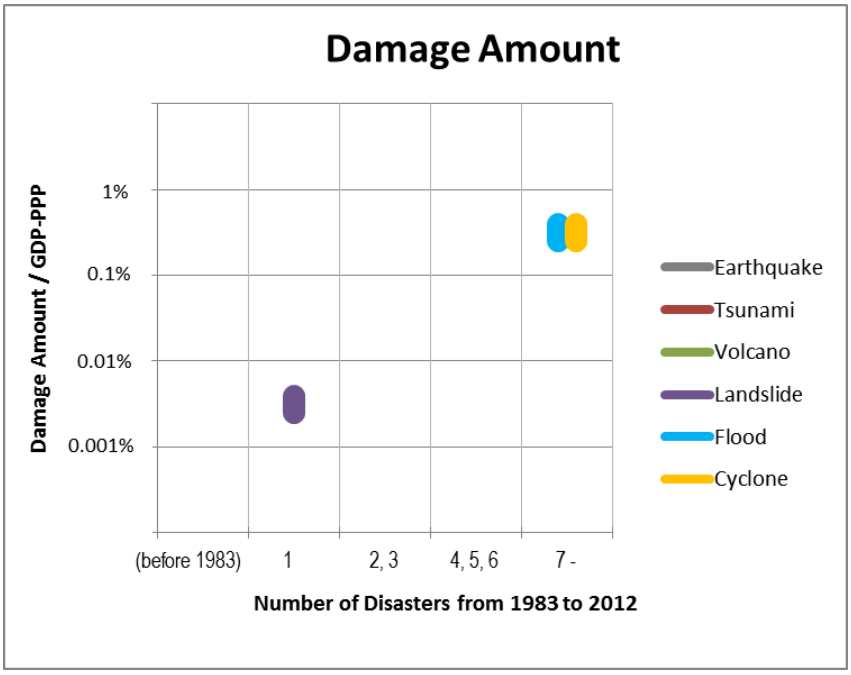
High Risk	Medium Risk	Low Risk
Flood	Hail rain / tornado	Earthquake
Typhoon	Drought	Accident (Technology)
Inundation	Landslide	Frost
	Flash flood	Damaging cold
	Deforestation	

Source: The World Bank, Vietnam, Increasing Resilience to natural Hazards and Climate Change

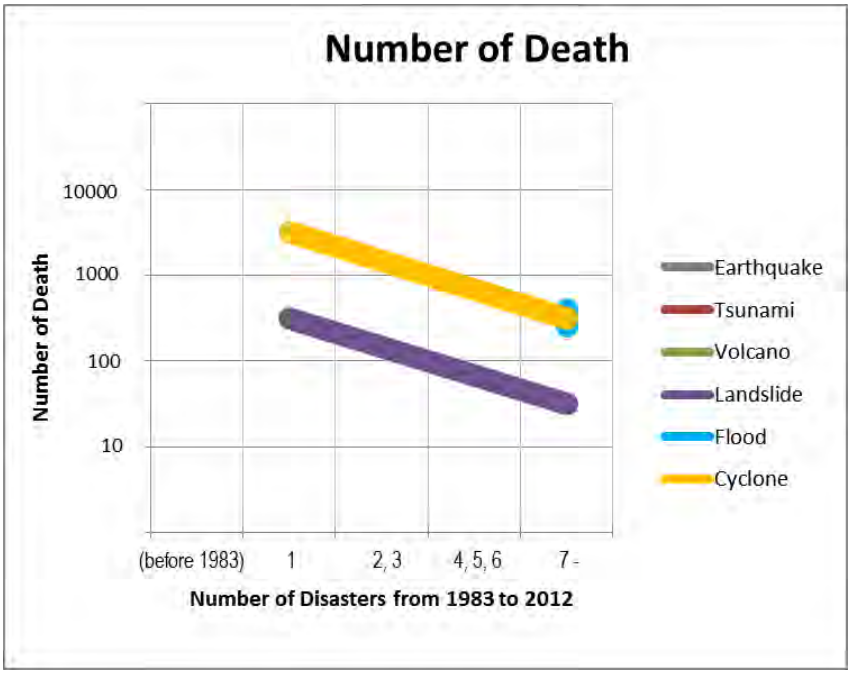
The records of natural disasters that have affected Vietnam are classified based on the impact and frequency of occurrence in Figure 2.1. Both "damage amount" and "number of deaths" are used to express the impact, and "number of disasters occurred between 1983 and 2012" is used to represent the frequency of occurrence.

Figure 2.1 can be used to see the relative level of risk of natural hazards in Vietnam according to their impacts and frequency of occurrence. Descriptions of each hazard are given in Section 2.2 to Section 2.7.

Please note that the figure was prepared by the available existing information, and not all information relating to the impacts of disasters was included. Further collection of information and discussion among experts of Vietnam will be necessary to improve on the information represented in Figure 2.1.



Note: GDP-PPP, Gross domestic product based on purchasing-power-parity (PPP) valuation of country GDP, International Monetary Fund, World Economic Outlook Database, October 2012



Source of data and information:

EM-DAT, The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium: http://www.emdat.be.
Pacific Rim Coordination Center Disaster Data: http://data.pacificrimnetwork.org/.
Global Unique Disaster Identification Number: http://www.glidenumber.net/glide/public/search/search.jsp.
National Geophysical Data Center (NGDC), National Oceanic and Atmospheric Administration (NOAA): http://ngdc.noaa.gov/hazard/hazards.shtml
Dartmouth Flood Observatory, University of Colorado: http://floodobservatory.colorado.edu/

Figure 2.1 Impact of Natural Hazards in Vietnam

2.2 Flood

Risks

In Vietnam, floods occur in the rainy season (June to November) influenced by the tropical monsoons, and also during the typhoon season (September to October) in the northern and central part areas where typhoons land. Storm rainfalls in the upper basin of the Mekong cause flood disaster over wide areas in the Mekong delta.

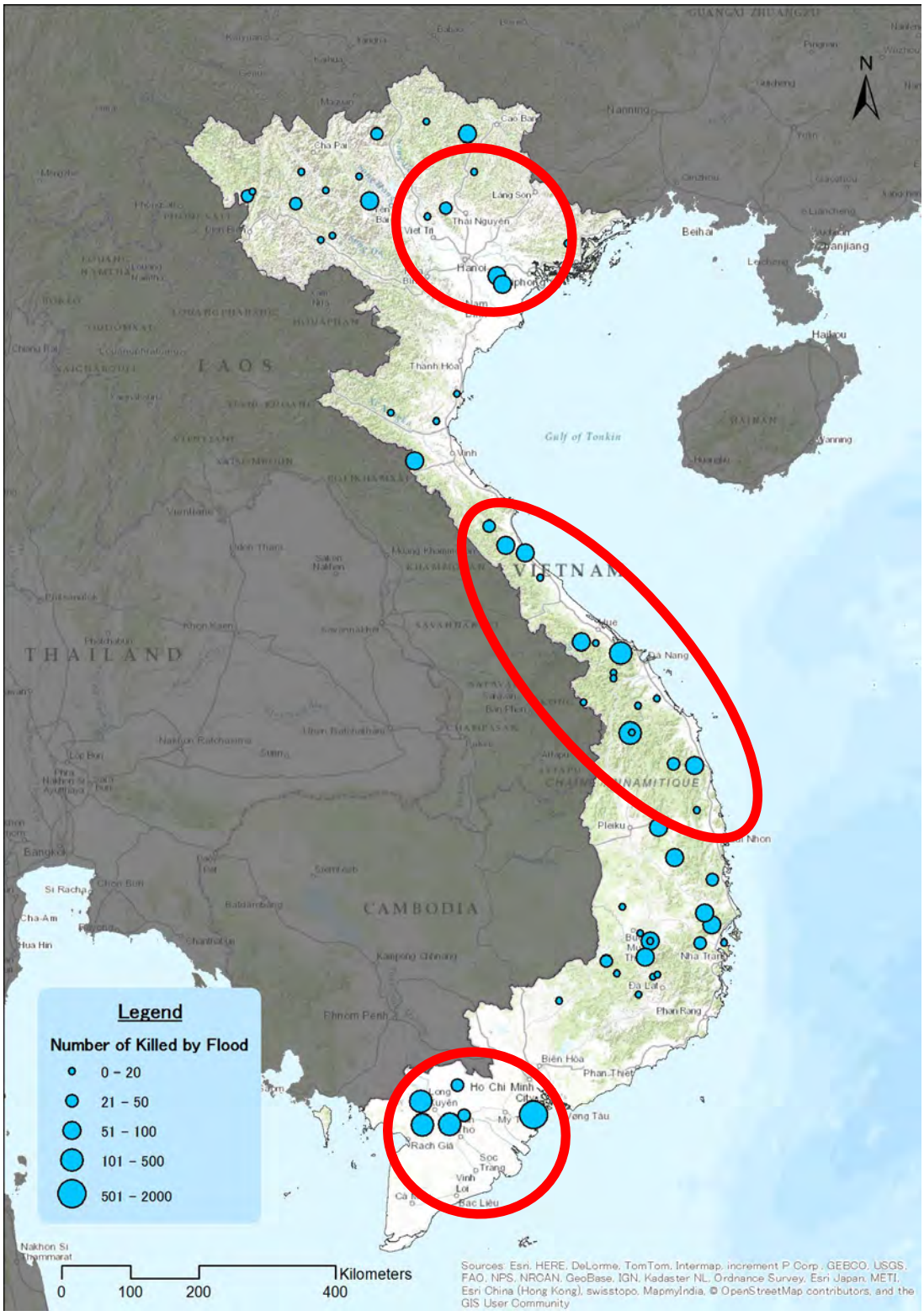
Figures 2.2 and 2.3 show locations of flood disasters recorded during 1983 and 2012. Scale of the disasters is expressed by human losses and economic losses.

Hot spots are of flood disasters include:

- Northern area: Red River Delta and its vicinity
- Central area: Coastal area
- Southern area: Mekong River Delta and its vicinity

Recent flood disasters are:

- The flood on September 30, 2011 triggered by the storm rainfalls of Typhoon Nesat caused damage in the central areas, and flooding from the Mekong River caused damage in Ho Chi Minh and its surrounding area.
- The flood on October 3, 2010 triggered by a typhoon that hit the central region caused severe flood damage including collapsed houses, dyke breaches, and damage to agricultural crops in Ha Tinh Province and its surrounding area.
- The flood of September 2000 was caused by storm rainfalls in Laos in the upper basin of the Mekong River. The Mekong River caused flood damage at the various areas of Long An, Kien Giang, An Giang, Can Tho, and Dong Thap provinces. The total economic losses were estimated at about USD 250 million. According to the Vietnam Red Cross, there were about 800,000 flooded homes and the duration of the inundation was about one month.
- The flood of November 2008 triggered by the storm rainfalls of three days from November 1 caused the worst flood damage in the last 20 years in the capital of Hanoi and its surrounding area, as well as 17 provinces in the central region. The economic losses were estimated at about USD 400 million.

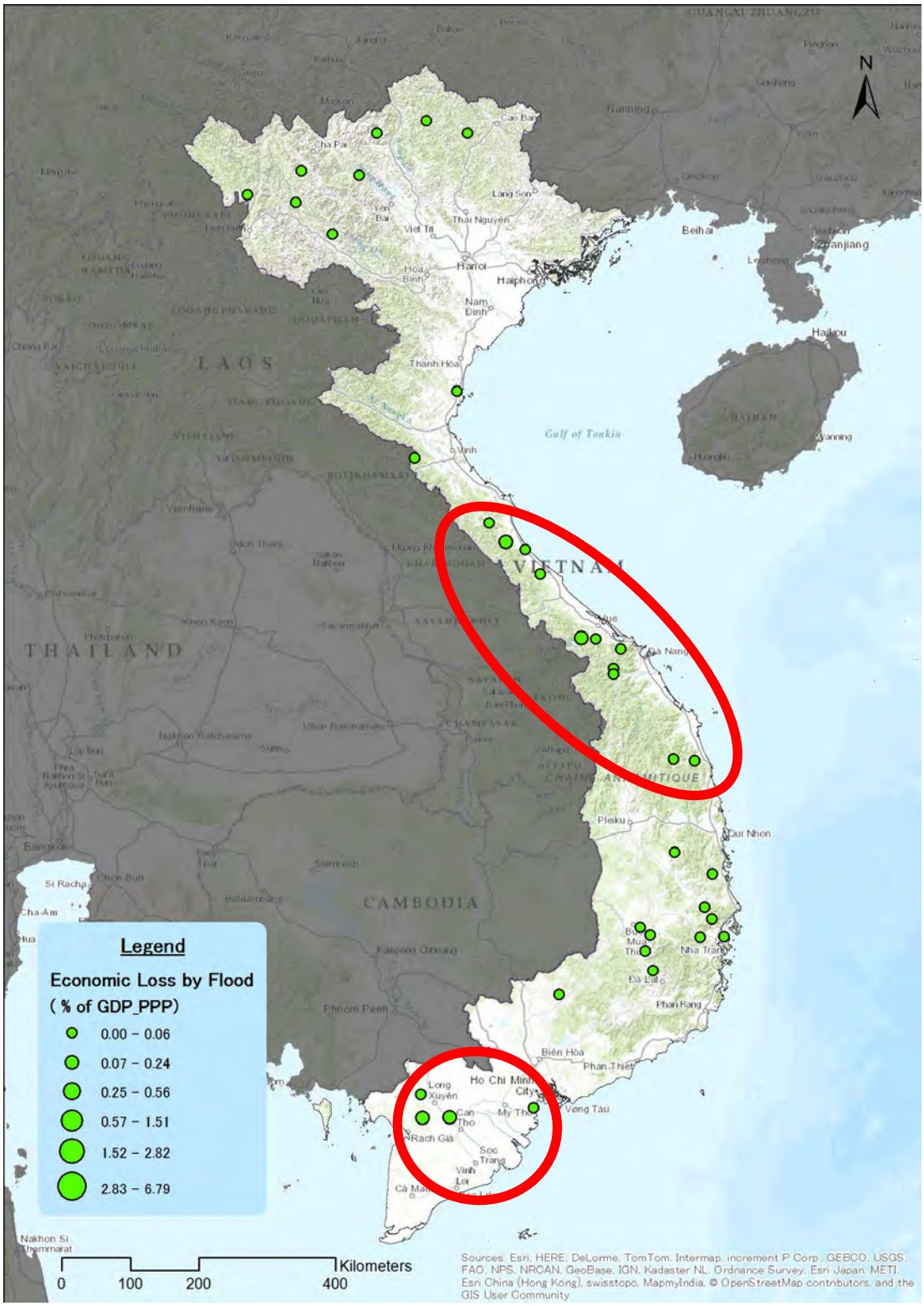


: Hot Spots

Data Sources:

EM-DAT, The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium: http://www.emdat.be.
Pacific Rim Coordination Center Disaster Data: http://data.pacificrimnetwork.org/.
Global Unique Disaster Identification Number: http://www.glidenumber.net/glide/public/search/search.jsp.

Figure 2.2 Locations of Flood Disasters in Vietnam: Human Losses



: Hot Spots

Data Sources:

EM-DAT, The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium: http://www.emdat.be.

Pacific Rim Coordination Center Disaster Data: http://data.pacificrimnetwork.org/.

Global Unique Disaster Identification Number: http://www.glidenumber.net/glide/public/search/search.jsp.

Figure 2.3 Locations of Flood Disasters in Vietnam: Economic Losses (% of GDP)

Background

In Vietnam, floods are caused by very strong rainfall during monsoons in the rainy season (June to November). Large scaled floods are caused by typhoon landing during the typhoon season of July to October.

The Red River in the northern area has a basin with a large mountainous region. Here, floods are caused by a rapid increase in the river level. Along the coastline in the northern, flood damage tends to be increased by storm surges.

In the central part of Vietnam, the coastal river basins where the mountainous region is close to the coastal area, floods are caused due to a sudden increase of river water levels.

The Mekong River Basin in the southern area has a wide and long basin, and an extensive flat plain in the lower reach. The Mekong River causes prolonged flood damage. At the river mouth in the southern area, the subsidence caused by pumping groundwater would cause flood damage more serious.

Flood disasters in urban areas like Hanoi and Ho Chi Minh City tend to be amplified because of their poor drainage systems.

Sources of Hazard and Risk Information

Table 2.2 Sources of Hazard and Risk Information: Flood

Ministry of Agriculture and Rural Development (MARD)
http://www.agroviet.gov.vn/en/Pages/default.aspx
Central Committee for Flood and Storm Control (CCFSC)
http://www.ccfsc.gov.vn/KW367A21/Trang-chu.aspx
Committee for Flood and Storm Control (CFSC)
http://www.ccfsc.gov.vn/KW367A21/Trang-chu.aspx
National Hydro-Meteorological Services of Viet Nam (NHMS)
http://www.nchmf.gov.vn/web/en-US/43/Default.aspx
Vietnamese Academy of Science and Technology (VAST)
http://www.vast.ac.vn/en/
Hanoi University Science and Technology (HUST)

http://en.hust.edu.vn/home;jsessionid=3B761135553EC65597E3EA1F1D2C6F2C
Ho Chi Minh City - University of Technology
http://www.hcmut.edu.vn/en

Studies on Hazard and/or Risk Assessment

Some useful studies on flood hazard, risk, and vulnerability are publicly available presenting assessment results, case studies of countermeasures, as well as different methodological approaches. There are a few types of methodologies to assess risks and vulnerability including, for example, risks involving exposure to flooding events and population density. Vulnerability can be defined as a function of exposure, adaptive or coping capacity, and land-use etc. There are slightly different combinations of these factors with different studies for use. Therefore, these concepts must be defined in advance to plan a methodology for an assessment, in terms of which definitions are to be used in a certain analysis.

Locations of existing investigations and studies on flood are shown in Figure 2.4. Outline of those investigations and studies are attached in Appendix 2 and their summary is given in Table 2.3.

Table 2.3 Summary of Existing Investigations and Studies: Flood

Country/Region	Summary of Existing Studies and Reports
ASEAN	There are a few reports that study natural disasters for ASEAN and the Pacific regions at large in recent years. Disaster risks are assessed by scenario, exposure, vulnerability, damage, and loss. An assessment framework is also sought to give an overview of risks, hazard and vulnerability.
Vietnam	A relatively large number of studies and assessments are publicly available for Vietnam. Hazard and risk assessments are conducted using MIKE11 for the Hoang Long River basin. Simulations of the magnitude of floods are conducted for 5, 10, 20, 50, 100, and 200 year return periods. For the Thach Han River basin, an analysis was also made using hydraulic models with MIKE and socioeconomic data. This combination of statistical analysis and social surveys made flood vulnerability assessment possible.

Figure 2.4 Locations of Existing Investigations and Studies: Flood

References for Data and Further Reading

1) Arief Anshory Yusuf & Herminia Francisco (2009), Climate Change Vulnerability Mapping for Southeast Asia, Singapore: EEPSEA
2) Asian Disaster Preparedness Center (2011), Program for Hydro-Meteorological Disaster Mitigation in Secondary Cities in Asia (PROMISE) 2005 to 2010: Bangkok
3) ADRC: "Countries; Viet Nam", Information on Disaster Risk Reduction of the Member
4) ADRC: "Viet Nam, Typhoon, Flood,2011/09/30"
5) ADRC: "Viet Nam, Flood, 2010/10/03"
6) ADRC: "Viet Nam, Floods ,2008/11/01"
7) ADRC: "Viet Nam, Flood, 2000/09"
8) DangDinhKha et al (2010), Flood Vulnerability Assessment of Downstream Area in Thach Han River Basin, Quang Tri Province: Hanoi University of Science, Vietnam National University, Hanoi
9) Ministry of Foreign Affairs of Japan (2013): "Information on Viet Nam (in Japanese)",07 2013
10) OCHA (2011):"Southeast Asia; Flooding (12 October 2011)"
11) Relief Web; OCHA (2011):"Viet Nam Red Cross appeals for 1.1 million Swiss francs for flood response", Report from IFRC, 10 Nov 2011.
12) Relief Web; OCHA (2010): "ESTIMATED RAINFALL ACCUMULATION IN VIET NAM: ESTIMATED TOTAL RAINFALL ACCUMULATION FOR THE PERIOD: 1 - 6 OCTOBER 2010", Map from International Charter, UNOSAT, 07 Oct 2010.
13) Relief Web; OCHA (2010): "Viet Nam Situation Report No. 10 Floods Central Vietnam", Report from UN Country Team in Viet Nam, Oct 2010.
14) Relief Web; OCHA (2010): "South East Asia: millions affected by six natural disasters", Report from IFRC, 28 Oct 2010
15) Relief Web; OCHA (2008): "North Vietnam loses over $370.5 million in flood", Report from Government of Viet Nam, 12 Nov 2008
16) Relief Web; OCHA (2000): "Viet Nam: Floods and Storm Appeal No. 23/00, Situation Report No. 2", Report from IFRC, 31 Oct 2000.
17) Relief Web; OCHA (2000): Report from UN Children's Fund ,UNICEF Humanitarian Action: Vietnam Donor Update 27 Oct 2000, 27 Oct 2000

18) Royal Haskoning, Deltares, Unesco-IHE. (2009), Flood Risk Management in the Border Zone between Cambodia and Vietnam: The Mekong River Commission Secretariat
19) Shigenobu Tanaka et al (2010), Progress Report on Flood Hazard Mapping in Asian Countries. PWRI.
20) TawatchaiTingsanchali (2010), Flood Hazard and Risk Assessment of Hoang Long River Basin, MIKE by DHI
21) UNITED NATIONS: "Flood Central Viet Nam October 26, 2010 -5pm(Viet Nam time) ",Viet Nam Situation Report No.10
22) Velasquez, Jerry et al (ed.) (2012), Reducing vulnerability and exposure to disasters: Asia-Pacific disaster report 2012, ESCAP/UNISDR AP
23) World Bank (2011), Advancing Disaster Risk Financing and Insurance in ASEAN Countries: Framework and Options for Implementation, Washington: Global Facility for Disaster Reduction and Recovery
24) World Bank, UNISDR (2010), Synthesis Report on Ten ASEAN Countries Disaster Risks Assessment.

2.3 Earthquake

Risks

Earthquakes less than magnitude 7 have been recorded in Vietnam. One earthquake that occurred offshore of Ham Tan in 1923 was caused by volcanic eruption. However, there is no record of the earthquakes over magnitude 7 or damage caused by earthquakes in recent years.

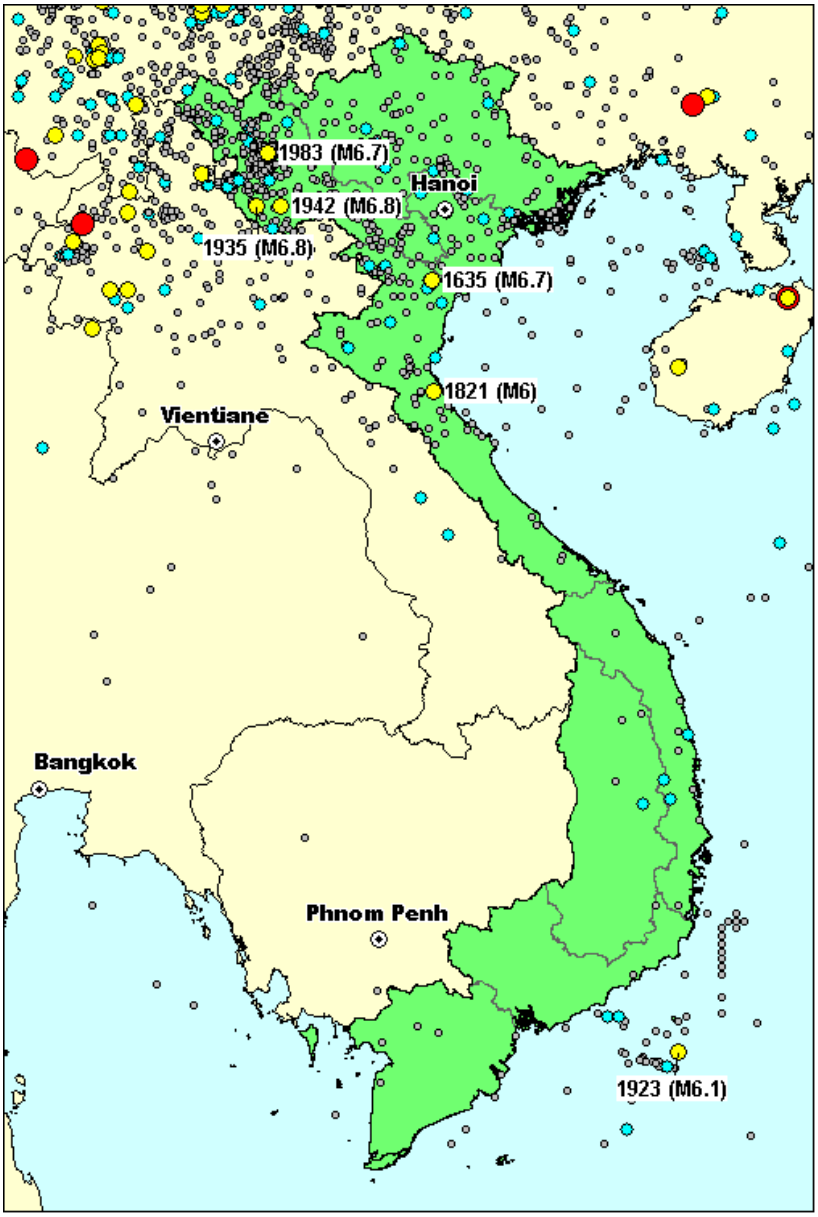
Background

There are many faults in the northern region of Vietnam and more earthquakes occurred there than in middle and southern regions of Vietnam (Figure 2.5).

Figure 2.6 is the earthquake hazard map of Vietnam that considers all types of earthquakes and their probabilities. This figure shows that an earthquake larger than MMI VI or VII is expected for the northern region and an earthquake larger than MMI V is expected for the middle and southern regions at 20% probability in 50 years.

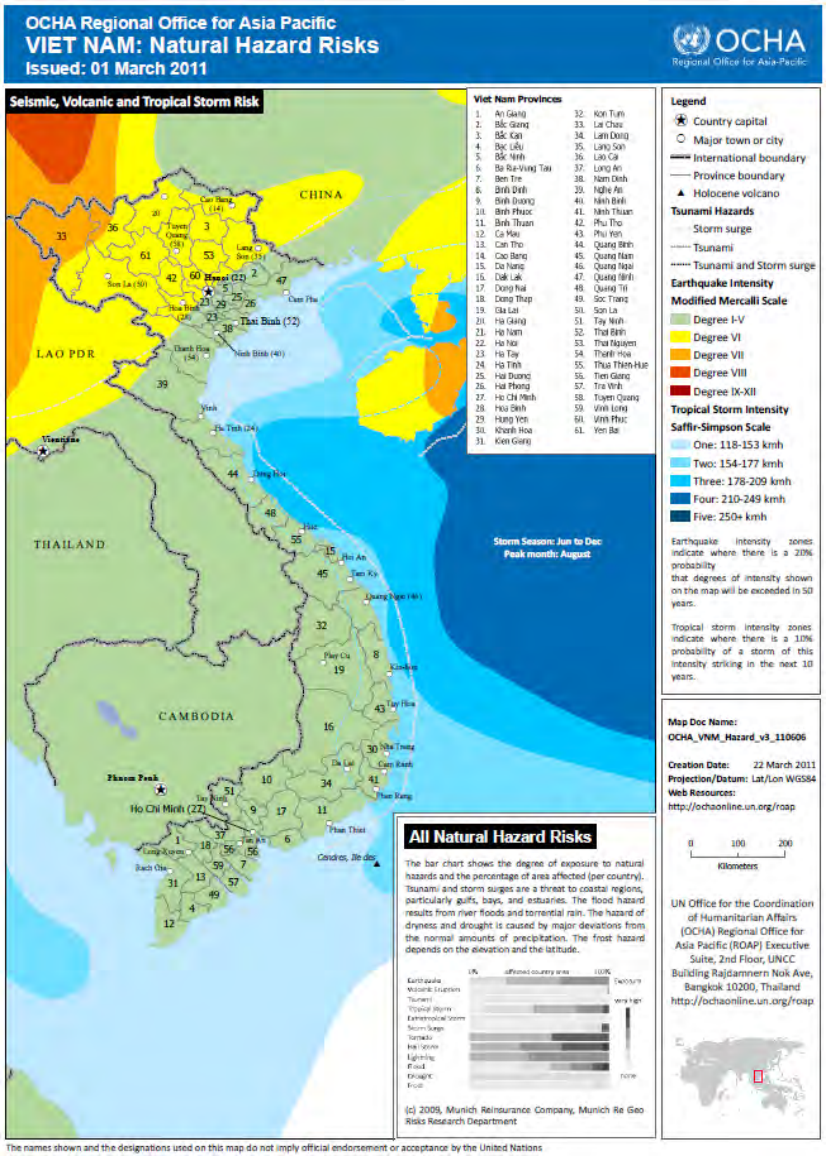
Responses by Vietnam

Earthquakes in and around Vietnam are observed by the Vietnam National Seismic Network (VIETNET). The network consists of 25 short-period sensors and 5 broadband sensors, and it covers all areas of Vietnam with a focus on the northern region. There is a plan to add broadband sensors. Telecommunications systems are in operation in the Hanoi area.



Data Sources: IGP-VAST

Figure 2.5 Historical Earthquakes



Data Sources: OCHA

Figure 2.6 Seismic Hazards in Vietnam

Sources of Hazard and Risk Information

Table 2.4 Sources of Hazard and Risk Information: Earthquake

Institute of Geophysics, Vietnam Academy of Science and Technology (IGP-VAST)
http://www.igp-vast.vn/
Vietnam Academy of Science and Technology (VAST)
http://www.vast.ac.vn/

Reports on Hazard and/or Risk Assessment

Useful information and studies on earthquake hazard, risk, and vulnerability were collected from resources available in the public domain including websites. The information and studies include methodologies with analysis and assessment.

There is no standardized or authorized methodology for risk and vulnerability assessment. Therefore, the methodology should be selected or updated in accordance with the purpose when risk and vulnerability assessments are required.

Locations of existing investigations and studies on earthquakes are shown in Figure 2.7. Outline of those investigations and studies are attached in Appendix 2 and their summary is given in Table 2.5.

Table 2.5 Summary of Existing Investigations and Studies: Earthquake

Country/Region	Summary of Existing Studies and Reports
ASEAN	There are natural hazard assessment reports for ASEAN region created by international organizations like World Bank etc. They summarize frequency, vulnerability, loss, and others subject for each disaster. Some reports describe the methodology and assessment points/items.
Vietnam	There is no record of earthquake disaster in Vietnam and no investigations or studies limited to this country and its regions are found.

References for Data and Further Reading

1) EM-DAT: The OFDA/CRED International Disaster Database – www.emdat.be – Université Catholique de Louvain – Brussels – Belgium.
2) Japan International Cooperation Agency (JICA) (2012): "Data Collection Survey on ASEAN Regional Collaboration in Disaster Management"
3) OCHA-ROAP (2011). VIET NAM: Natural Hazard Risks
4) United Nations Office for the Coordination of Humanitarian Affairs (OCHA), Regional Office for Asia Pacific (ROAP) (2011): "Viet Nam: Natural Hazard Risks", Downloaded from http://reliefweb.int/sites/reliefweb.int/files/resources/map_1322.pdf
5) USGS (2009). Seismic Hazard of Western Indonesia

Figure 2.7 Locations of Existing Investigations and Studies: Earthquake, Tsunami and Volcano

2.4 Tsunami

Risks

Due to its location, it is difficult for the Vietnamese coast to be affected by destructive tsunamis originating in the central Pacific Ocean, the Sea of Japan, and East China Sea on its northeast side, or from the Sunda Trench or the Philippine Trench. In fact, there is no record of damage caused by tsunamis.

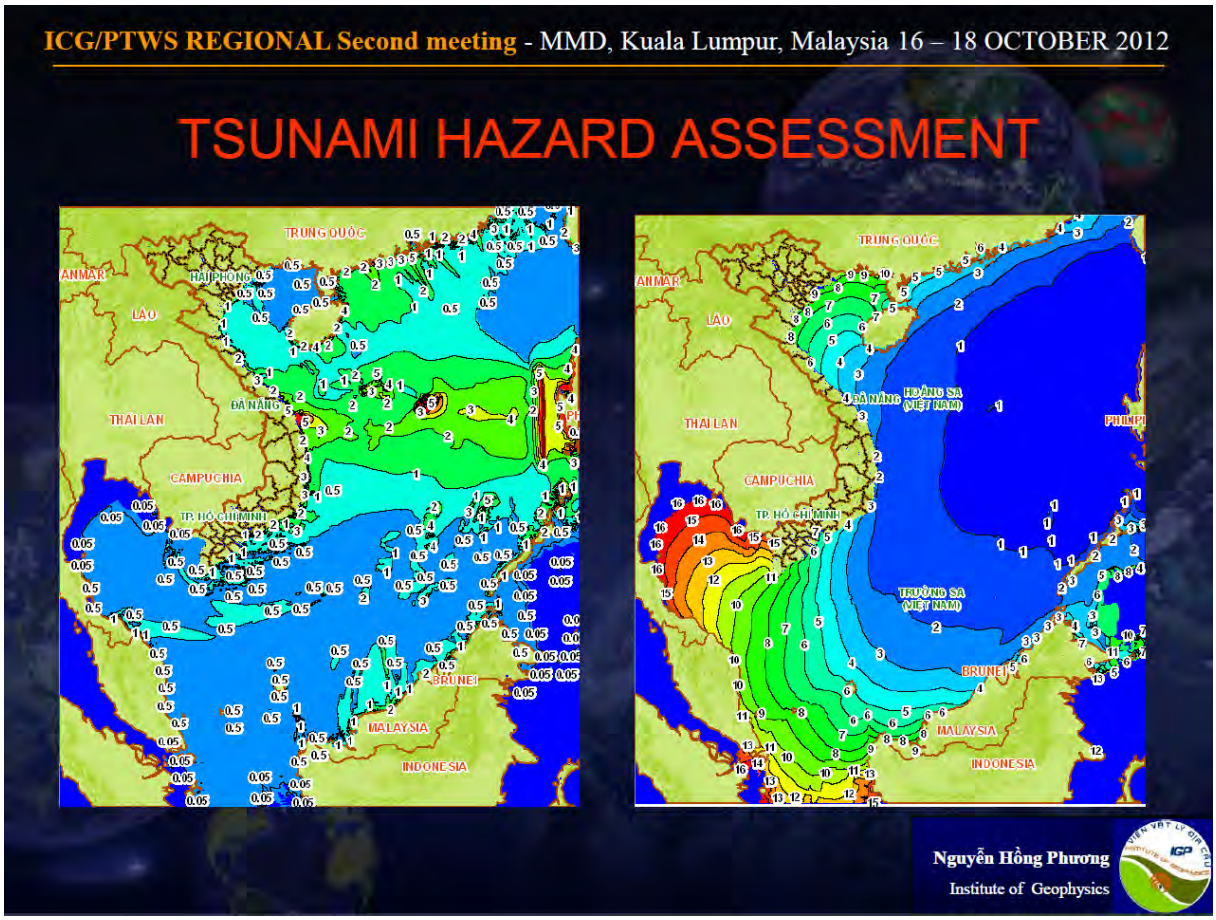
Background

However, tsunami threats might come from inside the East Vietnam Sea, according to experts. Recent research results show that the maximum expected earthquake magnitude for the Manila Trench may reach M8.7, with a tsunami, up to 5 m in height can reach the Vietnamese coast in 2 hours at the earliest from the source region (See Figure 2.8).

Responses by Vietnam

The Institute of Geophysics (IGP) is in charge of tsunami early warning. IGP has established the Earthquake Information and Tsunami Warning Center and is monitoring tsunamis that may cause damage to Vietnam 24 hours/day. Once a tsunami occurs, the center issues an early warning. The warning is transmitted directly to Da Nang city and it is disseminated to the citizens through the ten (10) sirens which are installed in the city. The warning is transmitted to other relevant agencies and organizations, but there are no other areas in which a means of communication to the citizens is established.

A drill on tsunami response was conducted in Da Nang city in 2011.



Data Source: IGP-VAST

Figure 2.8 Tsunami Hazard Assessment for Vietnam

Sources of Hazard and Risk Information

Table 2.6 Sources of Hazard and Risk Information: Tsunami

Institute of Geophysics, Vietnam Academy of Science and Technology (IGP-VAST)
http://www.igp-vast.vn/
Vietnam Academy of Science and Technology (VAST)
http://www.vast.ac.vn/

Reports on Hazard and/or Risk Assessment

Useful information and studies on tsunami hazard, risk, and vulnerability were collected from resources available in the public domain including websites. The information and studies include methodologies with analysis and assessment.

There is no standardized or authorized methodology for risk and vulnerability assessment. Therefore, methodology should be selected or updated in accordance with the purpose when risk and vulnerability assessment are required.

Locations of existing investigations and studies on tsunami are shown in Figure 2.7. Outline of those investigations and studies are attached in Appendix 2 and their summary is given in Table 2.7.

Table 2.7 Summary of Existing Investigations and Studies: Tsunami

Country/Region	Summary of Existing Studies and Reports
ASEAN	Tsunami induced by the Sumatra earthquake on December 26, 2004 caused major damage to ASEAN countries. The disaster is summarized by organizations like ADB.
Vietnam	There is no record of tsunami disaster in Vietnam and no investigations or studies limited to this country and its regions were found.

References for Data and Further Reading

1) ADB (2005). From Disaster to Reconstruction: A Report on ADB's Response to the Asian Tsunami
2) EM-DAT: The OFDA/CRED International Disaster Database – www.emdat.be – Université Catholique de Louvain – Brussels – Belgium.
3) Japan International Cooperation Agency (JICA) (2012): "Data Collection Survey on ASEAN Regional Collaboration in Disaster Management"
4) Nguyen Hong Phuong (2012): "Vietnam National Progress Report", Centre for Earthquake Information and Tsunami Warning, Institute of Geophysics, VAST, ICG/PTWS REGIONAL Second meeting -MMD, Kuala Lumpur, Malaysia 16 –18 OCTOBER 2012

2.5 Volcanoes

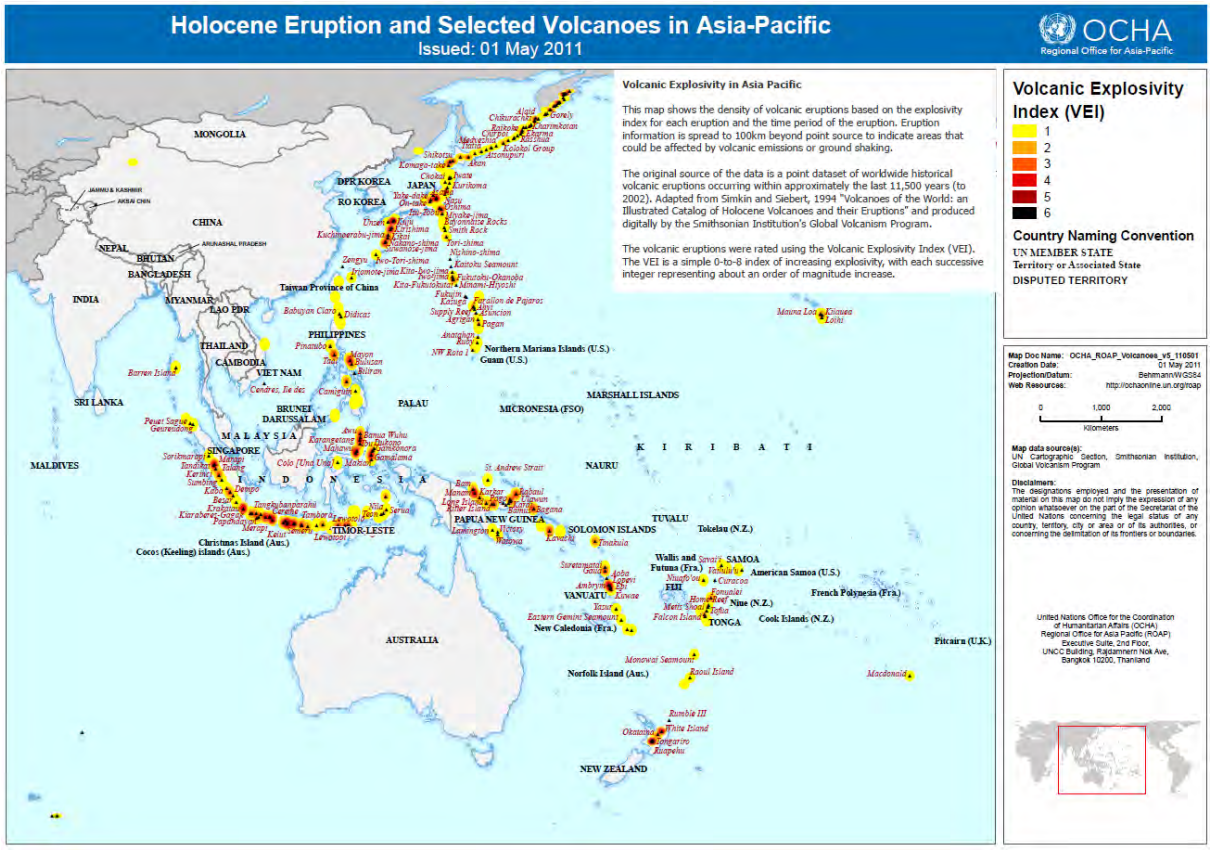
Risks

Risks from volcanic eruption are low in Vietnam.

Background

There are 4 inland volcanoes including the Cu-Lao Re Group, Toroeng Prong, Haut Dong Nai, and Bas Dong Nai, and 2 undersea volcanoes including the Ile des Cendres and Veteran. Ile des Cendres erupted in 1923 and there is evidence that other volcanoes erupted in the age of Holocene (from 12,000 years ago to present), with the exception of Veteran. However, there is no record of damage caused by the eruptions.

Figure 2.9 shows the volcanic activity in the Asia-Pacific area including Vietnam.



Data Source: OCHA

Figure 2.9 Holocene Eruption and Selected Volcanoes in Asia-Pacific

Responses by Vietnam

No special measures are taken focusing on volcanoes.

Sources of Hazard and Risk Information

Table 2.8 Sources of Hazard and Risk Information: Volcano

Institute of Geophysics, Vietnam Academy of Science and Technology (IGP-VAST)
http://www.igp-vast.vn/
Vietnam Academy of Science and Technology (VAST)
http://www.vast.ac.vn/

Reports on Hazard and/or Risk Assessment

Useful information and studies on volcanic hazard, risk, and vulnerability were collected from resources available in the public domain including websites. The information and studies include methodologies for analysis and assessment.

There is no standardized or authorized methodology for risk and vulnerability assessment. Therefore, methodology should be selected or updated in accordance with the purpose when risk and vulnerability assessment are required.

Locations of existing investigations and studies on volcanic hazards are shown in Figure 2.7. Outline of the investigations and studies are attached in Appendix 2 and their summary is given in Table 2.9.

Table 2.9 Summary of Existing Investigations and Studies: Volcano

Country/Region	Summary of Existing Studies and Reports
ASEAN	UNOCHA summarized the scale of the explosion of volcanoes around the Asia-Pacific region using the Volcanic Explosivity Index (VEI).
Vietnam	There is no record of volcanic disaster in Vietnam and no investigations or studies limited to this country and its regions were found.

References for Data and Further Reading

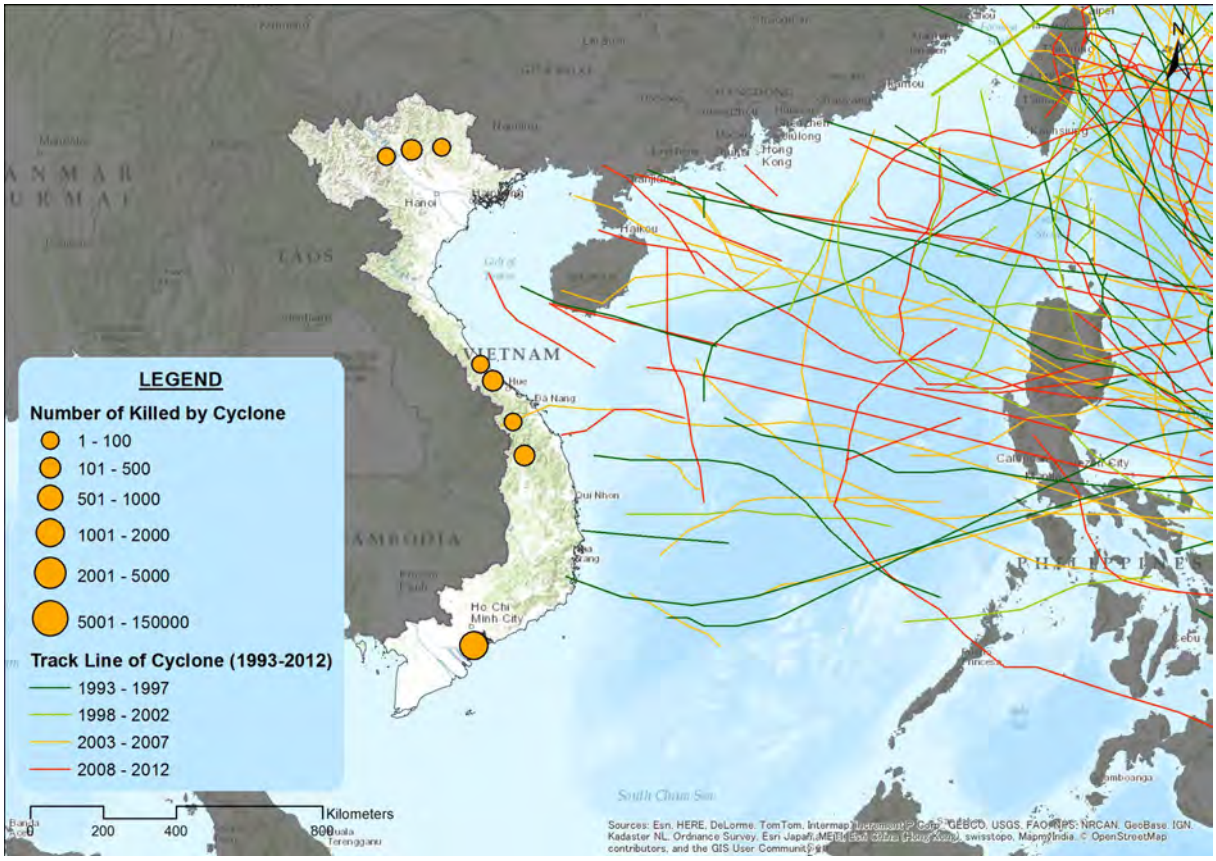
1) EM-DAT: The OFDA/CRED International Disaster Database – www.emdat.be – Université Catholique de Louvain – Brussels – Belgium.
2) Japan International Cooperation Agency (JICA) (2012): "Data Collection Survey on ASEAN Regional Collaboration in Disaster Management"
3) Lee Siebert, Tom Simkin, and Paul Kimberly (2011): "Volcanoes of the World - Third Edition", Smithsonian Institute/University of California Press
4) OCHA -ROAP (2011). Holocene Eruption and Selected Volcanoes in Asia-Pacific
5) United Nations Office for the Coordination of Humanitarian Affairs (OCHA), Regional Office for Asia Pacific (ROAP) (2011): "Holocene Eruption and Selected Volcanoes in Asia-Pacific", Downloaded from "http://reliefweb.int/sites/reliefweb.int/files/resources/map_619.pdf"

2.6 Cyclone and Meteorological Hazards

Risks

Vietnam is located on the eastern edge of the Indochina Peninsula. It borders the Gulf of Tonkin and the South China Sea on the east, the Gulf of Thailand on the southwest, and China, Lao PDR, and Cambodia. It has a tropical monsoon climate except in the northern mountainous areas. An average of six to seven typhoons and/or tropical cyclones hit the country every year. It is also affected by typhoons passing through its coastal waters. Flooding due to heavy rains and high waves as well as other damages brought by meteorological disasters have occurred following typhoons from the Philippines.

Figure 2.10 shows the number of deaths and typhoon tracks.



Data Sources:

EM-DAT, The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium: http://www.emdat.be.
Dartmouth Flood Observatory, University of Colorado: http://floodobservatory.colorado.edu/
Japan Meteorological Agency, RSMC Best Track Data.

Figure 2.10 Location of Cyclone Disasters in Vietnam : Human Losses

Background

The country has a north-to-south distance of 1,650 km with a coastline of 3,260 km. The east-west distance is 600 km (maximum) in the north and 50 km (minimum) in Quang Binh province, the central part of the country. Mountains and highlands cover three-fourths of the country.

The northeast monsoon during winter is from October to May with a peak during November and early January. Southwest monsoon wind during summer is strong in the west slopes of Sung Mountains, but is not prominent in the northern and central areas located behind the mountains. Rainfall is governed by the monsoon. The distinction between rainy season (from May to October) and dry season (from November to April) is very clear in the southern region. It has much rain due to the

influence of the monsoon in the northern region. Annual rainfall is about 2,000 mm almost everywhere in the country. However, annual rainfall is higher in the highlands in the northern and southern regions with a range of 3,000 to 4,000 mm.

The landing of typhoons usually begins in the northern and central part of the country in May. Typhoons seem most prevalent in the northern area from June to August, the whole country in September and October, and southern part of the country in November to December. The impact and extent of damage due to typhoons depends on the speed and course of the typhoon and circumference environment, etc.

In more than 50 years (1954-2006), there have been a total of 380 typhoons and tropical depressions in Vietnam, of which 31% hit the north area, 36% in the northern central and middle central regions, and 33% in the southern central and the southern regions. Typhoon landfalls are usually accompanied by high tides and heavy rains, thus resulting in heavy and long rains and floods. It is estimated that up to 80-90% of Vietnam's population is affected by typhoons.

Meteorological disaster conditions in Vietnam are summarized in Table 2.10.

Table 2.10 Situation of Meteorological Disasters in Vietnam

Region	Meteorological disasters
Northern and Central Mountains	• Flash floods (landslide) due to heavy rain. • Flooding was observed in a small steep basin upstream.
Red River Delta	• Flood season in the Red River and Thai Binh River system normally occurs from May to September. • Floods, high waves, and storm surges due to typhoons (tropical cyclones) and floods due to heavy rains caused by monsoons.
Central plains	• Flood season on the rivers from Thanh Hoa to Ha Tinh is from June to October every year. • Floods on these rivers generally occur on the main streams as a result of the dyke systems which prevent overflow.
Mekong Delta	• The flooding level in the Mekong River delta is generated from upstream floods and is also directly influenced by tides and the water reserving capacity of Tonle Sap. • The progress of floods in the Mekong river delta is slow, and floods last for a long period of 4 to 5 months annually, causing inundation in almost all areas of the Mekong river delta.

Climate change vulnerability and impact in Vietnam are as follows.

- Most regions in Vietnam may experience an increase in temperature of 2–4ºC by 2100. Vietnam's rainfall pattern may also be greatly affected by the Southwest Monsoon. As per ADB (2009), future rainfall in most of the areas of Vietnam may increase by 5–10% towards the end of this century.
- Typhoons, droughts, floods, and heat waves are among the most significant and extreme events in Vietnam. The peak month for typhoon landfalls in Vietnam has shifted from August to November over the last 50 years. The frequency of floods and droughts has also increased.
- In Vietnam, an upward trend in mean sea level has been observed with an average increase of 2–3 mm per year.

Responses by Vietnam

At the central level, the National Committee, an inter-ministerial institution serves as the coordinating body for disaster reduction efforts in Vietnam. Its secretariat is provided by the Department of Dyke Management and Flood Control (DDMFC) of the Ministry of Agriculture and Rural Development (MARD). The CCFSC (Central Committee for Flood and Storm Control) from the same Ministry formulates all regulations and mitigation measures related to typhoons and floods with emphasis on dyke protection, surveillance, and maintenance. Local emergency work is coordinated by the provincial CFSC. Typhoon warnings and forecasts are issued by the National Hydro-Meteorological Service (NHMS), but the transmission of detailed information, including support for disaster prevention, is carried out by the Committee of Flood and Storm Control (CFSC).

Meteorological service in Vietnam is under the responsibility of the NCHMF (National Centre for Hydro-meteorological Forecasting), an operational unit under the NHMS (National Hydro-meteorological Service) and the MONRE (Ministry of Natural Resources and Environment).

The NCHMF is responsible for weather, marine, severe weather, and hydrological forecasts. The terms of forecast include short range, middle range, monthly and seasonal forecasts. The NHMS issues the following products.

Table 2.11 Weather Information Supplied by the NHMS

Type of information	Content
Weather Forecast	Weather forecast, Marine weather, 10 day forecast, Monthly outlook, Seasonal outlook
Severe weather	Tropical cyclone (typhoon)
River system	Short-Range Forecast, Medium-term forecast, Monthly forecast, Seasonal forecast
Marine Hydrology	Wave map, Storm surge, Tide, Current map, rate, Warning
Extreme weather information on hydrological systems	Flood warning, Drought warning
Other products	Weather satellite images, radar images, numerical weather prediction

Sources of Hazard and Risk Information

Table 2.12 Sources of Hazard and Risk Information: Cyclone and Other Meteorological Hazards

NCHMF (National Centre for Hydro-Meteorological Forecasting)
http://www.nchmf.gov.vn/web/en-US/43/Default.aspx Tel: +84-4-38244919 E-mail : met_int@hn.vnn.vn

The hazard risk assessment results related to tropical cyclones (meteorological) disasters are as follows.

Table 2.13 Other Sources of Information: Cyclone and Other Meteorological Hazards

Institution	Literature name
Economy and Environment Program for Southeast Asia (2010)	Climate Change Vulnerability Mapping for Southeast Asia http://css.escwa.org.lb/sdpd/1338/d2-5a.pdf
UNISDR (2010)	Synthesis Report on Ten ASEAN Countries Disaster Risks Assessment http://www.unisdr.org/files/18872_asean.pdf
International Centre for Environmental Management (2008)	Rapid Assessment of the extent and Impact of Sea Level Rise in Viet Nam

Reports on Hazard and/or Risk Assessment

"Cyclone" is a term to describe many types of low pressure systems, of which tropical cyclones/typhoons are the main types creating disasters in the ASEAN region. Under the framework of WMO, leading countries implement monitoring/detection of

tropical cyclones on a regional basis. Table 2.14 indicates the responsible territory allocated to ASEAN members and its leading country.

Table 2.14 Members of WMO Tropical Cyclone Committee

	Warning Zones	Members（ASEAN）	Leading Country
Western North Pacific Ocean and South China Sea	0° - 60°(N) 0° - 100°(E)	Cambodia, Lao PDR, Malaysia, Philippines, Singapore, Thailand, Vietnam	Japan
Bay of Bengal and the Arabian Sea	5°S - 45°(N) 30°E - 90°(E)	Myanmar, Thailand	India
South Pacific and South-East Indian Ocean	0°-50°(S) 90° - 170°(E)	Indonesia	Fiji

The dates and information utilized in this report have been acquired from various reports on the studies and research conducted on tropical cyclones and meteorological hazards published on the internet. Collected documents include evaluation results of hazards/risks, as well as their evaluation methods. With regard to tropical cyclones/typhoons, a meteorological organization of each country compiles a summary on the damage situation, including the number of casualties or loss of human lives, and the estimated amount of damage, etc.

Locations of existing investigations and studies on cyclone and other meteorological hazards are shown in Figure 2.11. Outline of those investigations and studies are attached in Appendix 2 and their summary is given in Table 2.15.

Figure 2.11 Locations of Existing Investigations and Studies: Cyclone, Landslides and Other Meteorological Hazards

Table 2.15 Summary of Existing Investigations and Studies: Cyclone and Other Meteorological Hazards

Country/Region	Summary of Existing Studies and Reports
ASEAN	Study reports on natural disasters in the whole ASEAN region are available.
Vietnam	Vietnam comes second in terms of the occurrence of large storms after the Philippines. The National Strategy of Natural Disaster Prevention and the Action & Adoption Plan for Natural Disaster by 2020 were approved in November 2007. Development of financial solutions (including insurance) for disaster risks has been recommended.

References for Data and Further Reading

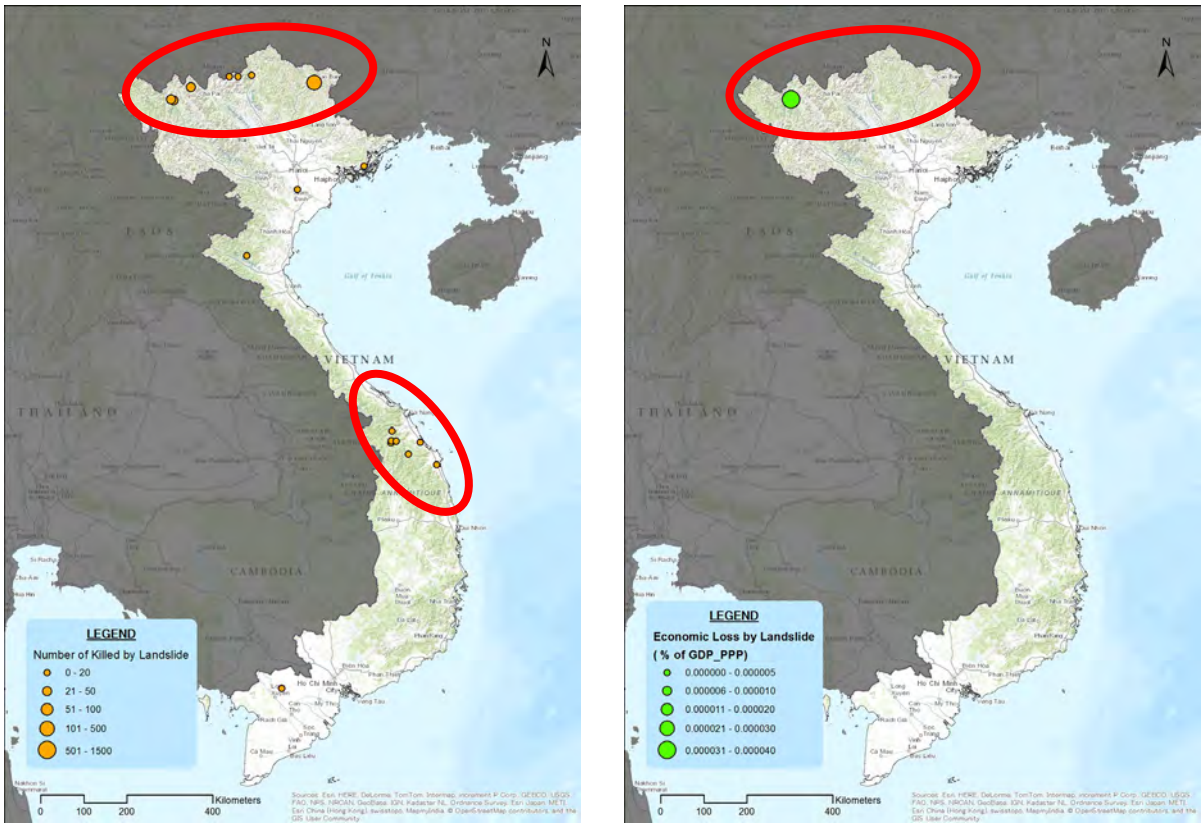
1) Edwin ST Lai (2013): "Overview of Member's Summary of Reports 2012, TC-45 Appendix VI - AWG Working Reports Members, WMO, p.30
2) ESCAP/WMO Typhoon Committee. (http://www.typhooncommittee.org/)
3) NCHMF (Website): http://www.nhmf.gov.v/web/en-US/43/Default.Aspx
4) Socialist Republic of Vietnam (2007): "National Strategy for Natural Disaster Prevention, Response and mitigation to 2020.
5) The World Bank (2010): “Weathering the Storm: Options for Disaster Risk Financing in Vietnam.”
6) WMO National Meteorological or Hydrometeorological Services of Members (http://www.wmo.int/pages/members/members_en.html)
7) WMO (2010). First Meeting of the Task Team on “Meteorological, Hydrological and Climate Services for Improved Humanitarian Planning and Response”, WMO Headquarters, Geneva, Switzerland (31 August - 2 September, 2010)

2.7 Landslides

Risks

The area affect by landslides spreads widely in the northern mountain area and is distributed narrowly in the middle of the country near the border with Lao PDR and the coastal region.

Figures 2.12 shows locations of landslides recorded during 1983 and 2012. Scale of disasters is expressed by human losses and economic losses.



(a) Human Losses (b) Economy Losses (% of GDP)

: Hot Spots

Data Sources:

EM-DAT, The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium: http://www.emdat.be.
Pacific Rim Coordination Center Disaster Data: http://data.pacificrimnetwork.org/.
Global Unique Disaster Identification Number: http://www.glidenumber.net/glide/public/search/search.jsp.

Figure 2.12 Locations of Landslide Disasters in Vietnam

Background

Landslides triggered by the heavy rain during a typhoon or tropical storm are distributed in the sedimentary rock area containing limestone in the precipitous northern region, and the granite area in Quang Ngai province in the central region.

As the trigger for landslides is the heavy rain during a typhoon or tropical storm, the risk of landslide rises as climate change causes growth in the number and strength of typhoons. The exposure related to climate change is distributed in the northern and central regions.

According to the EM-DAT database (http://www.emdat.be/), the landslide with the most fatalities on record (200 people) occurred in Cao Bang province in the northwest region, where annual precipitation reaches over 4000 mm.

Responses by Vietnam

A hazard map for landslides has not been created and related laws are under development. There have been pilot projects for an early warning system for landslides, however the system has not yet performed effectively. The practical activities for risk assessment and vulnerability in local areas are not sufficient.

Several projects for the early warning system, the study of landslide records, and risk management for the landslide are on-going. (e.g. Emergency Rehabilitation of Calamity Damage Project (ADB), Geo-Information Technology for Hazard Risk Assessment (ADB).

Reports on Hazard and/or Risk Assessment

Locations of existing investigations and studies on landslides are shown in Figure 2.11. Outlines of the investigations and studies are shown in Appendix 2 and their summary is given in Table 2.16.

Table 2.16 Summary of Existing Studies and Reports by Country: Landslide

Country/Region	Summary of Existing Studies and Reports
ASEAN	There have been a few reports that study landslides for ASEAN and the Pacific region at large in recent years. Disaster risks are assessed by scenario, exposure, vulnerability, damage, and loss. An assessment framework is also sought to give an overview of risks, hazard, and vulnerability.
Vietnam	High levels of hazard are distributed in the northern and central areas. The frequency of landslides, number of deaths and economic losses are ranked third in ASEAN. Exposure is widely distributed in the northern mountain area near the border with Laos and the coastal area in the central region. Although many mitigating activities in the damaged regions have been conducted by ADB and other donors, preparedness for hazards, such as mapping or risk assessment, has not yet been developed. A project for an early warning system was conducted in pilot regions, but is not currently functioning. Several projects for early warning systems, landslide hazard analysis, and management for landslide risk are on-going.

References for Data and Further Reading

1) Economy and Environment Program for Southeast Asia (EEPSEA) (2009): "Climate Change Vulnerability Mapping for Southeast Asia", p. 19

3. Industrial Parks

3.1 Distribution of Industrial Parks in Vietnam

347 industrial parks were identified by the study, and as shown in Figure 3.1, they are distributed along the coast line of Vietnam from the north to south. Concentrations can be seen around major cities, namely Hanoi, Haiphong, Da Nang, and Ho Chi Ming.

A list of the industrial parks in Vietnam is given in Appendix 3, and a brief description of the selected industrial parks is given in reference[2].

Development levels of parks in Vietnam vary significantly, with many catering to domestic firms and lacking capacity to communicate with foreign investors. Individual parks in Vietnam often have websites, either in their own right or in the form of pages on the website of the development company. While the industrial park's primary websites are often in Vietnamese, most have an English version, though these often contain less information. Detailed information on these websites is generally limited. Further information is available on central portals, especially the Vietnam Industrial Parks Information Portal (VIPIP). However, this information often contradicts information from park websites and other portals, suggesting frequent inaccuracies. Further, information on park/developer websites and central portals is often out of date. Central government information on parks lacks detail, and is sometimes inconsistent or out of date. As such, reliable, up to date information can only be obtained directly from park operators.

[2] AHA Centre and JICA (2014), Risk Assessment Reports for ASEAN and its Countries, Natural Disaster Risk Assessment and Area Business Continuity Plan Formulation for Industrial Areas in the ASEAN Region.

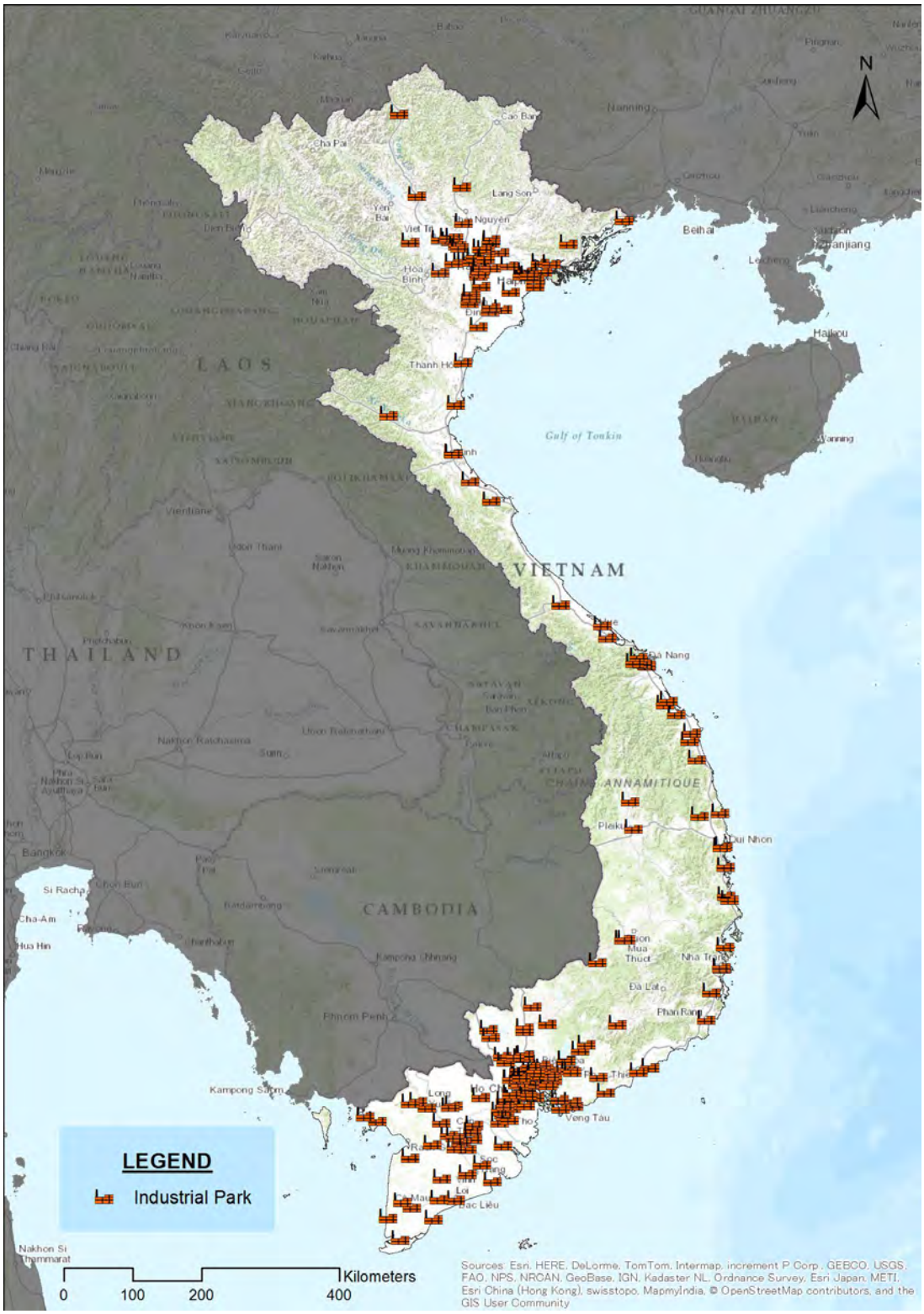


Figure 3.1 Distribution of Industrial Parks in Vietnam.

3.2 Historical Evolution of Industrial Parks

From the 1950s to the 1970s, Vietnam had a limited base for industry due to the economic system in place under French colonial rule and the impact of the Vietnam War. Though the US pursued industrial development in the south, particularly around Ho Chi Minh City, this was discontinued following reunification and the reintroduction of a centrally planned economy.

It was not until the late 1980s that significant development of industrial parks was pursued in Vietnam. 1986 saw the launch of 'doi moi' or 'renovation' measures, including, in 1987, the liberalization its FDI laws to permit foreign investment. Early foreign investors included Taiwan, Japan and Korea. Following the 1987 reforms, a rapid influx of foreign investment into industrial parks occurred. This often outpaced infrastructural investment, and unreliable power supplies, transport facilities, and telecommunications networks limited the ability of foreign investors to capitalize on opportunities. Legal constraints and bureaucratic obstacles also played a role. In addition, this influx was dependent on international market forces. For example, FDI fell from USD 8.3 billion in 1996 to USD 1.4 billion in 1999 following a downturn in the Asian markets. When this happened, industrial parks faced reduced demand, and the government was forced to take an increased role in subsidizing industrial park development.

Industrial parks have traditionally been located near to major urban centers such as Ho Chi Minh City and Hanoi. However, following the 1997 rural unrest in Thai Binh province the government has made an effort to encourage industrial parks in different areas of the country to spread economic growth. There are now 51 industrial parks in the Northern Economic Zone, and more than 300 across the whole country, housing more than 3,600 foreign investment projects. Foreign manufacturing investment is dominated by Asian firms. As of February 2012, 80% of projects and 85% of capital came from Chinese or Southeast Asian investors.

While privately-owned parks have increased, some of the structures of the centrally managed economy seen prior to 1987 have been maintained. The majority of industrial parks retain strong links with the Vietnamese government. These ties take a number of different forms. Parks are often developed by government ministries, such as the Department of Human Settlement and Housing Development, of the Ministry of Construction, or the Vietnam Chamber of Commerce and Industry, or joint stock

companies where the government owns a stake. In addition, local People's Committees (local government committees) often hold a stake in the management of the parks through state-owned enterprises.

Since 2000, the Vietnamese government has sought to increase 'hi-tech' capacity industrial parks within Vietnam. There is a high-tech park in Hanoi, Ho Chi Minh City and Da Nang. Traditionally, industrial parks in Vietnam have focused on light industry and manufacturing such as garment, footwear and electrical goods. While several companies such as Canon have implemented state of the art technology in their factories, hi-tech industrial parks have generally suffered from a lack of demand, such as in the case of Hao Lac Hi-tech Park.

3.3 Recent Trends and Japanese Investment

Japan was one of the early foreign investors in Vietnam following the relaxation of FDI laws in the late 1980s. Early major Japanese investors included Honda and Yamaha, both of which still have major assembly facilities in Vietnam. Other Japanese firms with a large presence include Canon, Daiwa and Denso. Some industrial parks, such as Long Duc, specifically target Japanese investors. Japanese firms have also been instrumental in developing industrial parks in Vietnam. In 1997, Sumitomo Corporation completed the development of its first industrial park, Thang Long Industrial Park, hear Hanoi. It completed a second park, Thang Long Industrial Park II, in 2009.

The Japanese government has also sought to promote Japanese investment in Vietnamese industrial parks. For example, the Japanese government has promoted infrastructure development by funding projects such as the East-West Economic Corridor, allowing for easier access from Da Nang to Myanmar, Thailand, Laos and Vietnam.

3.4 Risks of Natural Hazards

For the first glance of risks of natural hazards to industrial parks and individual enterprises, it is useful superimpose your location on the distribution maps of natural disasters given in Chapter 2. Figures 3.2 and 3.3 are examples showing relationships of locations of industrial parks, and flood and cyclone disasters, respectively. For the

detailed assessment of the risks of natural disasters to industrial parks and individual enterprises, hazard and risk assessment are required for an area of interest.

A description of general investment risks of Vietnam is attached in Appendix 4.

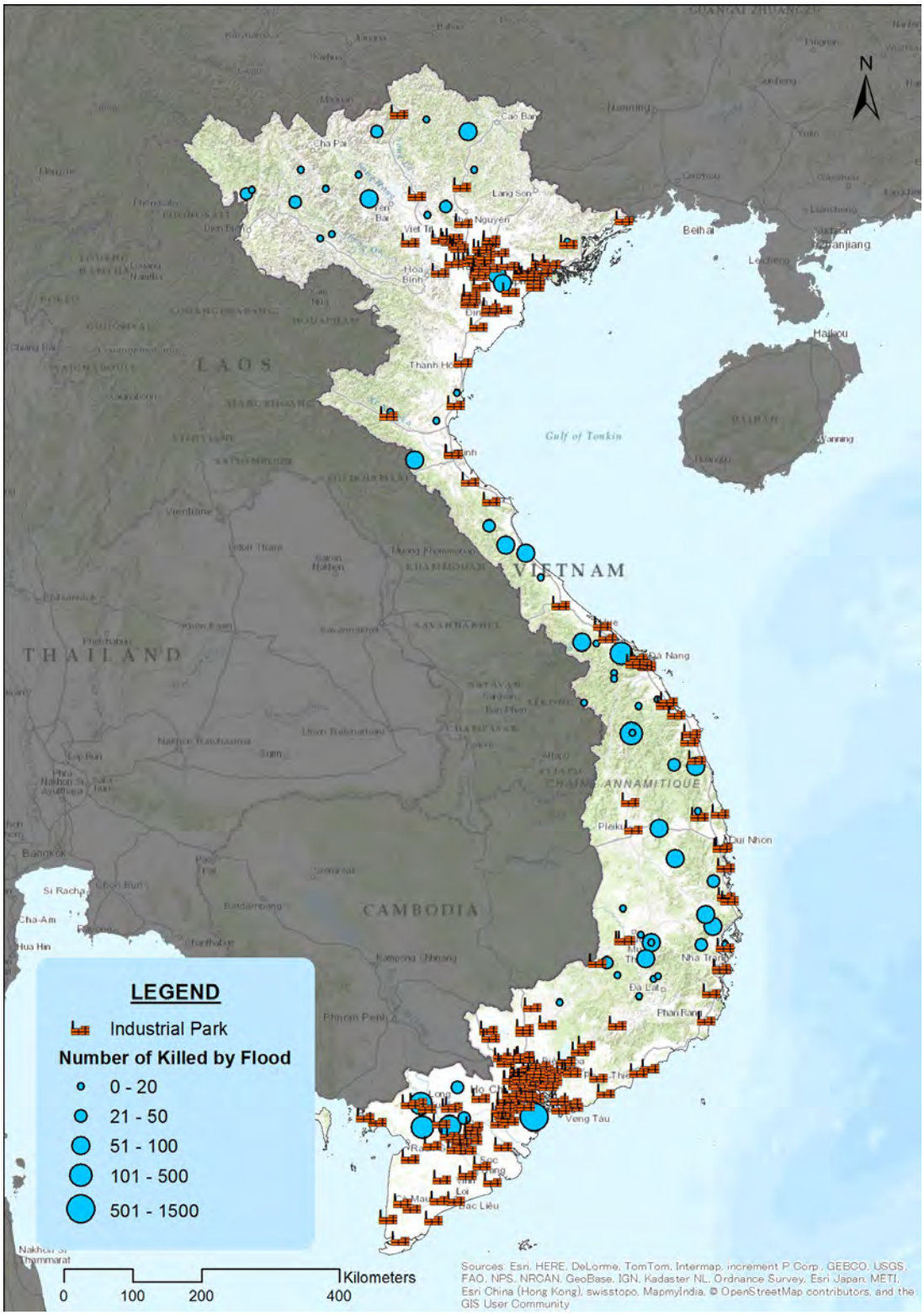


Figure 3.2 Industrial Parks and Flood Disasters: Vietnam

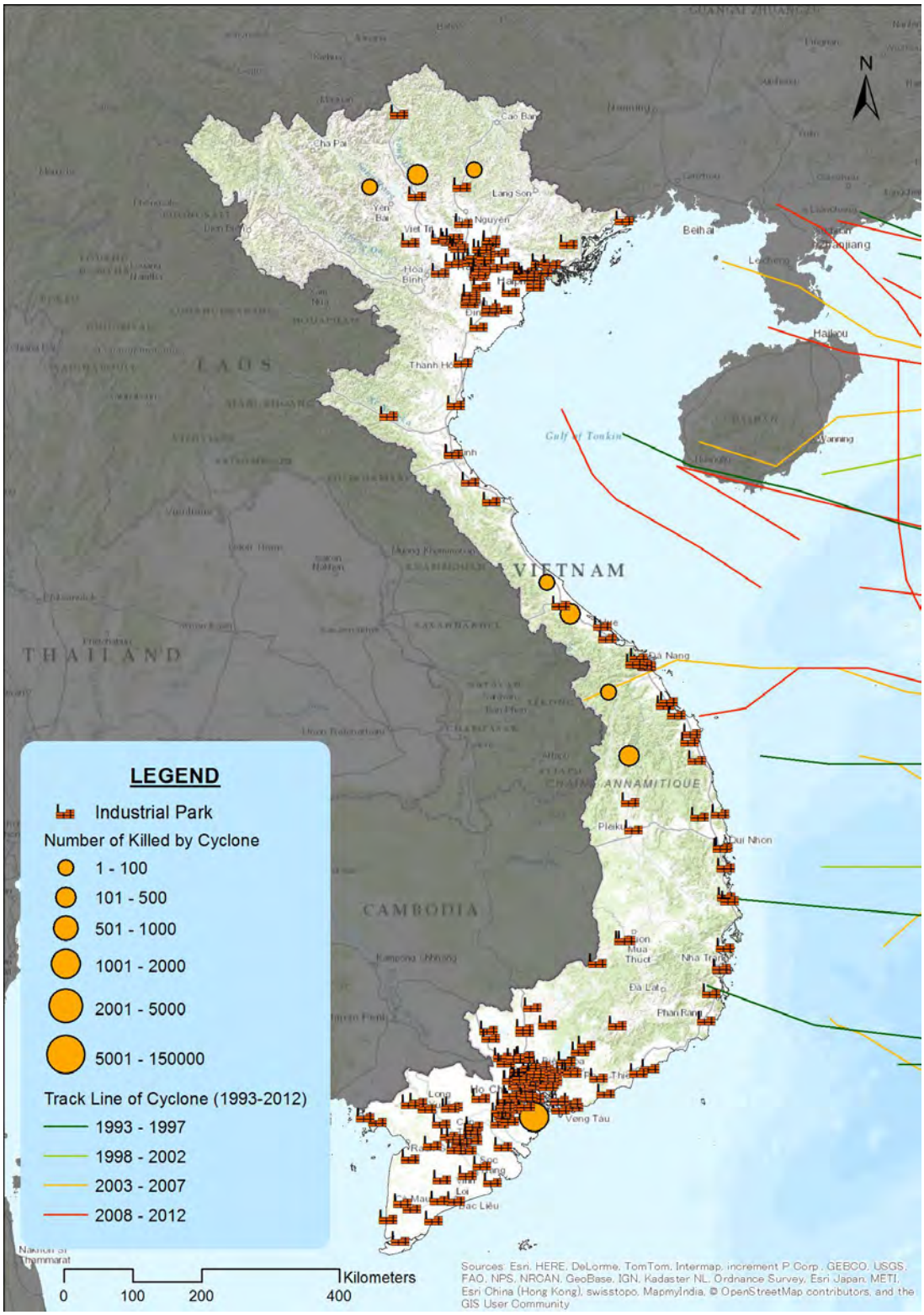


Figure 3.3 Industrial Parks and Cyclone Disasters: Vietnam

4. Transport Infrastructure and Lifeline Utilities

4.1 Overview of Transport Infrastructure

Road

In Vietnam, the main trunk roads are national road route No. 1 connecting Hanoi and Ho Chi Minh, national road route No.5 connecting Hanoi and Haiphong, and national road route No. 18 connecting Hanoi and Cai Rang Bay, etc. The total length of national roads, provincial roads, and district roads is 251,787 km, of which 39,972 km (16%) is asphalt concrete paved road. The status of road development is shown as follows.

Table 4.1 Road Development Status in 2006

Classification	Extension (km)	Type of Pavement- (km)				
		Asphalt	Concrete	Low-cost	Gravel, Earth	Others
National	17,295	7,750	344	6,447	2,854	-
Provincial	23,138	3,474	701	11,030	7,889	44
District	54,962	1,762	2,581	10,992	112,158	3,601
Village	141,442	1,616	18,442	9,226	112,158	-
Urban	8,536	2,465	776	2,750	2,544	-
Others	6,414	-	160.4	547	5,393	-
Total	251,787	16,967	23,005	40,992	166,834	3,644

Source: General Department of Highway Management and Maintenance/ Ministry of Transportation, Trade and Industry, Vietnam Highway Management and Maintenance Project Finding Study Report 2010

Vehicle ownership of Vietnam in 2007 was 539,000, which is 0.8 vehicle per 100 persons. This is the lowest level in Asia. Although the length of the developed expressway is about 70 km (2008), 20 new routes have been planned for development by 2020, increasing its length to 5,900 km, according to the Expressway Development Plan by MOT, which was submitted to the Prime Minister in November 2007.

The Ministry of Transportation (MOT) is formulating a traffic infrastructure development plan and standards, etc.

Major road networks of Vietnam are shown in Figure 4.1.

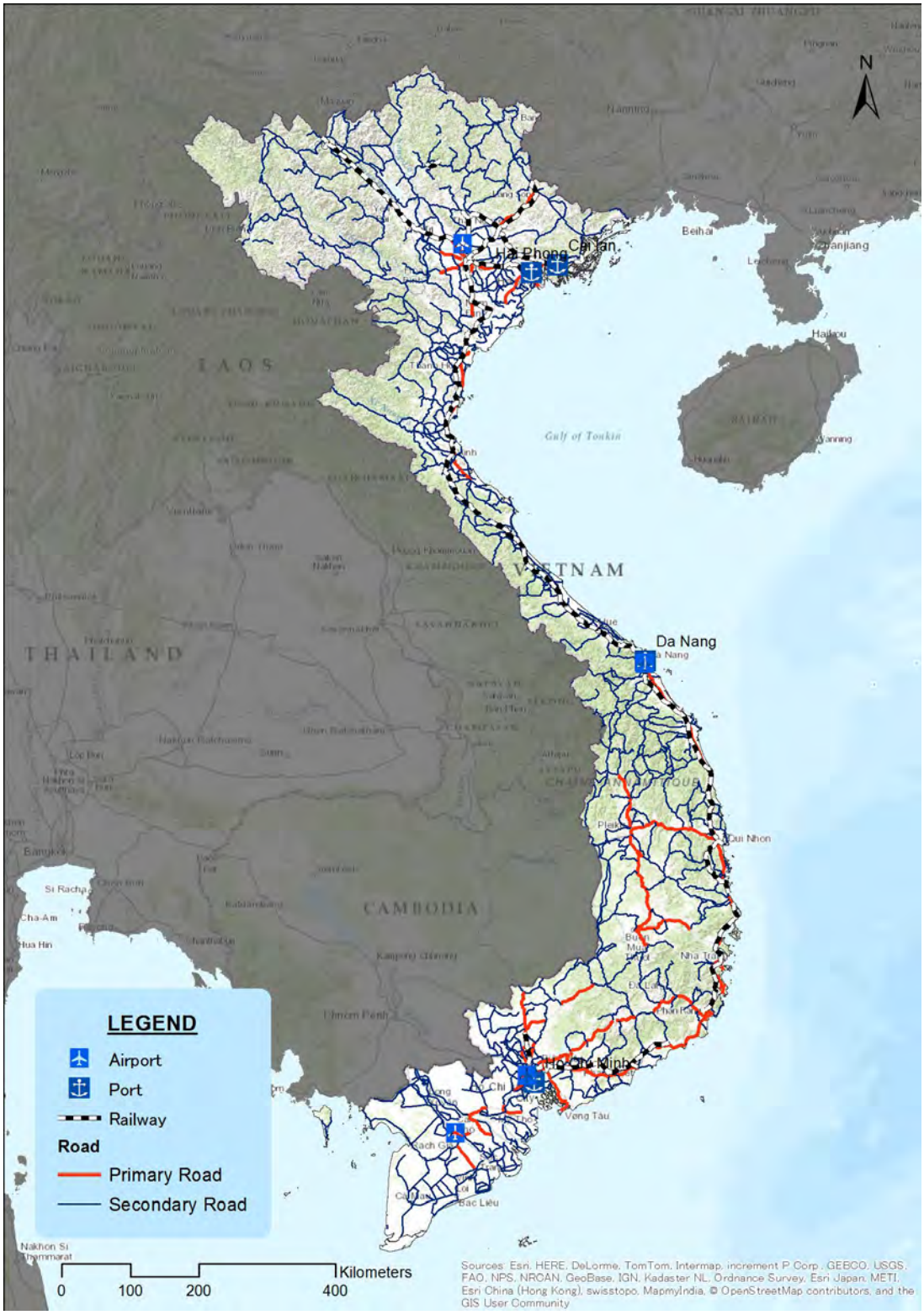


Figure 4.1 Major Airport, Port, Road and Railway Networks of Vietnam

Railway

The railway of Vietnam is runs from the northern to southern areas, with the total length of the railway at about 2,600 km.

Table 4.2 Outline of Main Routes of Vietnam Railway

Main Route	Extension (km)	Gauge (mm)
Hanoi~Ho Chi Minh	1,726	1,000
Hanoi~Hai Phong	102	1,000
Hanoi~Lao Cai	296	1,000
Hanoi~Dong Dang	162	1,435, 1,000
Hanoi~Quang Chau	75	1,435, 1,000
Kep~Uon Bi~Ha Long	106	1,435
Kep~Luu Xa	57	1,435

Source: Maeda Masayoshi, Transportation Condition of Vietnam (Okayama Prefecture, Vietnam Business Support Desk)

The railway is not yet electrified, and railroad tracks, roadbeds, signals, and communication facilities, etc. have become antiquated. Work to replace the aging 44 bridges has just been completed with assistance from Japan.

Major railway networks are shown in Figure 4.1.

Port

There are many ports along the long coast line from north to south. Table 4.3 lists the major ports in Vietnam and their cargo and container handing volumes. According to the Vietnam Seaports Association, 54% of the cargo of the 54 ports in 2009 was handled, with 9% in the central area and 37% in the northern area. It is said that the center of port transportation is divided into the north and the south. As for container cargo, 65% is handled in the southern area, 3% in the central area, and the remaining 33% in the northern area.

Saigon Port is a group of 24 ports located along the Saigon River. Although the Saigon Port handles ample cargo and containers, since they are all river ports, only ships below the 30,000-ton class are able to enter the ports.

Currently aiming to become an international gateway, the development of the Cai Mep /Thi Vai International Port along the Thi Vai River has been started.

Locations of the major ports are shown in Figure 4.1.

Table 4.3 Major Ports in Vietnam and Their Cargo and Container Handling in 2009

Port		Cargo Throughput		Container Throughput		Ship Calls
		thousand tons	share (%)	thousand tons	share (%)	
Northern Part		63,752	37	1,762,627	33	10,089
	Hai Phong	14,370	8	816,000	15	4,779
	Dinh Vu	3,254	2	359,000	7	402
	Cai Rang	4,736	3	185,235	3	464
Central Part		14,994	9	142,229	3	8,804
	Qui Nohon	3,856	2	54,649	1	1,510
	Da Nang	3,132	2	69,720	1	1,800
	Nha Trang	1,334	1	3,942	0	688
Southern Part		93,382	54	3,494,246	65	13,128
	Saigon New	33,000	19	2,460,000	46	2,319
	Saigon	14,008	8	378,226	7	1,721
	Ben Bghe	4,354	3	140,922	3	870
	Phu Mi	3,133	2	-	-	412
	Dong Nai	2,366	1	-	-	741
Total		172,128	100	5,399,102	100	32,021

Source: JBIC, Investment Environment in Vietnam 2012.8

Airport

In Vietnam there are 21 commercial airports, of which the three (3) international airports are: Noi Bai International Airport (Hanoi City of the northern part), Tansonnhat International Airport (Ho Chi Minh City of the southern part), and Da Nang International Airport (Da Nang City of the central part). At these airports, 99% of the air cargo and about 89% of the plane passengers are transported in Vietnam (as of 2007).

Table 4.4 International Airports in Vietnam

International Airport	Airport Type	Operator	Location	Runways
Noi Bai	Joint military/civilian use	ACV	Hanoi City	3,800m×45m 3,800m×45m
Da Nang	Public (Joint use with military)	ACV	Da Nang City	3,048m×45m 3,048m×45m
Tansonnhat	Commercial	ACV	Ho Chi Minh City	3,048m×45m 3,800m×45m

Source: Wikipedia, List of airports in Vietnam

Locations of the major airports of Vietnam are shown in Figure 4.1.

4.2 Overview of Lifeline Utilities

Electricity

The capacity of electric power generation equipment was 26,836 MW in 2012, and electric power generation was 120,210 GWh in 2012.

Table 4.5 Power Supply Composition Rate 2012

Item	Power Generation Equipment Capacity	Power Generation Achievement
	26,836 MW	**120,210 GWh**
Hydro	48.3 %	43.9 %
Gas	26.5 %	34.2 %
Coal	17.7 %	18.9 %
Import	3.7 %	2.2 %
Oil	1.9 %	0.1 %
Other	1.9 %	0.7 %

Source: JETRO, Vietnam Electricity Survey 2013

In Vietnam, electricity is supplied through the local power distribution companies under the EVN. There are five (5) power distribution companies: the northern part (NPC), the central part (CPC), the southern part (SPC), Hanoi City (HANOI), and Ho Chi Minh City (HCMC). There are also power distribution companies under each of the five power distribution company depending on the area (province and district).

At NPC or SPC, power distribution to various industries is about 60%, and at Hanoi power, power distribution to the civilian field is about 55%. For all of Vietnam, power distribution to the industrial field is over 50%.

Locations of the major power stations and dams are shown in Figure 4.2.

Water Supply

Although the institution responsible for the water supply is the Ministry of Construction, water supply services for village where the service population is less than 5,000 are under the jurisdiction of the Ministry of Agriculture and Rural Development.

There are 78 water supply operations in 61 provinces and direct control cities throughout the country. They are composed of the northern part (41), the central part (12), and the southern part (25). It is said that the rate of non-revenue water is 30%.

The categories of the water supply operations for the urban areas in Vietnam are as follows.

Table 4.6 Category of the Urban Area

City Category	Urban Form	Population (thousands)	City
Special City	Big City	1,500 or more	Hanoi, Ho Chi Minh
Category I	Province City	500-1,500	Hai Phong, Da Nang, Can Tho
Category II	Local City	250-500	Hue, Nha Trang, and other 10 cities
Category III	District City	100-250	16 cities
Category IV	LGU	50-100	58 LGUs
Category V	LGU	4-50	612 LGUs

Source: Ministry of Health, Labor and Welfare, International Water Promotion Report 2009

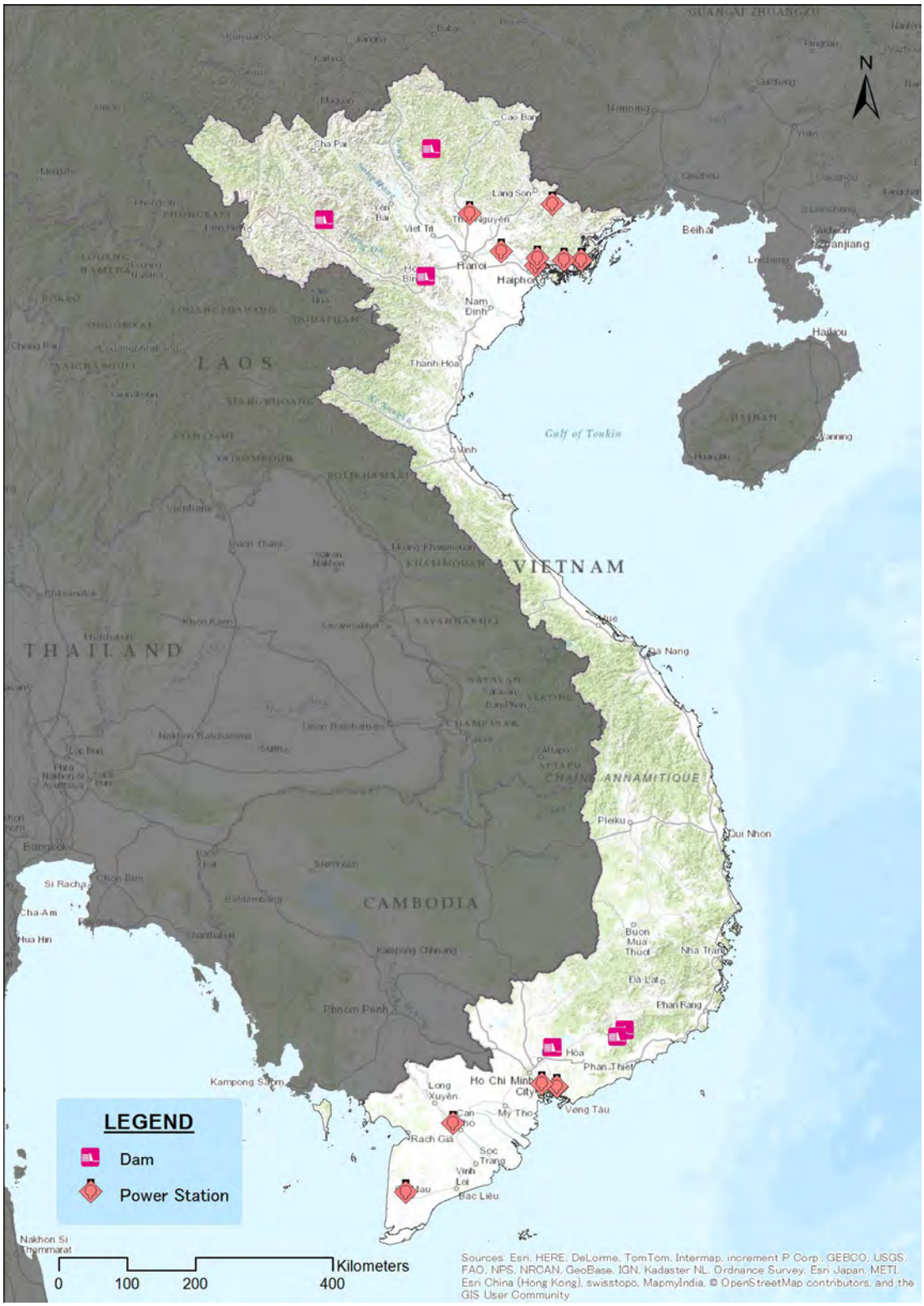


Figure 4.2 Major Power Stations and Dams of Vietnam

Sewerage

In Vietnam, industrialization due to economic advancement and the concentration of populations in urban area is ongoing. Industrial waste and domestic waste are discharged directly into the rivers because of a combined drainage system and insufficient sewerage system.

Although it is reported that about 1,100 km of sewer pipeline has already been installed, the sewerage service rate is low at 18%. The sewer system developed during the French colonial period is still used.

During rainstorms, urban areas are inundated because of faulty drainage capacities.

Communications

In Vietnam, six (6) companies are have entered the fixed communication market and provide Internet services including fixed-line telephone services and IP phone lines.

Table 4.7 Fixed Communication Enterprises of Vietnam

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

Source: Hanoi Telecom 2007

The companies providing mobile phone service are the following six (6) companies.

Table 4.8 Companies for Mobile Phones in Vietnam

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 1x

Source: Hanoi Telecom 2007

Internet and Broadband

As of June 2011, about 29 million people throughout the country use the Internet. Most people use one of the 6,600 tele-centers and internet cafes located throughout the country. There are 3.84 million subscribers to broadband with a diffusion rate of 4.3%.

Mobile Phone

There are 127.32 million subscribers to mobile phone service as of 2011, and this number is increasing yearly with a diffusion rate is 143.4%, which has far exceeded one unit per person.

Fixed-line Phone

The diffusion rate for fixed-line telephones has dropped rapidly since its peak in 2009. There are 10.18 million subscribers to fixed-line phones with a diffusion rate of 11.5%.

Broadcasting

Terrestrial broadcasting is performed by 61 local stations. These stations are operated and managed by VTV, which is headquartered in the capital, and also by the people's committees of ministries and centrally-controlled municipalities. VTV provides nationwide terrestrial broadcasts through four lines.

Waste

A regulation for hazardous waste management (Decision No.1555/1999-/QD TTg) was issued in 1999 to define hazardous materials. A directive for enhancing the management of solid waste in urban centers and industrial parks (Directive No.23/2005-/CT_TTG) was also issued in 2005 to define the roles of each organization and the target treatment levels.

However, although the treatment level of solid waste in the central areas of cities and industrial estates is improving, the collection of the solid waste is still about 70%, with a low level of collection capacity. Hazardous waste is partly disposed at landfill sites, but not using proper methods. Medical waste is dumped or incinerated without proper treatment.

4.3 Natural Disasters and Infrastructure

Since transport infrastructure and lifeline utilities have crucial for business continuity of enterprises, it is important to know their risks to natural disasters. For the first glance of the risks, it is useful superimpose locations of transport infrastructure and lifeline utilities on the distribution maps of natural disasters given in Chapter 2. Figures 4.3 to 4.5 are examples of superimposing. For the detailed assessment of the risks of natural disasters to transport infrastructure and lifeline utilities, hazard and risk assessment are required for an area of interest.

In Vietnam, floods occur in the rainy season (June to November) influenced by the tropical monsoons, and also during the typhoon season (September to October) in the northern and central part areas where typhoons land. Storm rainfalls in the upper basin of the Mekong cause flood disaster over wide areas in the Mekong delta.

If a large flood is caused by the Red River, it is assumed that the flood level will be 13.11 at Hanoi and will cause complete paralysis of the urban functions, in addition to inundating industrial estates and roads, etc. (Reference: Dr. Kuldeep Pareta, Flood Monitoring Simulation Model: A Case of Red river Delta, Vietnam)

Hai Phong and its surroundings have not suffered from floods, but inundation of 40 cm to 60 cm caused by storm waters. The industrial estates have not had a problem with floods because the base levels of industrial estates have been developed 1.5 m higher than the road. However the roads in the surrounding area will be inundated by storm waters. The Hai Hong area has also been affected by storm surges.

Flash floods have occurred at the foot of the hills of the west side in Vietnam. The industrial estates in Hai Phong will be affected by heavy rains and storm surges brought by typhoons. Moreover, they will also have a great impact on the trunk road running from the north to the south area of the country and local roads in the area around the industrial complex.

Tsunami does not have high risk in Vietnam. However, if an earthquake of M8.6 occurs in the Philippine Trench, waves of up to eight (8) to nine (9) m will roll onto the seashore in Vietnam, bringing serious damage to roads, buildings, industrial complexes, etc., according to researchers in Vietnam.

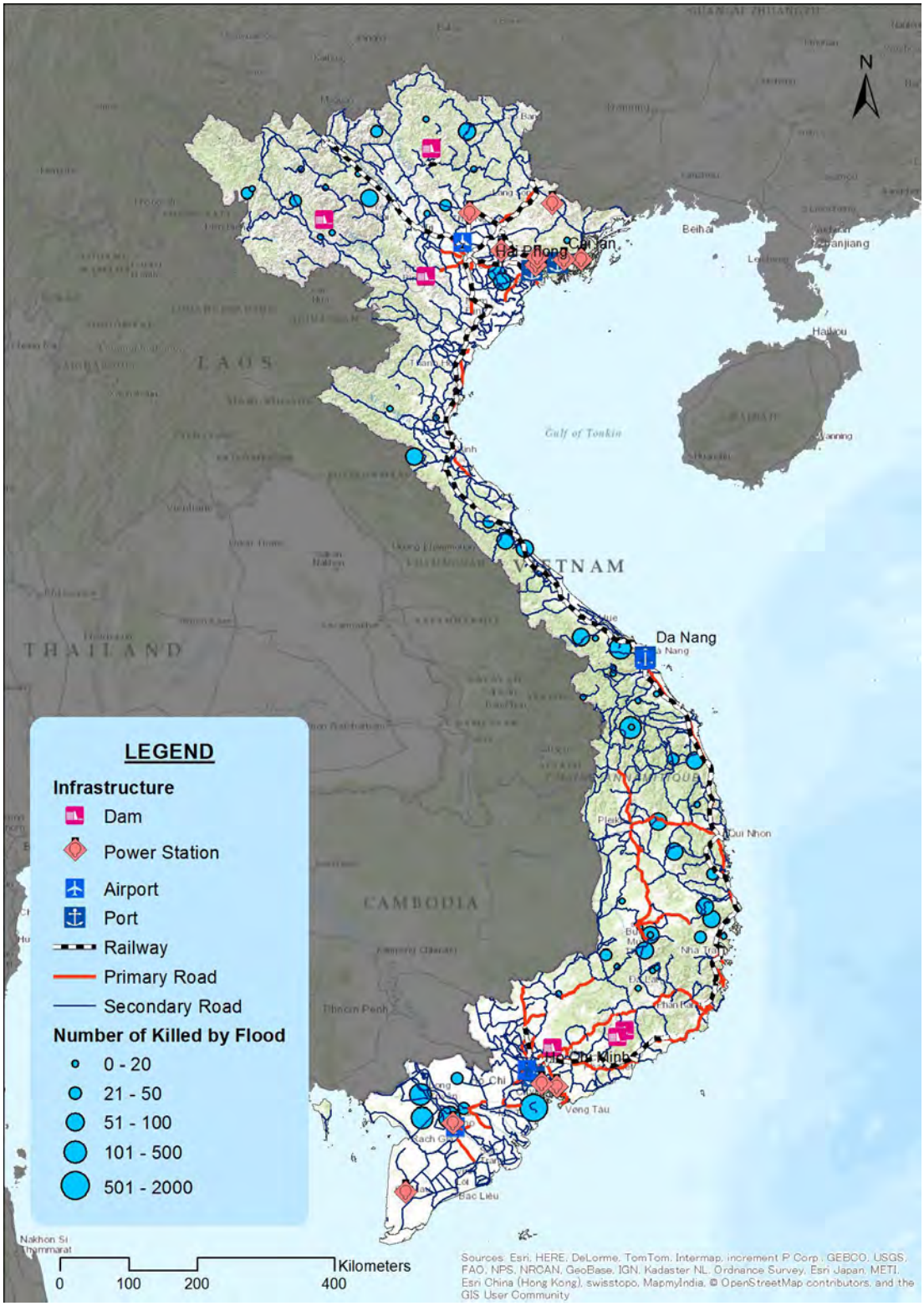


Figure 4.3 Flood Disasters and Major Infrastructure: Vietnam

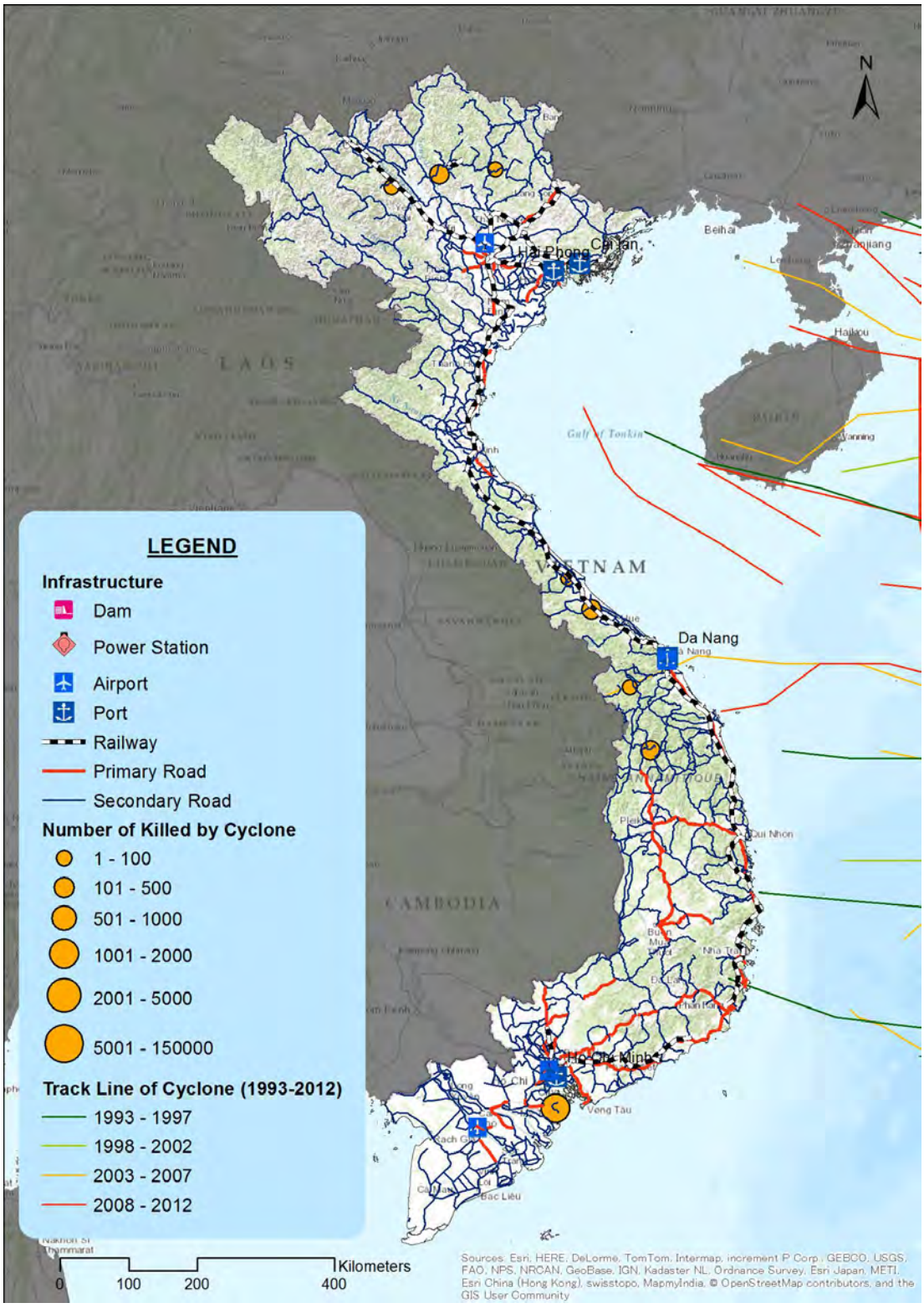


Figure 4.4 Cyclone Disasters and Major Infrastructure: Vietnam

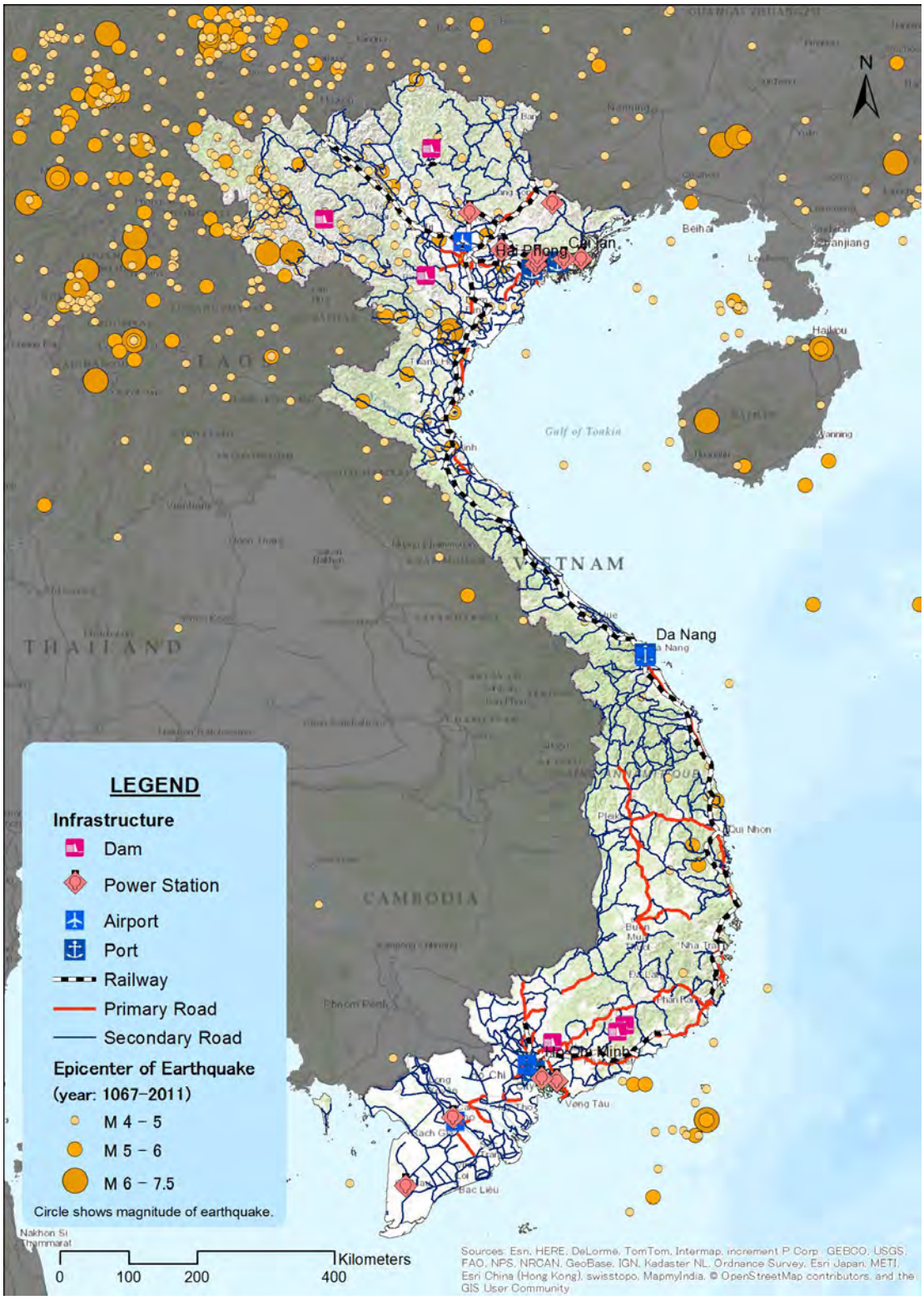


Figure 4.5 Epicenters of Past Earthquake and Major Infrastructure: Vietnam

5. Legislative Systems

5.1 Legislative Systems for Disaster Management

Disaster Management Laws

Table 5.1 Laws and Regulations of Disaster Management in Vietnam

	Laws / Regulations	Supervisory Authority	Subject
Law	Disaster Management Law (Draft)	Minister of Agriculture and Rural Development, Department of Dyke Management	Disaster Management
Decree	Decree No.168 - HDBT, 1990	under survey	Disaster Management
Decree	Statutes on Dike Management, and Flood and Typhoon Mitigation	Minister of Agriculture and Rural Development, Department of Dyke Management	Flood
Decree	Ordinance on Flood and Storm Control	under survey	Flood

The Disaster Management Law has been drafted with the support of the United Nations Development Programme, and is to be enacted in 2013.

Statutes on Dike Management, Flood and Typhoon Mitigation, and the Ordinance on Flood and Storm Control have been established for flood or storm disasters.

Disaster Management Strategies and Plans

Table 5.2 Strategies and Plan for Disaster Management in Vietnam

	Laws / Regulations	Supervisory Authority	Subject
Plan	National Strategy for Natural Disaster Prevention, Response and Mitigation to 2020 (2007 - 2020)	Minister of Agriculture and Rural Development, Department of Dyke Management	General Disasters
Plan	Implementation Plan of the National Strategy for Natural Disaster Prevention, Response and Mitigation to 2020, 2009	under survey	General Disasters
Plan	Plan of operations of Vietnam National Committee on International Decade for Natural Disaster Reduction (IDNDR)	under survey	General Disasters

The National Strategy for Natural Disaster Prevention, Response and Mitigation to 2020 emphasizes the policy shift from disaster prevention and mitigation based only on

structural measures to a policy including non-structural measures, from top-down to local government and community-based disaster management.

Provinces prepare their own implementation plans based on the Implementation Plan of the National Strategy for Natural Disaster Prevention, Response and Mitigation to 2020.

The National Strategy for Natural Disaster Prevention, Response and Mitigation to 2020 is an implementation plan issued in 2009 as guidelines for other ministries/agencies and local governments to apply according to local situations. Provinces prepare local implementation plans following this national framework.

5.2 Regulations and Standards for Business Continuity Management

No regulations, standards, or guidelines for business continuity management in time of disaster have been identified in Vietnam.

5.3 Legislative Systems for the Environment and Pollution Control

Environmental Laws and Regulations

Table 5.3 Laws and Regulations regarding the Environment in Vietnam

	Laws / Regulations	Supervisory Authority	Subject
Law	Law on Environmental Protection, revised in 2005	Ministry of Natural Resource and Environment	Environment Management
Law	Law on Water Resources, 1998	under survey	Water Resources

The Law on Environmental Protection, 2005 prescribes integrated environmental management regulations. The policy for the prevention of environmental incidents caused by disasters is also mentioned in the Environmental Law, Chap.9 and Chap.11.

Additionally, in the Law on Water Resources, the policy for the prevention of floods and other incidents caused by water is provided in Chapters 4 and 5.

Pollution Control Laws and Regulations

Table 5.4 Laws and Regulations for Environmental Pollution Control in Vietnam

	Laws / Regulations	Supervisory Authority	Subject
Regulation	QCVN 08 : 2008/BTNMT	Ministry of Natural Resource and Environment	Water Pollution
Regulation	QCVN 14 : 2008/BTNMT	Ministry of Natural Resource and Environment	Industrial Effluent
Regulation	QCVN 09 : 2008/BTNMT	Ministry of Natural Resource and Environment	Water Resources
Regulation	QCVN 24: 2009/BTNMT, National Technical Regulation on Industrial Wastewater	Ministry of Natural Resource and Environment	Industrial Effluent
Regulation	QCVN 03 : 2008/BNMT	under survey	Soil Pollution
Regulation	QCVN 19 : 2009/BTNMT, National Technical Regulation on Industrial Emission of Inorganic Substances and Dust	Ministry of Natural Resource and Environment	Air Pollution
Regulation	QCVN 20 : 2009/BTNMT, National Technical Regulation on Industrial Emission of Organic Substances	Ministry of Natural Resource and Environment	Air Pollution
Law	Law on Chemicals (No.06/2007/QH12)	Ministry of Industry and Trade, Vinachemia	Industrial Waste

The law and regulations for prevention of environmental pollution are listed above. These regulations define the management of water pollution, soil pollution, air pollution, industrial effluent, and industrial waste. QCVN refers to national technical standards in environmental or industrial sectors.

Most of these regulations have the no published documents translated into English, thus their details are not clear in this report.

5.4 Legislative Systems for Development including Land Use, Rivers, and Building Code in Vietnam

Table 5.5 Laws and Regulations for Land, Rivers, and Building Code in Vietnam

	Laws / Regulations	Supervisory Authority	Subject
Law	Law of Land, 2003	Ministry of Natural Resource and Environment	Land Use
Regulation	Statutes on Dike Management, and Flood and Typhoon Mitigation	under survey	River
Regulation	Ordinance on Water Resources Structures Protection	under survey	River

The policy on the prevention of flooding and other water disasters is defined in the Statutes on Dike Management, and Flood and Typhoon Mitigation and the Ordinance on Water Resources Structures Protection.

Due to the absence of published documents, little information about the regulations for development or land use could be obtained in our research. In addition, no information about building standards in Vietnam has been verified.

6. Implementation of BCP

6.1 Major Natural Disasters and Awareness Disaster Management

In Vietnam, the government and enterprises consider typhoons, floods, and storm surges as natural disaster risks. A committee handling climate change and sea level rise has been established within governmental ministries in charge of disaster management such as the Ministry of Agriculture and Rural Development (MARD) and the Ministry of Industry and Trade (MOIT). These committees deal with the improvement of regulations for disaster risk control.

Since disasters causing damage to business activities are rarely observed in the northern part of Vietnam near Hanoi and Haiphong, the business community is not very concerned about natural disaster risks for business conditions and the necessity of a disaster management system in business is not well understood. Local administrative agencies also do not recognize the value of BCM/BCP.

The Vietnam Chamber of Commerce and Industry (VCCI) can support SMEs in establishing their activities for business continuity during emergencies in conjunction with a contingency response system. They do not make a distinction between the concepts of BCM and Disaster Risk Management (DRM).

6.2 Current State of BCP Implementation

Implementation of BCP in Enterprises

In Vietnam, enterprises generally do not conduct efforts for disaster risk mitigation in business, and most business managers do not value corporate disaster management to a high degree. Individual enterprises are less concerned about disaster risk mitigation, since they have not had much experience with large-scale disasters in northern Vietnam, especially in the industrial parks of Hai-Phong or other states.

As example of implementation of DRM, large-scale enterprises and foreign capital companies conduct disaster risk assessments and/or establish disaster risk management systems. However, most SMEs cannot afford to consider a DRM under

present conditions. Enterprises which established DRM are mainly engaged in emergency response or contingency management, not disaster preparedness.

Implementation of BCP in Foreign Capital Companies and Japanese Companies

Although BCP is not yet well known by even among foreign capital companies in Vietnam, requirements for such from head offices or customers for BCP are gradually increasing. Moreover, Japanese enterprises have become increasingly concerned about BCP implementation, and the Japan Business Association in Vietnam (JBAV) is making an effort to increase awareness of BCP among its member companies.

Even foreign capital companies are generally not concerned about natural disaster risk. With the exception of certain large companies, most enterprises do not conduct BCM/BCP.

Implementation of BCP in Operators of Lifeline Utility Operators and Energy Suppliers

Enterprises handling hazardous materials such as oil, coal, or minerals, and enterprises in charge of utilities such as electricity companies have developed contingency plans and/or crisis management plans. These enterprises and companies are obligated by law to establish a crisis management system. Though corporate response during emergency situations caused by flood or storms, and policy for the quick recovery of business activities are defined in these contingency or management plans, case of specific BCP development have not yet identified.

6.3 Efforts on Promoting BCP Implementation

Regulations and Guidelines for BCP Implementation

In the present legislative system, Decree No. 168-HDBT outlines the role of the Central Committee of Storm and Flood Control (CCSFC), committees, and sectors at each local level. In this decree, disaster damage assessments and rehabilitation action are defined as corporate obligations for the private sector. No laws for defining

corporate efforts in the development of BCP or disaster risk management plans have been found.

The new Law of Disaster Risk Management will become effective in 2014. The new law requires all enterprises and agencies to develop disaster risk management plans. However the law does not regulate development of contingency plans or BCP.

Disaster management policy in Vietnam focuses on mitigating human suffering, not reducing business loss. Concerns regarding implementation of BCP have increased due to the consideration of disaster damage impacts on the economy and foreign investment. A symposium for ASEAN countries to discuss BCP has been held.

Efforts on Disseminating and Increasing Awareness of BCP by the Private Sector

Efforts for disseminating DRM to SMEs are conducted by private sectors such as VCCI. Though the establishment of emergency response and disaster preparedness should be of a higher priority than BCP, symposiums for corporate DRM have been held. In general, enterprises are becoming more concerned with business continuity at in times of disaster.

VCCI is strongly motivated in the efforts to disseminate corporate disaster management to SMEs, and they are currently considering the creation of certification standards for disaster management as a part of CSR.

6.4 Problems Facing for Implementation of BCP

In Vietnam, most enterprises and state administrations think DRM in business is less important, and have put weight on business growth instead of BCP implementation. DRM should be conducted first as a part of corporate risk management.

Due to a lack of resources using DRM or disaster risk assessment, improvement of social infrastructure such as electricity, water, and the traffic network has not been archived. Private enterprises assume that they cannot afford to develop their own disaster management systems or BCM.

The lack of knowledge and technical know-how regarding risk assessment and developing BCP, etc. is also regarded as a problem.

Appendix 1:
Method for Evaluating Predominant Hazards

The "Damage Amount / GDP" and "Number of Deaths" are used as the indices to show the impacts of the disasters considered and 6 natural hazards will be studied and compared. At the beginning of the study, only the "Damage Amount / GDP" was used as an index because the results can be used for Area BCP planning. However, the scarcity of information related to damage amounts became clear as the study progressed. As the information on the "Number of Deaths" is substantial compared to the damage amount, the "Number of Deaths" has been added as an index of impact.

The process of the study is as follows;

1) Based on the Damage Amount / GDP or Number of Death, each disaster is classified according to the ranking system outlined in Table A1,
2) The number of disaster events for each country is added by type of hazard and disaster rank, and then classified into Table A2,
3) The above information is then plotted on the impacts - frequency matrix by country,
4) As for earthquakes, tsunamis and volcanic hazards, if an event occurred before 1983 that was of the same (or higher) disaster rank as the maximum disaster rank recorded between 1983 to 2012, a point is plotted on the matrix which corresponds to the relevant disaster and frequency rank (=1).

Table A2 Disaster Rank and Damage

Disaster Rank	Damage Amount / GDP[3]	Number of Death
5	1.0% -	10,001 -
4	0.1% - 1.0%	1,001 - 10,000
3	0.01% - 0.1%	101 - 1,000
2	0.001% - 0.01%	11 - 100
1	- 0.001%	- 10

[3] Gross domestic product based on purchasing-power-parity (PPP) valuation of country GDP, International Monetary Fund, World Economic Outlook Database, October 2012

Table A3 Frequency Rank and Number of Events

Frequency Rank	Number of Events from 1983 to 2012	Average Frequency (Events / Year)
5	7 or more	1/5 -
4	4 to 6	1/10 - 1/5
3	2 to 3	1/15 - 1/10
2	1	1/30
1	Large Events occurred before 1983	-

Appendix 2:
Data Sheets
Outline of Existing Investigations and Studies

No.:	FL-001	Published Year:	2010
Study/ Report Name:	Synthesis Report on Ten ASEAN Countries Disaster Risks Assessment		
Access to Information:	www.unisdr.org/files/18872_asean.pdf		
Research Organization:	UNISDR/World Bank		
Study Area (Country):	ASEAN (10 countries)		
Studied Hazard:	Flood		
Studied Damage/ Risk:	Flood		
Main Data Sources:	CRED EM-DAT, ADRC, NGDC, GSHAP, MRC, WAMIS, DWR, Munich Re, World Bank, UNISDR, GAR, In Terragate, IFNet, CCFSC, DESINVENTAR		

Summary of the Study:

1) Overview

Disaster risks are assessed for years (1970-2009) by 1) Scenario, Exposure, Vulnerability, Damage and Loss analysis using existing database. The dominant disaster risks are cyclonic storms (typhoons), earthquakes, tsunamis, floods, epidemics, landslides, droughts volcanic eruptions and forest-fires. In total 1,211 reported disasters caused over 414,900 deaths.

2) Vulnerability

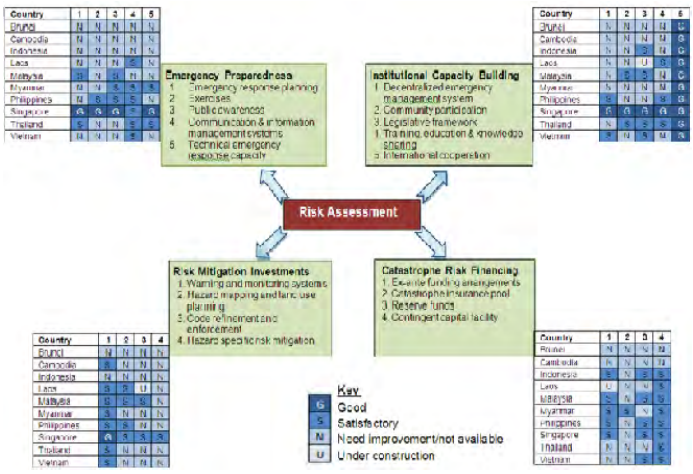
Method: the number of disaster events, deaths, affected population and economic losses are plotted against hazard types for 5 year intervals.

To estimate social vulnerability=> the average number of people killed.

ASEAN 17.7 death/year/million, Cambodia 3.56, Indonesia 20.38, Lao PDR 4.22, Malaysia 1.26, Myanmar 72.35, Philippines 11.93, Thailand4.63, Vietnam 4.60. Brunei and Singapore have no data.

3) Risk assessment framework

A status of risk assessment framework is assessed by country to view the current capacity of risk assessment. The evaluation table is show below.



No.:	FL-002	Published Year:	2012
Study/ Report Name:	Key Indicators for Asia and the Pacific 2012 43rd edition		
Access to Information:	www.adb.org/publications/key-indicators-asia-and-pacific-2012		
Research Organization:	ADB		
Study Area (Country):	ASEAN (10 countries)		
Studied Hazard:	Flood		
Studied Damage/ Risk:	Vulnerability by % population and area		
Main Data Sources:			

Summary of the Study:

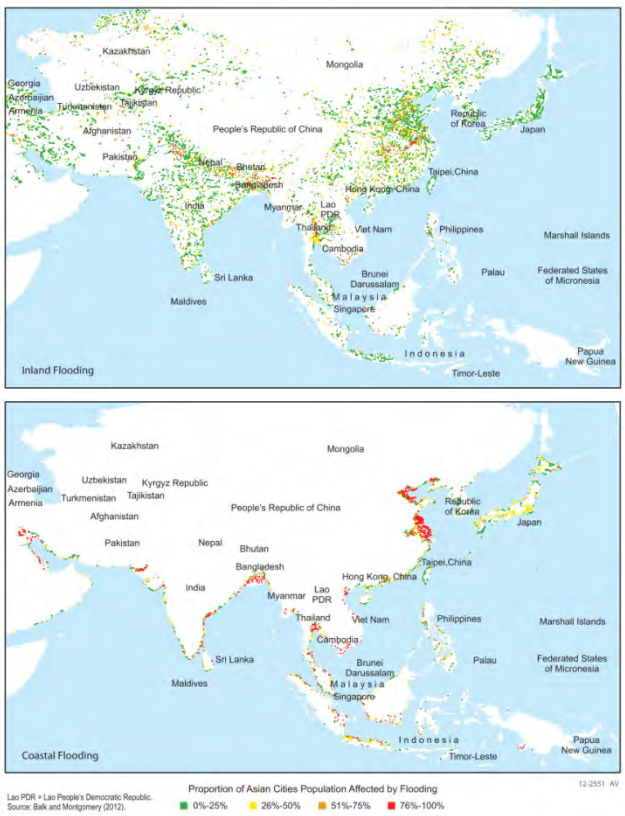
This report summarizes vulnerability of urban cities to flood in Asian and Pacific counties including the ASEAN region. The floods are classified as coastal flood and inland flood that may affect urban cities. Vulnerabilities are estimated by population and areas % at risk of flooding. Top 40 cities in Asian countries with 1 million populations or more that are vulnerable to flooding are listed.

Key findings:

The Southeast Asia (ASEAN) region's vulnerability to coastal flooding: 36.1% with Vietnam (73.9%), Thailand (60%).

In terms of inland flooding, the vulnerability for Southeast Asia is 14.7%. The estimated vulnerability: Vietnam (38.6%), the Lao PDR (34%), Thailand (29%).

Figure 19 **Vulnerability to Inland (top) and Coastal (bottom) Flooding**



No.:	FL-003	Published Year:	2010
Study/ Report Name:	Progress Report on Flood Hazard Mapping in Asian Countries ICHARM Publication No.16, ISSN 0386-5878/ Technical Note of PWRI No. 4164		
Access to Information:	http://www.icharm.pwri.go.jp/publication/pdf/2010/4164_progress_report_on_fhm.pdf		
Research Organization:	UNESCO (ICHARM)/PERI		
Study Area (Country):	ASEAN (10 countries)		
Studied Hazard:	Flood		
Studied Damage/ Risk:	Hazard Map		
Main Data Sources:			

Summary of the Study:

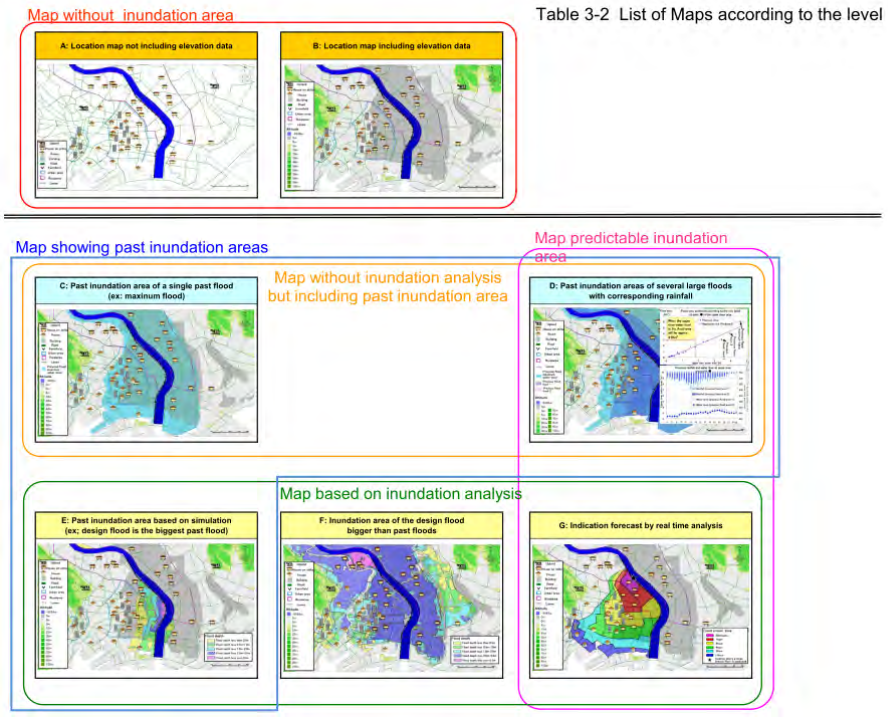
1) Overview

This is a seminar report on Flood Hazard Mapping production process for Asian Countries. Target countries were (China, Cambodia, Indonesia, Laos, Vietnam, Thailand, the Philippines, Malaysia).

2) Accuracy of Hazard Map

Two types of mapping methods are: i) interview based mapping (community-based), ii) quantitative hydrological data simulation models.

For the local usage, a simpler version is also effective. Examples of practical hazard maps are demonstrated as follows.



No.:	FL-004	Published Year:	2005
Study/ Report Name:	A Primer: Integrated Flood Risk Management in Asia 2		
Access to Information:	www.adpc.net/maininforesource/udrm/floodprimer.pdf		
Research Organization:	Asian Disaster Preparedness Center (ADPC)/UNICEF		
Study Area (Country):	Asia including ASEAN countries		
Studied Hazard:	Flood		
Studied Damage/ Risk:	Assessment method		
Main Data Sources:			

Summary of the Study:

This is a comprehensive and practical how-to-handbook for policy makers and implementation stakeholders of flood risk management in Asia, with updated resources to (1) authorize programs; (2) formulate decisions; (3) plan, develop and implement decisions; (4) support implementation of decisions. There are extensive glossaries of words and concepts in relation to flood risk management.

Topics include:

Chapter 2: Types and levels of flood: riverine flood, slow-onset, rapid-onset, normal flood (1 year flood), catastrophic flood (100 year flood). Causes of flood: meteological, hydrological and anthropogenic.

Chapter 3: Policies, legal and institutional arrangement plans:

Chapter 4: Flood risk assessment, data required for an assessment of potential damages and losses, Flood frequency calculations

Chapter 5: Importance of watershed and floodplain management for flood risk management

Chapter 6: Structural interventions: flood storage reservoir, dykes, levee and embankment, EIA, cost benefit analysis

Chapter 7: Flood-proofing measures, relocation, elevation, dry-flood proofing, wet-flood proofing, flood-proofing measures categories: permanent, contingent and emergency measures

Chapter 8: Flood preparedness planning: preparedness framework, activities, flood forecasting, public awareness

Chapter 9: Effective emergency response in environment healthe management, evacuation camps, delivery of goods

Case studies of ASEAN countries include:

Disaster Management and Relief in Malaysia,

Hazard Assessment in the Philippines,

Flood mitigation mix measures/community level management in Thailand,

Mekong River Commission Mediation of Transboundary Flood Issues

No.:	FL-005	Published Year:	2009
Study/ Report Name:	Climate Change Vulnerability Mapping for Southeast Asia		
Access to Information:	http://web.idrc.ca/uploads/user-S/12324196651Mapping_Report.pdf		
Research Organization:	Economy and Environment Program for Southeast Asia (EEPSEA)		
Study Area (Country):	ASEAN (Thailand, Vietnam, Laos, Cambodia, Indonesia, Malaysia, and Philippines)		
Studied Hazard:	Flood		
Studied Damage/ Risk:	Vulnerability to climate change, flood frequency		
Main Data Sources:	Urban Extent Database (GRUMP version 1) of the (CIESIN) GEODATA portal (the Environmental Database; http://geodata.grid.unep.ch/extras/datasetlist.php) BAKOSURTANAL		

Summary of the Study:

1) Overview

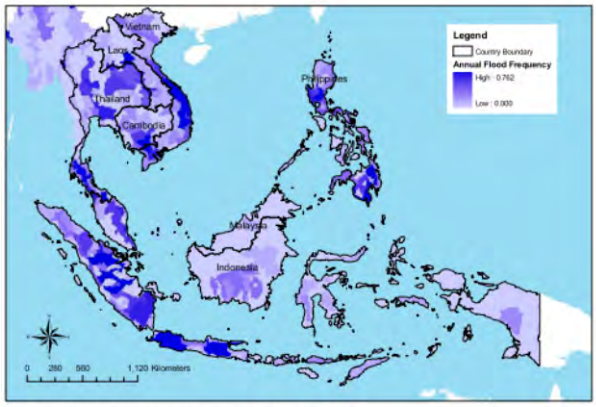
This study assesses vulnerability of Southeast Asian countries (Thailand, Vietnam, Laos, Cambodia, Indonesia, Malaysia, and Philippines) of climate change including flooding. Vulnerability is defined as a function of exposure (potential loss due to a hazard), sensitivity (the potential gravity of losses and damage), and adaptive capacity (how much to adapt a hazard situation).

2) Vulnerability assessment

Vulnerability is assessed by adaptive capacity (HDI, PPP, Gini-coefficient, Education, road, electricity…), population density (human sensitivity) and hazard map (hazard occurrence frequency data from 1980-2000). Adaptive capacity influences vulnerability. When adaptive capacity is low, vulnerability is high.

3) Area analysis

Cambodia is among the most vulnerable in ASEAN despite its relatively low exposure to climate hazards. The eastern coast of Vietnam is susceptible to cyclones, but adaptive capacity is high to manage to moderate its vulnerability. Bangkok and Jakarta have high adaptive capacities but not enough to moderate their extreme vulnerability with high population densities and significant exposure to climate hazards. A map shows annual flood frequency of the region.



Appendix 2B. Flood frequency (event per year from 1980-2001)

No.:	FL-006	Published Year:	2012
Study/ Report Name:	Reducing Vulnerability and Exposure to Disasters The Asia-Pacific Disaster Report 2012		
Access to Information:	http://www.unisdr.org/we/inform/publications/29288		
Research Organization:	ESCAP/UNISDR		
Study Area (Country):	ASEAN (10 countries)		
Studied Hazard:	Hydro-meteolological Hazard		
Studied Damage/ Risk:	Economic losses, fatalities, houses, risk-sensitive plans of investment		
Main Data Sources:			

Summary of the Study:

1) Overview

The Asia-Pacific region represents 75% of all global disaster fatalities. The economic and population growth contribute to a greater exposure to natural disasters. The population was doubled from 2.2 to 4.2 billion between 1970 and 2010. But the number of people who are exposed to flooding has increased from 29.5 to 63.8 million. The urban settlements are more vulnerable as the urban population increased from 17 to 44% of the total population between 1950 and 2010.

2) Vulnerability

Generally, smaller and less diversified economies are more vulnerable to disaster risks. Flood mortality risks are higher in rural areas with a densely concentrated and rapidly growing population with weak governance.

3) Risk

Risks are associated with economic and mortality risks. The exposure to flooding events constantly increases as of 1980 but mortality risks are decreasing as countries strengthened their risk governance capacities. However economic risks are increasing, due to slow adaptation of the existing fixed assets, such as old buildings and infrastructure, and institutional instruments such as land use planning and building regulation to cope with flooding particularly in rapidly urbanizing areas.

4) Spatial and land use plan

The national spatial and land use plans and policies are a key to reduce flood risks. Brunei, Indonesia, Lao PDR, Malaysia, Philippines, Singapore and Vietnam have land-use policies, plans or measures for DRR.

No.:	FL-008	Published Year:	2011
Study/ Report Name:	Advancing Disaster Risk Financing and Insurance in ASEAN Countries: Framework and Options for Implementation, Volume2: Appendix 1		
Access to Information:	https://www.gfdrr.org/sites/gfdrr.org/files/documents/DRFI_ASEAN_ Appendices_June12.pdf		
Research Organization:	GFDRR/World Bank		
Study Area (Country):	ASEAN (10 countries)		
Studied Hazard:	Flood (multiple disasters)		
Studied Damage/ Risk:	Damage, affected population, vulnerability index		
Main Data Sources:	World Bank, EM-DAT, Relief Web, GFDRR, CIA fact book		

Summary of the Study:

1) Overview

Disaster risks were compiled for ASEAN countries with data between 1982 and 2011. The following items are analyzed: disaster profile (% of different disasters), damage ($), affected population, vulnerability index (estimated number of people killed/year).

2) Disaster profile: Typhoon is the dominant incidence causing flood and landslide in most countries except Singapore and Brunei

Cambodia: 45% flood (Mekong river), 9% storm, 16% drought, 29% epidemic

Indonesia: west and dry zones most severely hit (Jakarta, Medan, Bandung)

Lao PDR: 50% flood, 22% epidemics, 13% storm, 13% drought

Malaysia: dominantly flood

Myanmar: multiple hazards, earthquake serious risk

Philippines: dominantly typhoons causing other hazards in conjunction

Thailand: multiple hazard (flood, drought, storms and landslide)

Vietnam: 49% storm, 37% floods, 5% epidemic, 3% landslide, 2% drought

3) Vulnerable areas

Mekong River Delta in Vietnam, all regions of the Philippines, most regions in Cambodia, North ad East Lao PDR, Bangkok in Thailand, the west and south of Sumatra and western and eastern Java in Indonesia.

4) Vulnerability

Urban (especially coastal) areas are more vulnerable against disasters due to a rapid population growth, urbanization, deforestation, and unplanned land use.

No.:	FL-013	Published Year:	2009
Study/ Report Name:	Flood Risk Management in the Border Zone between Cambodia and Vietnam		
Access to Information:	http://ns1.mrcmekong.org/download/fmmp-reports/V6E_FRMBZ_KH_VN_2.pdf		
Research Organization:	The Mekong River Commission Secretariat		
Study Area (Country):	Vietnam Cambodia		
Studied Hazard:	Flood		
Studied Damage/ Risk:	Damages, risk assessment		
Main Data Sources:	MRC ISIS model, local authorities		

Summary of the Study:

1) Overview

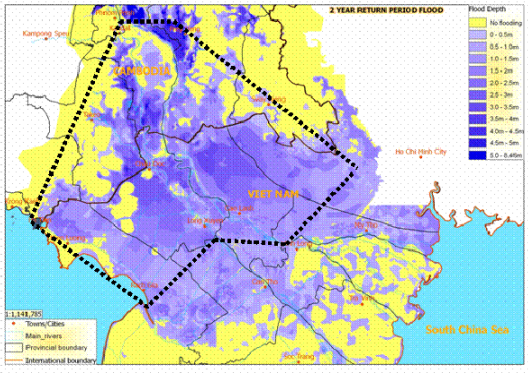
In this project, existing flood risk management plans are considered along the Mekong River in the following areas by conducting carefully thought assessments to estimate risks of damages of housing, agriculture and infrastructure. The project area covers 25 districts in Cambodia (10 districts in Takeo province, 7 districts in Kandal province, 5 districts in Prey Veng province, and 3 districts in Svay Rieng province) and 34 districts in Vietnam (11 districts in An Giang province, 11 districts in Dong Thap province, 5 districts in kien Giang province, 6 districts in Long An province, and 1 district in Tien Giang province).

1. In Vietnam:

a. Long Xuyen Quadrangle (LXQ) b. Area between Bassac and Mekong north of the Vam Nao c. Plain of Reeds (POR) north of the Nguyen Van Tiep Canal

2. In Cambodia:

a. Floodplains on the West Bassac (WB) b. Floodplains between Bassac and Mekong c. Floodplains on the left bank of the Mekong and south of the NR #1, also refered to as East Mekong.



The conclusion of the damage risk assessment suggests that if one country takes measures to mitigate flood risks, the risk in the other country increases. Therefore, mitigation measures have to be taken in both countries to lower the risks of flooding. A joint project or an international watercourse management to reduce risks of the flood is sought for.

No.:	FL-015	Published Year:	2011
Study/ Report Name:	Program for Hydro-Meteorological Disaster Mitigation in Secondary Cities in Asia (PROMISE) 2005 to 2010		
Access to Information:	http://www.adpc.net/v2007/programs/udrm/Downloads/PROMISE/MNE/PROMISE_FinalReport.pdf		
Research Organization:	Asian Disaster Preparedness Center (ADPC)		
Study Area (Country):	Indonesia/ Vietnam		
Studied Hazard:	Flood		
Studied Damage/ Risk:	Area		
Main Data Sources:			

Summary of the Study:

1) Overview

Mitigation of flood risks, activities conducted 2005-2010

2) Jakarta urban risk context

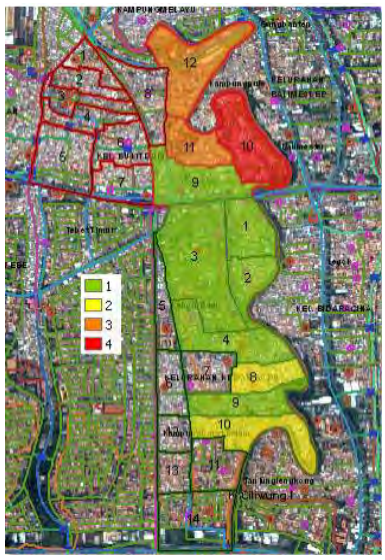
Jakarta is highly prone to flooding for 27 water systems are comprised of 13 rivers, drains and canals that collect surface run-off exits into Jakarta Bay through Jakarta's 35-km coast.

3) Cause of flooding: excessive rainfall, flash floods along these systems

4) Size of hazard: swells of about 2 to 4 meters, land subsidence, high tide, the conversion of swamps into residential areas in South and East Jakarta

5) The areas with flood risk: red most risky areas

A hazard map was produced using DUFLOW software with hydrology data of 2007 flood event and topography map and calibrated and verified with field data. Vulnerability was assessed and mapped using socio-demographic data. Capacity was mapped based on the assessed draining capacity of pumps and levees.



6) Community program for flood preparedness

Hazard mapping, risk identification, flood risk assessment, flood mitigation, flood disaster management planning, town watching, community-based action plan.

No.:	FL-021	Published Year:	2010
Study/ Report Name:	Flood Hazard and Risk Assessment of Hoang Long River Basin, Vietnam		
Access to Information:	http://www.mikebydhi.com/upload/mikebydhi2010/ publications/P033/P033_Presentation.pdf		
Research Organization:	Water Resources University, Nakhon Pathom Rajabhat University (MIKE by DHI conference)		
Study Area (Country):	Vietnam		
Studied Hazard:	Flood		
Studied Damage/ Risk:	Flood map, flood risk map		
Main Data Sources:			

Summary of the Study:

This paper analyzes and estimates floods for various return periods in Nihn Binh province. Rainfall frequency analysis is conduced to obtain a maximum 7-day rainfall and to construct design hyetographs for 5, 10, 20, 50, 100 and 200 year return periods and develop flood hazard maps and flood risk maps. MIKE11 by DHI is used for analysis.

The paper produced the following outcomes;

- Simulation of the magnitudes of flood flow along the rivers and floodplains for different return periods,
- Inundation maps in flooding areas,
- Estimation of tangible impact on resident, agriculture and infrastructure for various return period floods,
- Flood maps and flood risk maps.

Assessment of flood inundation areas, damage and risk assessment due to influx of floodwater are useful for construction of structural and non-structural measures such as flood control system, building improvement and flood warning.

This is a concise and clear technical analysis of flood hazard and risk assessment of Hoang Long river basin in Vietnam. A duplication of such studies at other river basin is useful for drawing flood management measures.

No.:	FL-022	Published Year:	2010
Study/ Report Name:	Flood Vulnerability Assessment of Downstream Area in Thach Han River Basin, Quang Tri Province		
Access to Information:	http://hmo.hus.vnu.edu.vn/file.php?file_id=459		
Research Organization:	Hanoi University of Science, Cietnam National University		
Study Area (Country):	Vietnam, Thach Han River Basin, Quang Tri Province		
Studied Hazard:	Flood		
Studied Damage/ Risk:	Area, population		
Main Data Sources:			

Summary of the Study:

1) Overview

This report combines a conventional flood analysis that focuses on physical characteristics of flood (flood depth, flood extent) with a newer approach to integrate vulnerability assessment of community and economic sectors towards flood (capacity of local communities, land use map.).

2) Area

Thach Han river basin in Quang Tri Province.

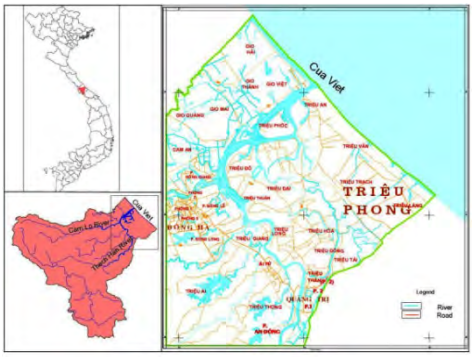


Fig 1: Location of study area

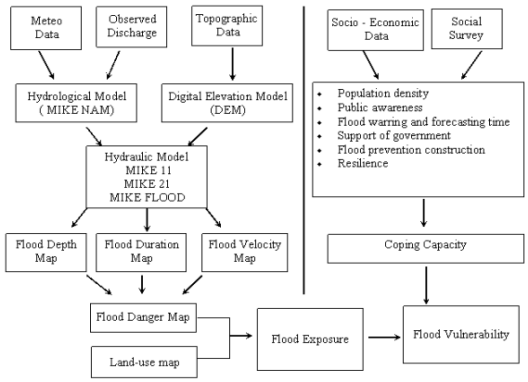


Fig 2: Conceptual framework for flood vulnerability assessment

3) Hazard map

Various flood maps and flood vulnerability matrix are produced: flood depth, duration, velocity and danger.

4) Vulnerability

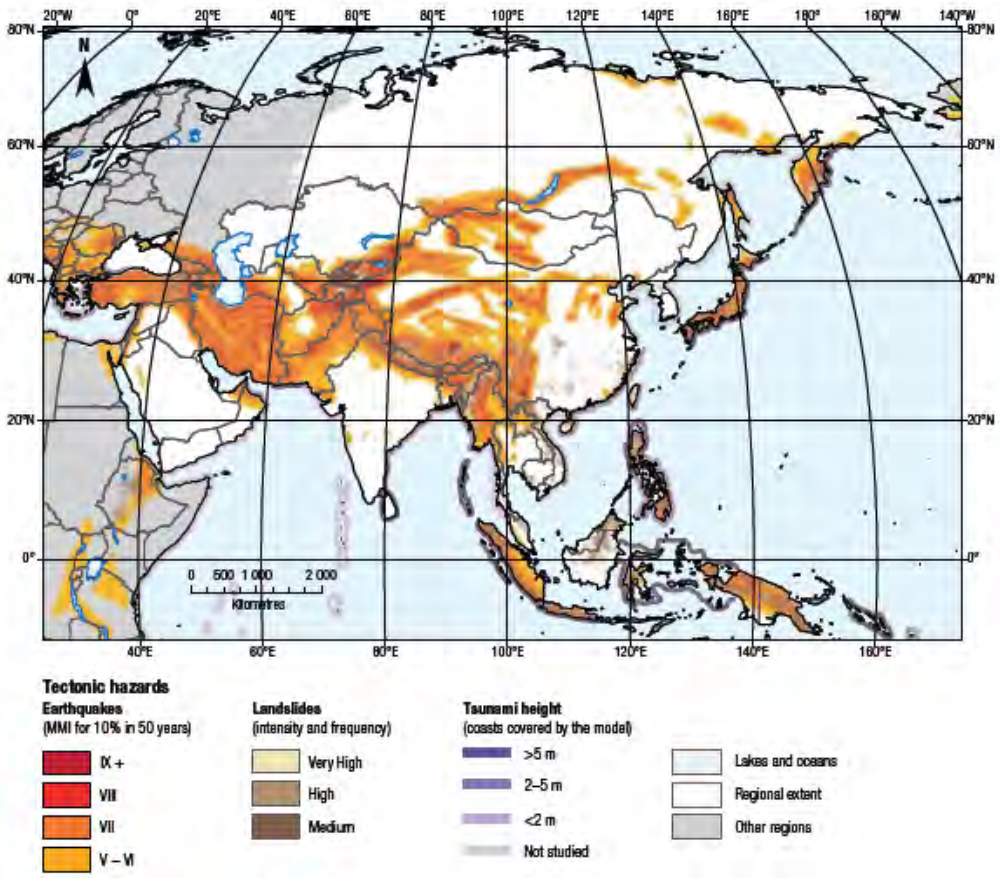
Vulnerability = Exposure –Coping Capacity

Maps show level of coping factors (land-use, exposure coping capacity (institutional preparedness), vulnerability (perception).

No.:	EQ_001	Published Year:	2009
Study/ Report Name:	Global assessment report on disaster risk reduction (2009) Risk and poverty in a changing climate		
Access to Information:	http://www.unisdr.org/we/inform/publications/9413		
Research Organization:	United Nations International Strategy for Disaster Reduction Secretariat (UNISDR)		
Study Area (Country):	Worldwide		
Studied Hazard:	Tropical cyclones, Floods, Landslides, **Earthquakes** (10% in 50 years MMI), Drought, Tsunamis, Forest and other biomass fires		
Studied Damage/ Risk:	Multi-hazard risk		
Main Data Sources:			

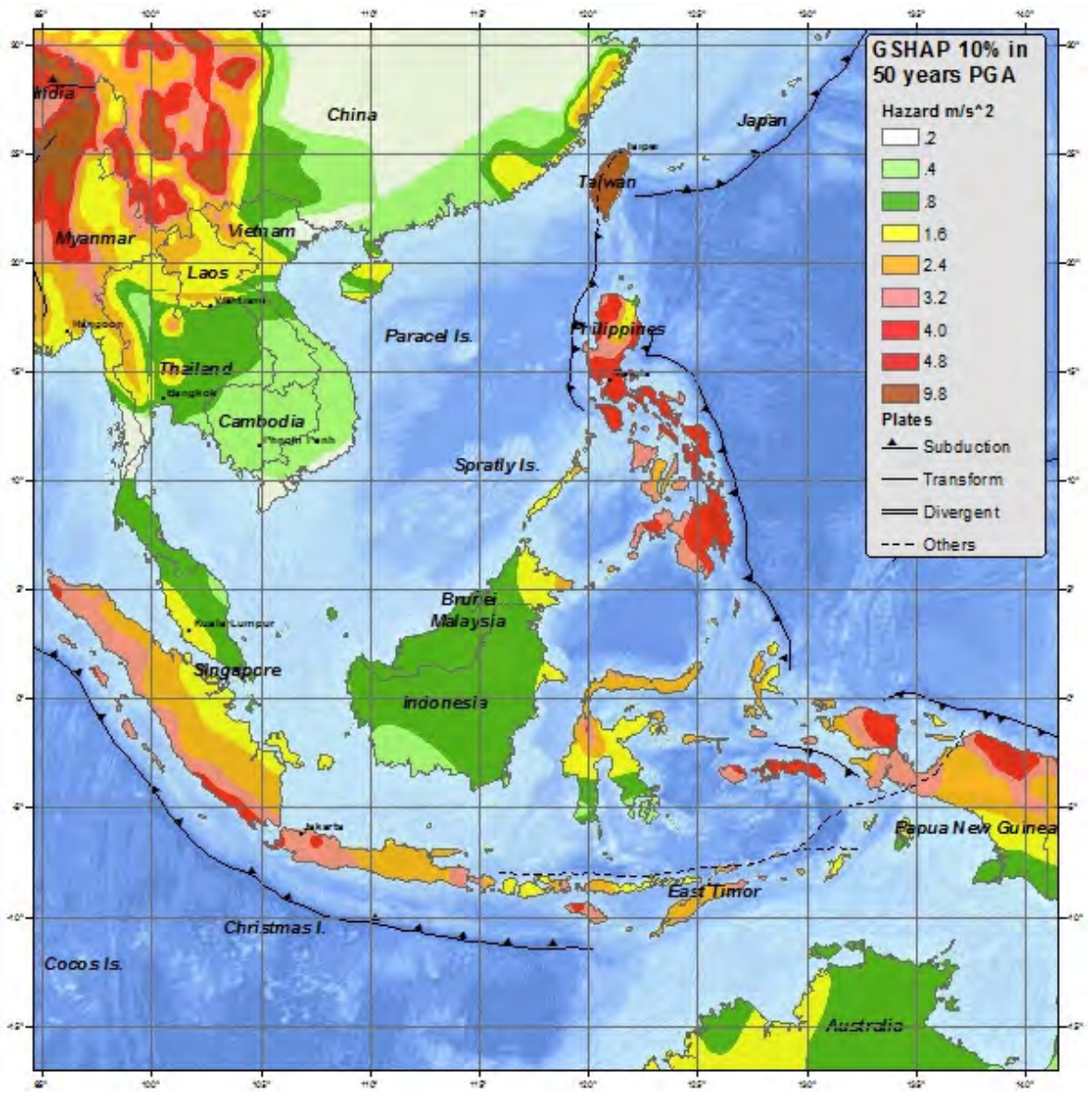
Summary of the Study:

An observation of disaster risk patterns and trends at the global level allows a visualization of the major concentrations of risk described in the report and an identification of the geographic distribution of disaster risk across countries, trends over time and the major drivers of these patterns and trends.



No.:	EQ_002	Published Year:	unknown
Study/ Report Name:	Seismic Hazard Map		
Access to Information:	http://earthquake.usgs.gov/earthquakes/world/indonesia/gshap.php		
Research Organization:	GSHAP, USGS		
Study Area (Country):	ASEAN		
Studied Hazard:	Earthquake / 10% in 50 years		
Studied Damage/ Risk:			
Main Data Sources:			

Summary of the Study:



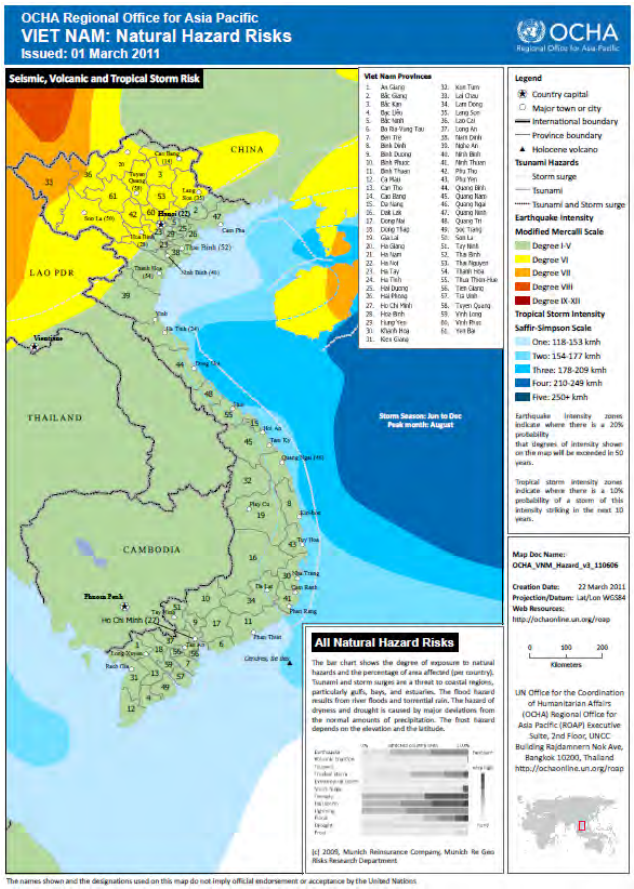
No.:	EQ_025	Published Year:	2011
Study/ Report Name:	VIET NAM: Natural Hazard Risks		
Access to Information:	http://reliefweb.int/sites/reliefweb.int/files/resources/map_1322.pdf		
Research Organization:	United Nations Office for the Coordination of Humanitarian Affairs Regional Office for Asia and the Pacific (OCHA-ROAP)		
Study Area (Country):	Vietnam		
Studied Hazard:	**Seismic**, Volcanic and Tropical Storm		
Studied Damage/ Risk:	All Natural Hazard Risks		
Main Data Sources:	UN Cartographic Section, Global Discovery, FAO, Smithsonian Institute, Pacific Disaster Center, UNISYS, Munich Reinsurance Group.		

Summary of the Study:

Earthquake intensity zones indicate where there is a 20% probability that degrees of intensity shown on the map will be exceeded in 50 years.

Tropical storm intensity zones indicate where there is a 10% probability of a storm of this intensity striking in the next 10 years.

The bar chart shows the degree of exposure to natural hazards and the percentage of area affected.



No.:	TN_002	Published Year:	2005
Study/ Report Name:	From Disaster to Reconstruction: A Report on ADB's Response to the Asian Tsunami		
Access to Information:	http://www.adb.org/publications/disaster-reconstruction-report-adbs-response-asian-tsunami		
Research Organization:	Asian Development Bank		
Study Area (Country):	ASEAN		
Studied Hazard:	Tsunami		
Studied Damage/ Risk:			
Main Data Sources:			

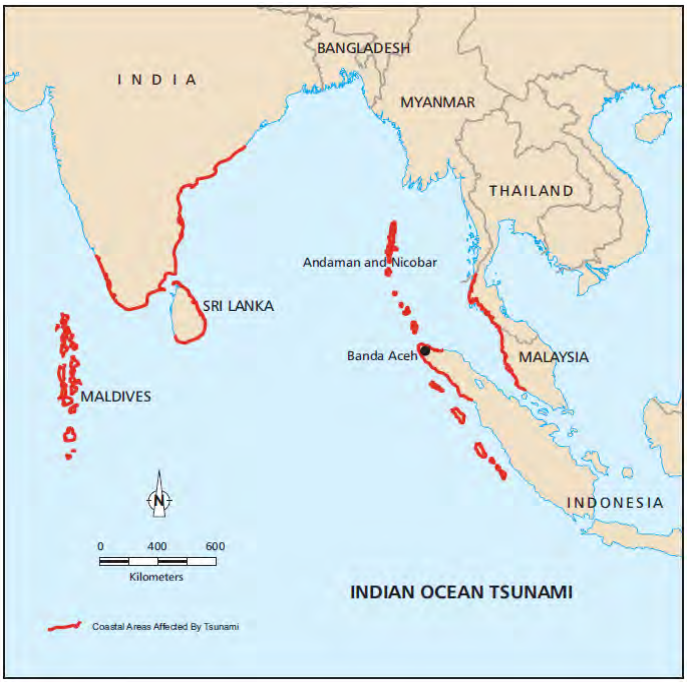
Summary of the Study:

This report summarizes ADB's response to the earthquake and tsunami during the first year. It highlights major activities, details project components, and identifies challenges ahead and lessons learned in responding to this unprecedented regional natural disaster.

Table 1: Tsunami Losses

Country	Number of			Estimated Overall Damage ($ billion)
	Dead	Missing	Displaced/ Injured	
India	12,405	5,640	6,913	2.560
Indonesia	131,029	37,000	556,638	4.500
Maldives	82	26	29,577	0.472
Sri Lanka	35,322		516,150	1.000
Thailand	5,395	2,817	54,500	0.711

Sources: Government of India; United Nations Development Programme; Government of the Maldives; Government of Sri Lanka; UN Resident Coordinator, Thailand.

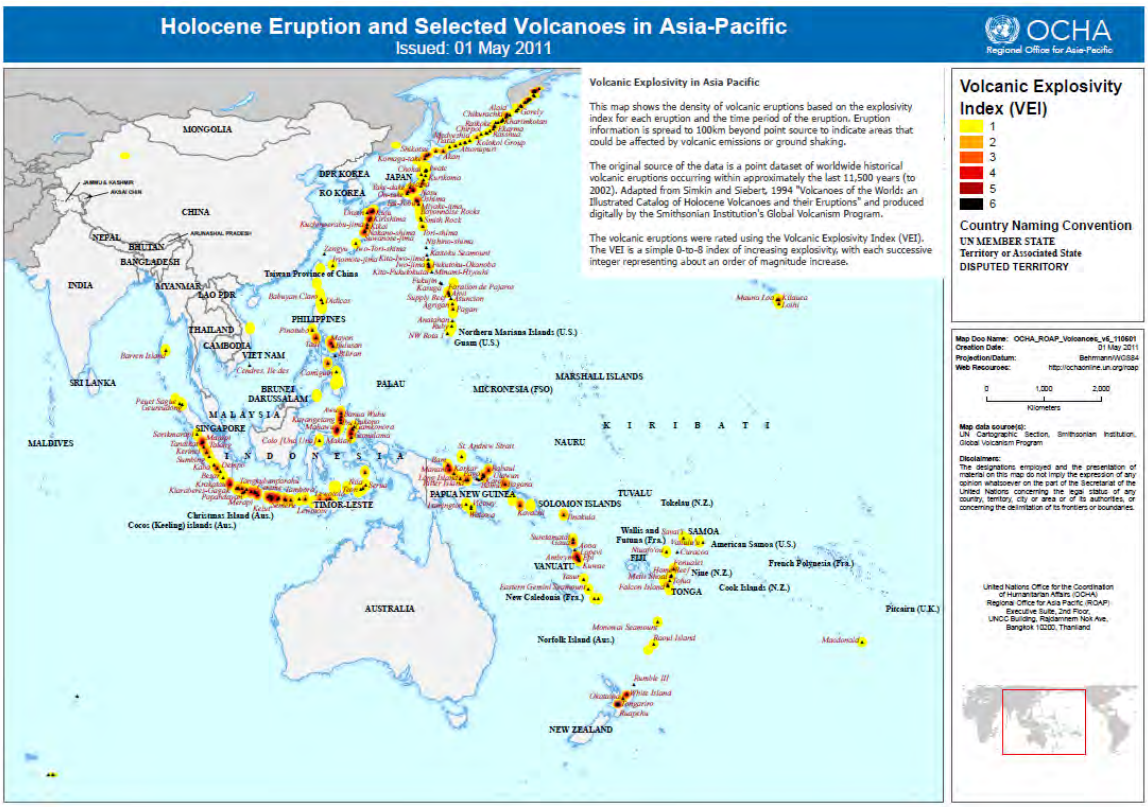


No.:	VE_001	Published Year:	2011
Study/ Report Name:	Holocene Eruption and Selected Volcanoes in Asia-Pacific		
Access to Information:	http://reliefweb.int/sites/reliefweb.int/files/resources/map_619.pdf		
Research Organization:	United Nations Office for the Coordination of Humanitarian Affairs, Regional Office for Asia Pacific (OCHA -ROAP)		
Study Area (Country):	Asia-Pacific		
Studied Hazard:	Volcanic Explosivity Index (VEI)		
Studied Damage/ Risk:			
Main Data Sources:	UN Cartographic Section, Smithsonian Institution, Global Volcanism Program		

Summary of the Study:

This map shows the density of volcanic eruptions based on the explosivity index for each eruption and the time period of the eruption. Eruption information is spread to 100km beyond point source to indicate areas that could be affected by volcanic emissions or ground shaking.

The volcanic eruptions were rated using the Volcanic Explosivity Index (VEI). The VEI is a simple 0 to 8 index of increasing explosivity, with each successive integer representing about an order of magnitude increase.



No.:	CM-001	Published Year:	2002
Study/ Report Name:	Overview of Early Warning in Cambodia, Indonesia, Lao PDR, Philippines and Vietnam		
Access to Information:	http://www.adpc.net/pdr-sea/publications/OEWS.pdf		
Research Organization:	Asian Disaster Preparedness Center		
Study Area (Country):	Indonesia, Vietnam, Philippines, Lao PDR, Cambodia		
Studied Hazard:	Storm(heavy rain)		
Studied Damage/ Risk:	Hazard		
Main Data Sources:			

Summary of the Study:

Globally, the incidence of hydro-meteorological disasters has doubled since 1996. In the past decade, more than 90% of the people killed by natural hazards and lost their lives due to droughts, windstorms and floods, of which 85% of the total deaths were reported from Asia (WDR, 2001). Strengthening disaster reduction strategies throughout the region is an important step towards ensuring that natural hazards do not result in social and economic disasters.

The UN International Decade on Natural Disaster Reduction (IDNDR) Conference on Early Warning Systems for Reduction of Natural Disasters (held in Potsdam, Germany in September 1998) declared that the successful application of early warning is the most practical and effective measure for disaster prevention. Ultimately, the declaration continues, early warning systems must be comprehended by and motivate communities at greatest risk, including those disenfranchised and particularly disadvantaged people who must take appropriate protective actions. One of IDNDR's original program targets was for all countries to have in place, by the year 2000, ready access to global, regional, national and local warning systems as part of their national plans. Many governments and related disaster management organizations throughout Asia have already initiated Early Warning Systems; though, the resulting systems vary widely in their capacity to produce and communicate effective warnings. This report summarizes the findings of a study of Early Warning Systems in Cambodia, Indonesia, Lao PDR, Philippines and Vietnam, the countries targeted by the Disaster Preparedness Program of the European Commission Humanitarian Aid Office (DIPECHO). The study, conducted in accordance with the IDNDR objectives, was undertaken by Asian Disaster Preparedness Center's Partnerships for Disaster Reduction-South East Asia (PDR-SEA) project, which emphasizes the need to address disaster related issues within the context of sustainable development, with communities targeted as major beneficiaries1. Most broadly, the project aims to develop the capacities of communities to prevent or mitigate the impact of disasters.

This report attempts to raise awareness of the early warning systems in the respective countries and to provide a basis for further enhancing institutional mechanisms, technical capacities and community response options for reducing vulnerability to extreme climate events. The study has the following objectives:

• Review the international initiatives on early warning system

• Conduct a rapid appraisal of existing early warning system for hydro-meteorological hazards in DIPECHO target countries, and

• Undertake short case studies to assess community-level vulnerability and response to hydro-meteorological hazards.

Huge populations in the selected countries are highly vulnerable to hydro-meteorological hazards as large numbers of communities are settled in risk prone marginal areas. Fertile flood valleys, plains and deltas, such as the Lower Mekong River basin, are attractive to farmers as they provide access to livelihoods; but they are also most vulnerable to floods.

In urban areas, burgeoning populations are in many instances located in areas vulnerable to hazards such as tropical storms. This study is limited to the EWS for hydrometeorological hazards focusing on tropical cyclone and floods as recommended in the proposal approved by the European Commission Humanitarian Aid Office (ECHO).

No.:	CM-02	Published Year:	2009
Study/ Report Name:	The Economics of Climate Change in Southeast Asia: A Regional Review		
Access to Information:	http://www.climatechange-foodsecurity.org/uploads/ABD_ec_climate-change-se-asia.pdf		
Research Organization:	UNESCO (ICHARM)/PERI		
Study Area (Country):	Indonesia, Philippines, Singapore, Thailand, Viet Nam (5 countries)		
Studied Hazard:			
Studied Damage/ Risk:	Hazard		
Main Data Sources:			

Summary of the Study:

The Economics of Climate Change in Southeast Asia: A Regional Review is the result of a 15-month long Asian Development Bank (ADB) technical assistance project, funded by the Government of the United Kingdom, which examines climate change issues in Southeast Asia, with a particular focus on Indonesia, Philippines, Singapore, Thailand, and Vietnam. The study is intended to enrich the debate on the economics of climate change that includes the economic costs and benefits of unilateral and regional actions. It seeks to raise awareness among stakeholders of the urgency of the grave challenges facing the region, and to build consensus of the governments, business sectors, and civil society on the need for incorporating adaptation and mitigation measures into national development planning processes. The study involves reviewing and scoping of existing climate studies, climate change modeling, and national and regional consultations with experts and policy-makers. It examines how vulnerable Southeast Asia is. to climate change, how climate change is impacting the region, what adaptation measures have been taken by the five study countries to-date, how great the region's potential is to reduce greenhouse gas (GHG) emissions in the future, how Southeast Asia can step up adaptation and mitigation efforts, and what the policy priorities are. Southeast Asia is highly vulnerable to climate change.

The study observed that climate change is already affecting Southeast Asia, with rising temperature, decreasing rainfall, rising sea levels, increasing frequency and intensity of extreme weather events leading to massive flooding, landslides and drought causing extensive damage to property, assets, and human life. Climate change is also exacerbating the problem of water stress, affecting agriculture production, causing forest fires, degrading forests, damaging coastal marine resources, and increasing outbreaks of infectious diseases. The report urges that Southeast Asian countries should treat adaptation as an extension of sustainable development practices. Its key elements include: adapting agricultural practices to changes in temperature and precipitation; adapting water management to greater risk of

floods and droughts; adapting coastal zone management to higher sea levels; safeguarding forest areas from forest fires and degradation; adapting people to threats of vector-borne infectious diseases. Southeast Asia countries need to take timely action to adapt to climate change, build resilience, and minimize the costs caused by the impact driven by GHG emissions that have been locked into the climate system.

Climate change is happening now in Southeast Asia, and the worst is yet to come. If not addressed adequately, it could seriously hinder the region's sustainable development and poverty eradication efforts—there is no time for delay. The review identifies a number of factors that explain why the region is particularly vulnerable. Southeast Asia's 563 million people are concentrated along coastlines measuring 173,251 kilometers long, leaving it exposed to rising sea levels. At the same time, the region's heavy reliance on agriculture for livelihoods—the sector accounted for 43% of total employment in 2004 and contributed about 11% of GDP in 2006—make it vulnerable to droughts, floods, and tropical cyclones associated with warming. Its high economic dependence on natural resources and forestry—as one of the world's biggest providers of forest products—also puts it at risk. An increase in extreme weather events and forest fires arising from climate change jeopardizes vital export industries.

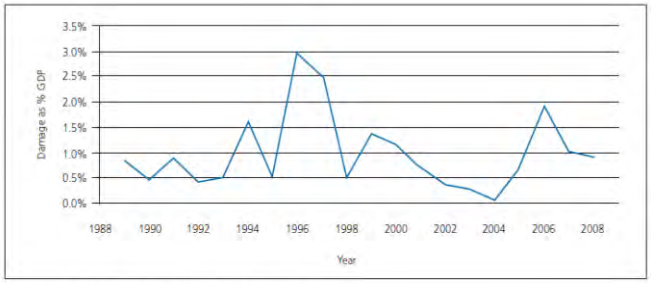
Rapid economic growth and structural transformation in Southeast Asia helped lift millions out of extreme poverty in recent decades. But poverty incidence remains high—as of 2005, about 93 million (18.8%) Southeast Asians still lived below the $1.25-a-day poverty line—and the poor are the most vulnerable to climate change. The review has also assessed a wide range of evidence of climate change and its impact in Southeast Asia to date. It tells a clear story: mean temperature increased at 0.1–0.3°C per decade between 1951 and 2000; rainfall trended downward during 1960—2000; and sea levels have risen 1–3 millimeters per year.

No.:	CM-007	Published Year:	2011
Study/ Report Name:	Weathering the Storm: Options for Disaster Risk Financing in Vietnam		
Access to Information:	http://www.gfdrr.org/sites/gfdrr.org/files/Viet%20Nam%20Fiscal%20Impact%20Study.pdf		
Research Organization:	World Bank		
Study Area (Country):	Vietnam		
Studied Hazard:			
Studied Damage/ Risk:	Hazard		
Main Data Sources:			

Summary of the Study:

Vietnam is one of the world's most exposed countries to multiple natural disasters, including tropical cyclones (typhoons), tornados, landslides and droughts. An estimated 59 percent of its total land area and 71 percent of its population are prone to cyclones and floods. The human and economic impacts of natural disasters are significant and could increase further in the future due to climate change. Over the past 20 years, natural disasters have resulted in the loss of over 13,000 lives and annual damage equivalent to an average 1 percent of GDP, including to residential housing and public-sector property, agriculture, and infrastructure. Moreover, there are rising concerns about the impact of climate change on the frequency and intensity of climatic hazards in Vietnam. The country has been identified as one of the five worst affected countries by climate change because a large proportion of the population, industry, infrastructure and agriculture are concentrated in the narrow coastal strip and low-lying Red River Basin and Mekong Delta (World Bank 2005a). The GoV has developed a strategy and institutional framework to strengthen Vietnam's resilience to disasters. Strengthening disaster management remains a priority for the GoV. The report has been prepared under the overall guidance of Victoria Kwakwa (Country Director, EACVF World Bank) and Hoonae Kim (Sector Manager, EASVS, World Bank).

Value of Natural Disasters as Percentage of Gross Domestic



Source: World Bank analysis of CCFSC damage data in VND.

In November 2007, the Government approved the National Strategy for Natural Disaster Prevention, Response and Mitigation to 2020. This strategy recommends the development of catastrophe risk financing solutions (including insurance) to complement other disaster risk management measures.

No.:	LS-007	Published Year:	2005
Study/ Report Name:	Natural Disaster Hotspots:A Global Risk Analysis		
Access to Information:	http://sedac.ciesin.columbia.edu/data/set/ndh-landslide-hazard-distribution/maps		
Research Organization:	World Bank、		
Study Area (Country):	Whole World		
Studied Hazard:	Flood, Landslide, Drought, drought,earthquakes, storms, volcanoes		
Studied Damage/ Risk:			
Main Data Sources:			

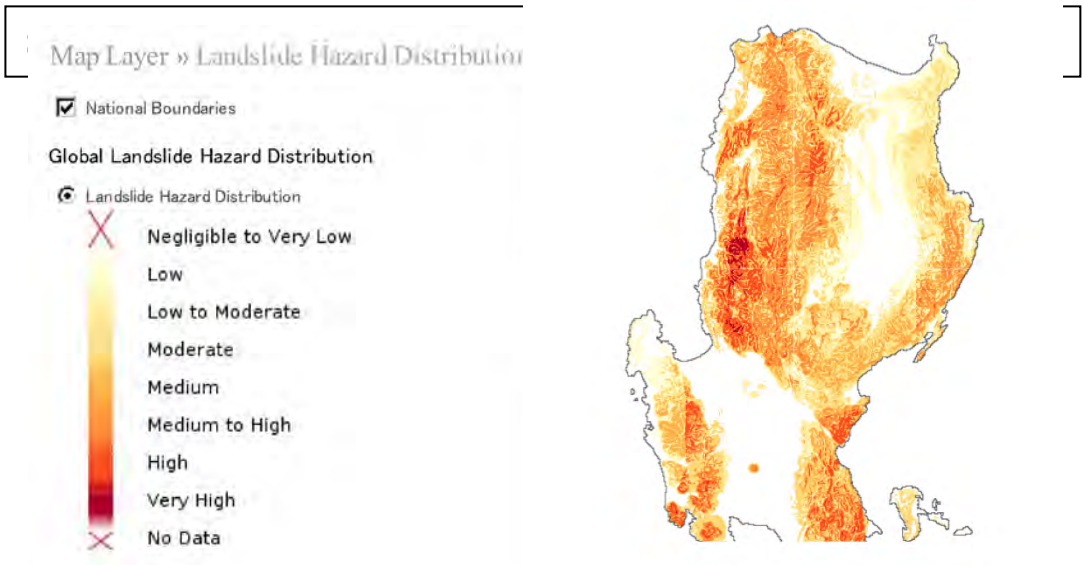
Summary of the Study:

1)overview

This study presents a global view of major natural disaster risk hotspots—areas at relatively high risk of loss from one or more natural hazards. It summarizes the results of an interdisciplinary analysis of the location and characteristics of hotspots for six natural hazards. Data on these hazards are combined with state-of-the-art data on the sub-national distribution of population and economic output and past disaster losses to identify areas at relatively high risk from one or more hazards.This study belongs to the project of Global Risk Identification Program (GRIP) by the world bank, which objects a framework which is improved evidence base for disaster risk management to enable the application and prioritisation of effective disaster risk reduction strategies at the national, regional and global scales.

2)

And a web site of CIESIN publishes detailed risk map of 6 hazards distribution studied in this project as shown in below. The maps are able to estimate risk levels at sub-national scales.



No.:	LS-008	Published Year:	2011
Study/ Report Name:	Disaster risk management programs for priority countries - 2nd edition		
Access to Information:	http://www.unisdr.org/we/inform/publications/20049		
Research Organization:	UNISDR(united nations office for disaster risk reduction)		
Study Area (Country):	Indonesia, Vietnam, Philippines, Lao PDR, Cambodia,		
Studied Hazard:	All natural hazards		
Studied Damage/ Risk:	Profile, management framework, activities about disaster risk		
Main Data Sources:	The world bank, EN-DAT		

Summary of the Study:

1)overview

This report is studying several aspects about disaster risk reduction, such as risk profile, management framework, activities and organization, concerning donor engagement and global facility to prepare comprehensive programs for disaster risk management and climate change adaptation for the next three to five years in each of the priority and donor earmarked countries by GFDRR (global facilities for disaster risk reduction). The following steps are undertaken to develop the country programs.

1. Investigation of a) the underlying risk factors and b) the progress in the five priority areas of the Hyogo Framework for Action;

2. stocktaking of ongoing risk reduction and climate change adaptation programs by key stakeholders, including UN agencies, multilateral and bilateral donors, and other partners;

3. identification of key gaps at national, sector, and local levels;

4. solicitation of proposals from different government and non-government entities and concerned donor agencies;

5. analysis of the solicited proposals and consensus building in a consultative process involving a range of stakeholders, including relevant government ministries, UN organizations, multilateral and bilateral donors, INGOs and civil society actors;

6. development of strategic comprehensive programs of support based on the gathered information.

2)Framework and assessment of present condition

In the report, those assessments are described as each countries separately.

1: Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation

2: Identify, assess and monitor disaster risks and enhance early warning

3: Use of knowledge, innovation, and education to build a culture of safety andresilience at all levels

4: Reduction of the underlying risk factors (reduction of exposure and vulnerability and

increase of resilience) 5: Disaster preparedness, recovery and reconstruction at national, regional, and local levels

No.:	LS-010	Published Year:	2009
Study/ Report Name:	Completion Report of Emergency Rehabilitation of Calamity Damage Project		
Access to Information:	http://www.adb.org/projects/40282		
Research Organization:	ADB		
Study Area (Country):	Vietnam		
Studied Hazard:	Flood, Landslide		
Studied Damage/ Risk:	hazard risk assessment		
Main Data Sources:	ADB fielded scoping missions in November 2005 and February 2006		

Summary of the Study:

1)overview

This project contains upgrade damaged infrastructures caused by a series of typhoons and floods in 2005 to protect them against future recurrence of disasters.

- Detailed terms of project are below.
- irrigation canals serving more than 18,286 ha of irrigated land
- 211.6 km of rural roads
- about 98.7 km of sea dikes and flood protection embankments
- 1 school

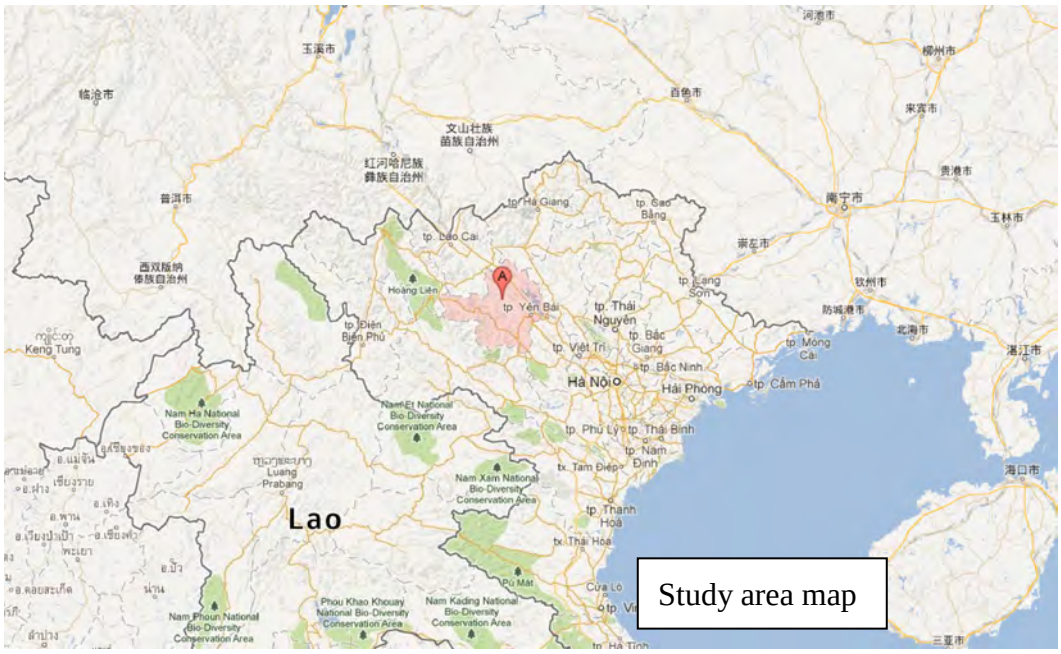
A technical assistance (TA) grant was provided for advisory assistance to the government in geo-information technology for hazard risk assessment in this project. The detail of hazard risk assessment is not clear in this report.

No.:	LS-011	Published Year:	2009
Study/ Report Name:	Geo-Information Technology for Hazard Risk Assessment		
Access to Information:	http://www.adb.org/projects/40282-012/main		
Research Organization:	ADB		
Study Area (Country):	Vietnam		
Studied Hazard:	Geo-hazard		
Studied Damage/ Risk:	inventory of at-risk facilities, and hazard maps		
Main Data Sources:	Project activities		

Summary of the Study:

1)overview

This project did case study of Geo-Information Technology for Hazard Risk Assessment in Yen Bai.



Other output is enhancement by technical assistance (TA) for Hazard Risk Assessment as shown below.

1:Improved ability to use a computer-based GIS to assess hazard risks and prepare visual presentations of vulnerability, including the capability to assess and present risk and vulnerability in economic, social, and physical terms

2:Capability built within the relevant disaster management agencies to operate and maintain the database and decision-making tools

3:Capacity built among faculty staff of WRU to use the training materials prepared under the TA.

No.:	LS-012	Published Year:	2009
Study/ Report Name:	Project for Building Disaster Resilient Societies in Central Region in Vietnam		
Access to Information:	http://libopac.jica.go.jp/images/report/P1000003692.html		
Research Organization:	JICA		
Study Area (Country):	Vietnam		
Studied Hazard:	water-related disasters		
Studied Damage/ Risk:	Disaster prevention ability of government and community		
Main Data Sources:			

Summary of the Study:

This report is the final report of JICA's technical supporting project for strengthening the community-centered disaster management (CCDM / CBDRM) systems in Central Vietnam. The project area is as shown in blow figure.

Study area map

To strengthen the measures against water-related disasters and adaptation to the increasing risk caused by climate change, these problems are remaining.

(1) Technique in dam management field

(2) Technical and scientific flood management by using river and rain observation in community

(3) River bank protection in Quang Ngai Province

(4) Additional technical transfer to fully utilize flood simulation and GIS

(5) Widen the target of CBDRM

(6) Technical transfer of tsunami

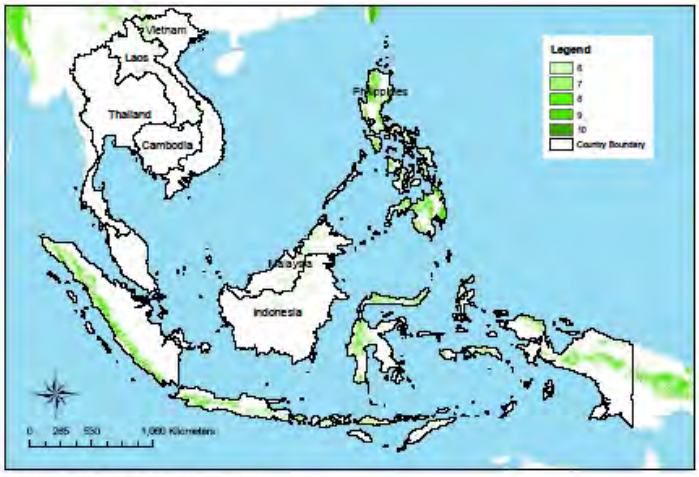
No.:	LS-013	Published Year:	2009
Study/ Report Name:	Climate Change Vulnerability Mapping for Southeast Asia		
Access to Information:	http://web.idrc.ca/uploads/user-S/12324196651Mapping_Report.pdf		
Research Organization:	Economy and Environment Program for Southeast Asia (EEPSEA)		
Study Area (Country):	ASEAN (Thailand, Vietnam, Laos, Cambodia, Indonesia, Malaysia, and Philippines)		
Studied Hazard:	Flood, Landslide, Drought, Tropical, cyclone Sea level rise		
Studied Damage/ Risk:	Vulnerability to climate change, flood frequency		
Main Data Sources:	Urban Extent Database (GRUMP version 1) of the (CIESIN) GEODATA portal (the Environmental Database; http://geodata.grid.unep.ch/extras/datasetlist.php) BAKOSURTANAL		

Summary of the Study:

This study assesses vulnerability of Southeast Asian countries (Thailand, Vietnam, Laos, Cambodia, Indonesia, Malaysia, and Philippines) of climate change including landslide. Vulnerability is defined as a function of exposure (potential loss due to a hazard), sensitivity (the potential gravity of losses and damage), and adaptive capacity (how much to adapt a hazard situation).

Adaptive capacity influences vulnerability. When adaptive capacity is low, vulnerability is high. Cambodia is among the most vulnerable in ASEAN despite its relatively low exposure to climate hazards. The eastern coast of Vietnam is susceptible to cyclones, but adaptive capacity is high to manage to moderate its vulnerability. Bangkok and Jakarta have high adaptive capacities but not enough to moderate their extreme vulnerability with high population densities and significant exposure to climate hazards.

A map shows annual landslide exposure of the region.



Appendix 2D. Landslide exposure (2005)

The map shows Landslide exposure changing rate caused by Climate change

Appendix 3:
List of Industrial Parks in Vietnam

ID	Short List	LongList	COUNTRY	PROVINCE	PARK NAME	ADDRESS
VN0001			Vietnam	Ho Chi Minh City	AN HA Industrial Park	7 An Hạ, Phạm Văn Hai, Hóc Môn Ho Chi Minh City, Vietnam
VN0002			Vietnam	Ho Chi Minh City	Binh Chieu Industrial Park	1083 TL-43, Bình Chiểu, Thu Duc District Ho Chi Minh City, Vietnam
VN0003			Vietnam	Ho Chi Minh City	Cat Lai II Industrial Park	Số 23, Cát Lái, Quận 2 Hồ Chí Minh, Vietnam
VN0004			Vietnam	Ho Chi Minh City	Cơ Khí Ô Tô TP HCM Industrial Park	cầu Tham Lương, Phường 15, Tân Bình Hồ Chí Minh
VN0005		**XXVN08**	Vietnam	Ho Chi Minh City	Dong Nam Industrial Park	8Binh My Minh City HoChi Minh
VN0006			Vietnam	Ho Chi Minh City	Hiep Phuoc Industrial Park	Liên Ấp 2, Hiệp Phước, Nhà Bè Ho Chi Minh City, Vietnam
VN0007			Vietnam	Ho Chi Minh City	Le Minh Xuan Industrial Park	Lê Đình Chi, Lê Minh Xuân, Bình Chánh Ho Chi Minh City, Vietnam
VN0008			Vietnam	Ho Chi Minh City	Linh Trung I Export Processing Zone	219-239 Lê Văn Chí, Linh Trung, Thu Duc District Ho Chi Minh City
VN0009		**XXVN13**	Vietnam	Ho Chi Minh City	Linh Trung II Industrial Park	1 Dương Công Khi, Tân Thới Nhì, Hóc Môn, Hồ Chí Minh
VN0010			Vietnam	Ho Chi Minh City	Phong Phu Industrial Park	Đường D21, Khu dân cư Intresco 13E, Phong Phú, Bình Chánh Ho Chi Minh City, Vietnam
VN0011			Vietnam	Ho Chi Minh City	Quang Trung Solfware Park	Water Tank Tân Chánh Hiệp, Quận 12, Ho Chi Minh City, Vietnam
VN0012		**XXVN28**	Vietnam	Ho Chi Minh City	Saigon Hi-Tech Park	Hi-Tech Park, Tăng Nhơn Phú A, Quận 9 Ho Chi Minh City, Vietnam
VN0013		**XXVN31**	Vietnam	Ho Chi Minh City	Tan Binh Industrial Park	Hẻm 14 Văn Chung, phường 13, Tan Binh District Ho Chi Minh City, Vietnam
VN0014			Vietnam	Ho Chi Minh City	Tan Phu Trung Industrial Park	57 Hương Lộ 2, Tân Phú Trung, Củ Chi Ho Chi Minh City, Vietnam
VN0015			Vietnam	Ho Chi Minh City	Tan Tao Industrial Park	AH 1, Tân Tạo, Bình Tân Ho Chi Minh City, Vietnam
VN0016			Vietnam	Ho Chi Minh City	Tan Thoi Hiep Industrial Park	365 Tân Thới Hiệp 1, Tân Thới Hiệp, Quận 12 Ho Chi Minh City, Vietnam
VN0017		**XXVN33**	Vietnam	Ho Chi Minh City	Tan Thuan Export Processing Zone	Tân Thuận, Tân Thuận Đông, Quận 7 Ho Chi Minh City, Vietnam
VN0018			Vietnam	Ho Chi Minh City	Tay Bac Cu Chi Industrial Park	cầu Tham Lương, Phường 15, Tân Bình Hồ Chí Minh
VN0019		**XXVN37**	Vietnam	Ho Chi Minh City	Vinh Loc Industrial Park	1 Vĩnh Lộc, Phạm Văn Hai, Bình Chánh Ho Chi Minh City, Vietnam
VN0020			Vietnam	Ho Chi Minh City	Cat Lai IV IZ	Số 23, Cát Lái, Quận 2 Hồ Chí Minh, Vietnam
VN0021			Vietnam	Ho Chi Minh City	North Western Cu Chi IZ	cầu Tham Lương, Phường 15, Tân Bình Hồ Chí Minh, Vietnam
VN0022			Vietnam	Ho Chi Minh City	Phu Huu Industrial Zone	235 Phan Trung, Tân Tiến, Biên Hòa tỉnh Đồng Nai
VN0023			Vietnam	Dong Nai	AGTEX Long Binh Industrial Park	235 Phan Trung, Tân Tiến, Biên Hòa tỉnh Đồng Nai
VN0024		**XXVN01**	Vietnam	Dong Nai	AMATA Industrial Park	112 Amata, Amata Industrial Park, Long Bình, Biên Hòa tỉnh Đồng Nai, Vietnam
VN0025			Vietnam	Dong Nai	An Phuoc Industrial Park	Đường A, Tam Phước, Tp. Biên Hòa tỉnh Đồng Nai, Vietnam
VN0026			Vietnam	Dong Nai	Bau Xeo Industrial Park	235 Phan Trung, Tân Tiến, Biên Hòa tỉnh Đồng Nai
VN0027			Vietnam	Dong Nai	Bien Hoa I Industrial Park	QL 1, Long Bình Tân, Tp. Biên Hòa tỉnh Đồng Nai, Vietnam
VN0028			Vietnam	Dong Nai	Bien Hoa II Industrial Park	C.P. Vietnam Corporation Bien Hoa 2 Industrial Park,, Biên Hòa, Dong Nai, Vietnam
VN0029			Vietnam	Dong Nai	Dau Giay Industrial Park	ĐT769, Dầu Giây, Thong Nhat District Dong Nai, Vietnam
VN0030			Vietnam	Dong Nai	Dinh Quan Industrial Park	289 Quốc lộ 20, tt. Định Quán, Định Quán Dong Nai, Vietnam

ID	Short List	LongList	COUNTRY	PROVINCE	PARK NAME	ADDRESS
VN0031			Vietnam	Dong Nai	Giang Dien Industrial Park	Khu Công Nghiệp Giang Điền, Giang Điền, Trảng Bom Dong Nai, Vietnam
VN0032			Vietnam	Dong Nai	Go Dau Industrial Park	235 Phan Trung, Tân Tiến, Biên Hòa tỉnh Đồng Nai
VN0033			Vietnam	Dong Nai	Ho Nai Industrial Park	12 Nguyễn Ái Quốc, Hố Nai, Biên Hòa tỉnh Đồng Nai, Vietnam
VN0034			Vietnam	Dong Nai	LOC AN BINH SON IP Industrial Park	ĐT769, Bình Sơn, Long Thanh District Dong Nai, Vietnam
VN0035		**XXVN14**	Vietnam	Dong Nai	Long Duc Industrial Park	Đường C, Tam Phước, Tp. Biên Hòa tỉnh Đồng Nai, Vietnam
VN0036			Vietnam	Dong Nai	Long Khanh Industrial Park	235 Phan Trung, Tân Tiến, Biên Hòa tỉnh Đồng Nai
VN0037		**XXVN16**	Vietnam	Dong Nai	Long Thanh Industrial Park	Nguyễn Văn Cừ, tt. Long Thành, Long Thanh District Dong Nai, Vietnam
VN0038		**XXVN17**	Vietnam	Dong Nai	Loteco Industrial Park	235 Phan Trung, Tân Tiến, Biên Hòa tỉnh Đồng Nai, Vietnam
VN0039		**XXVN20**	Vietnam	Dong Nai	Nhon Trach 1 Industrial Park	162 QL 20, Gia Tân 1, Thống Nhất, tỉnh Đồng Nai
VN0040			Vietnam	Dong Nai	Nhon Trach II – Loc Khang Industrial Park	Nguyễn Hữu Cảnh, Nhon Trach District Dong Nai,
VN0041			Vietnam	Dong Nai	Nhon Trach II – Nhon Phu Industrial Park	Nguyễn Hữu Cảnh, Nhon Trach District Dong Nai,
VN0042			Vietnam	Dong Nai	Nhon Trach II Industrial Park	Nguyễn Hữu Cảnh, Nhon Trach District Dong Nai,
VN0043			Vietnam	Dong Nai	Nhon Trach III Industrial Park	Nguyễn Hữu Cảnh, Nhon Trach District Dong Nai,
VN0044			Vietnam	Dong Nai	Nhon Trach IV Industrial Park	Nguyễn Hữu Cảnh, Nhon Trach District Dong Nai,
VN0045			Vietnam	Dong Nai	Nhon Trach Textile Industrial Park	Nguyễn Hữu Cảnh, Nhon Trach District Dong Nai,
VN0046			Vietnam	Dong Nai	Nhon Trach V Industrial Park	Nguyễn Hữu Cảnh, Nhon Trach District Dong Nai,
VN0047			Vietnam	Dong Nai	Ong Keo Industrial Park	105/5 Doc Mo Quốc lộ 20, Thong Nhat District Dong Nai, Vietnam
VN0048			Vietnam	Dong Nai	Song May Industrial Park	235 Phan Trung, Tân Tiến, Biên Hòa tỉnh Đồng Nai
VN0049			Vietnam	Dong Nai	Suoi Tre Industrial Park	AH1, Suối Tre, tx. Long Khánh Dong Nai, Vietnam
VN0050			Vietnam	Dong Nai	Tam Phuoc Industrial Park	Đường số 9, Tam Phước, Tp. Biên Hòa tỉnh Đồng Nai, Vietnam
VN0051			Vietnam	Dong Nai	Tan Phu Industrial Park	131 Nguyễn Tất Thành, tt. Tân Phú, Tân Phú Dong Nai, Vietnam
VN0052			Vietnam	Dong Nai	Thanh Phu Industrial Park	ĐT768, Tân Phong, Tp. Biên Hòa tỉnh Đồng Nai, Vietnam
VN0053			Vietnam	Dong Nai	Xuan Loc Industrial Park	Nguyễn Trãi, Xuân Hoà, tx. Long Khánh Dong Nai, Vietnam
VN0054			Vietnam	Dong Nai	Nhon Trach 6 IZ	Đường Số 6, Phước Thiền, Nhon Trach District Dong Nai, Vietnam
VN0055			Vietnam	Binh Duong	Ascendas-Protrade Singapore Tech Park	NA2, Mỹ Phước, Ben Cat District Binh Duong province, Vietnam
VN0056		**XXVN02**	Vietnam	Binh Duong	Bau Bang Industrial Park	Lai Vyen Commune,Ben Cat District Binh Duong Province
VN0057			Vietnam	Binh Duong	Binh An Textile Industrial Park	Bình Thung, Bình An, tx. Dĩ An Binh Duong province, Vietnam
VN0058			Vietnam	Binh Duong	Binh Duong Industrial Park	NA2, Mỹ Phước, Ben Cat District Binh Duong province
VN0059			Vietnam	Binh Duong	Dai Dang Industrial Park	NA2, Mỹ Phước, Ben Cat District Binh Duong province
VN0060			Vietnam	Binh Duong	Dat Cuoc Industrial Park	NO ADRESS
VN0061		**XXVN07**	Vietnam	Binh Duong	Dong An Industrial Park	NA2, Mỹ Phước, Ben Cat District Binh Duong province
VN0062			Vietnam	Binh Duong	Kim Huy Industrial Park	NA2, Mỹ Phước, Ben Cat District Binh Duong province
VN0063			Vietnam	Binh Duong	Mai Trung Industrial Park	NA2, Mỹ Phước, Ben Cat District Binh Duong province
VN0064			Vietnam	Binh Duong	Mapletree Business City @ Binh Duong	NA2, Mỹ Phước, Ben Cat District Binh Duong province

ID	Short List	LongList	COUNTRY	PROVINCE	PARK NAME	ADDRESS
VN0065			Vietnam	Binh Duong	Nam Tan Uyen Industrial Park	NA2, Mỹ Phước, Ben Cat District Binh Duong province
VN0066			Vietnam	Binh Duong	Phu Gia Industrial Park	ĐT743, Bình Chuẩn, Tan Uyen District Binh Duong province, Vietnam
VN0067			Vietnam	Binh Duong	Rach Bap Industrial Park	NA2, Mỹ Phước, Ben Cat District Binh Duong province
VN0068			Vietnam	Binh Duong	Song Than I Industrial Park	NA2, Mỹ Phước, Ben Cat District Binh Duong province
VN0069			Vietnam	Binh Duong	Song Than II Industrial Park	NA2, Mỹ Phước, Ben Cat District Binh Duong province
VN0070		**XXVN30**	Vietnam	Binh Duong	Song Than III Industrial Park	cầu vượt Sóng Thần, tx. Dĩ An Binh Duong province, Vietnam
VN0071			Vietnam	Binh Duong	Tan Dong Hiep A Industrial Park	23/4A Mạch Thị Liễu, Đông Chiêu, Tân Đông Hiệp, tx. Dĩ An Binh Duong province
VN0072			Vietnam	Binh Duong	Tan Dong Hiep B Industrial Park	23/4A Mạch Thị Liễu, Đông Chiêu, Tân Đông Hiệp, tx. Dĩ An Binh Duong province
VN0073		**XXVN36**	Vietnam	Binh Duong	Thoi Hoa Industrial Park	QL 13, Thới Hòa, Ben Cat District Binh Duong province, Vietnam
VN0074			Vietnam	Binh Duong	Viet Huong I Industrial Park	NA2, Mỹ Phước, Ben Cat District Binh Duong province
VN0075			Vietnam	Binh Duong	Viet Huong II Industrial Park	NA2, Mỹ Phước, Ben Cat District Binh Duong province
VN0076		**XXVN29**	Vietnam	Binh Duong	Viet Nam Singapore Industrial Park	8 Huu Nghi Avenue Thuan An District
VN0077			Vietnam	Binh Duong	Moc Bai OEZ	NA2, Mỹ Phước, Ben Cat District Binh Duong province
VN0078		**XXVN18**	Vietnam	Binh Duong	My Phuoc II IZ	D1, Mỹ Phước, Ben Cat District Binh Duong province, Vietnam
VN0079			Vietnam	Long An	An Nhut Tan Industrial Park	TL. 832, An Nhựt Tân, Tan Tru District Long An province, Vietnam
VN0080			Vietnam	Long An	Bac Tan Tap Industrial Park	Kinh Bac Dong tt. Tân Thạnh, Tân Thạnh, Long An province, Vietnam
VN0081			Vietnam	Long An	Cau Tram Industrial Park	QL 62, tp. Tân An Long An province, Vietnam
VN0082			Vietnam	Long An	Duc Hoa 3 - Anh Hong Industrial Park	TL 825, tt. Đức Hoà, Đức Hòa Long An province
VN0083			Vietnam	Long An	Duc Hoa 3 - Cali Long Duc Industrial Park	TL 825, tt. Đức Hoà, Đức Hòa Long An province
VN0084			Vietnam	Long An	Duc Hoa 3 - Dong Phuong Industrial Park	TL 825, tt. Đức Hoà, Đức Hòa Long An province
VN0085			Vietnam	Long An	Duc Hoa 3 - Duc Loi Industrial Park	TL 825, tt. Đức Hoà, Đức Hòa Long An province
VN0086			Vietnam	Long An	Duc Hoa 3 - Hong Dat Industrial Park	TL 825, tt. Đức Hoà, Đức Hòa Long An province
VN0087			Vietnam	Long An	Duc Hoa 3 - Lien Thanh Industrial Park	TL 825, tt. Đức Hoà, Đức Hòa Long An province
VN0088			Vietnam	Long An	Duc Hoa 3 - Long Viet Industrial Park	TL 825, tt. Đức Hoà, Đức Hòa Long An province
VN0089			Vietnam	Long An	Duc Hoa 3 - Minh Ngan Industrial Park	TL 825, tt. Đức Hoà, Đức Hòa Long An province
VN0090			Vietnam	Long An	Duc Hoa 3 - Muoi Day Industrial Park	TL 825, tt. Đức Hoà, Đức Hòa Long An province
VN0091			Vietnam	Long An	Duc Hoa 3 - Silico Industrial Park	TL 825, tt. Đức Hoà, Đức Hòa Long An province
VN0092			Vietnam	Long An	Duc Hoa 3 - Song Tan Industrial Park	TL 825, tt. Đức Hoà, Đức Hòa Long An province
VN0093			Vietnam	Long An	Duc Hoa I - Lucky Industrial Park	TL 825, tt. Đức Hoà, Đức Hòa Long An province
VN0094			Vietnam	Long An	Duc Hoa III - RESCO Industrial Park	TL 825, tt. Đức Hoà, Đức Hòa Long An province
VN0095			Vietnam	Long An	Duc Hoa III - Viet Hoa Industrial Park	TL 825, tt. Đức Hoà, Đức Hòa Long An province
VN0096			Vietnam	Long An	KCN Đức Hoà 3 - Thái Hoà Industrial Park	Số 1, Phường 4, tp. Tân An Long An province

ID	Short List	LongList	COUNTRY	PROVINCE	PARK NAME	ADDRESS
VN0097			Vietnam	Long An	Long Hau - Hoa Binh Industrial Park	Long Hậu, Can Giuoc District Long An province
VN0098		**XXVN15**	Vietnam	Long An	Long Hau Industrial Park	Long Hậu, Can Giuoc District Long An province -> new TT. Can Giuqc
VN0099			Vietnam	Long An	Nam Tan Tap Industrial Park	Số 1, Phường 4, tp. Tân An Long An province
VN0100			Vietnam	Long An	Nhut Chanh Industrial Park	TL. 832, Nhựt Chánh, Ben Luc District Long An province, Vietnam
VN0101			Vietnam	Long An	Phu An Thanh Industrial Park	Tỉnh lộ 827A, Hiệp Thạnh, Châu Thành Long An province, Vietnam
VN0102			Vietnam	Long An	Phuc Long Industrial Park	Số 1, Phường 4, tp. Tân An Long An province, Vietnam
VN0103			Vietnam	Long An	PHUOC DONG INDUSTRIAL PARK AND PORT	Quốc lộ 50, Phước Đông, Cần Đước Long An province, Vietnam
VN0104			Vietnam	Long An	Tan Buu - Long hiep Industrial Park	Unnamed Rd, Tân Bửu, Ben Luc District Long An province
VN0105			Vietnam	Long An	Tan Buu Industrial Park	Unnamed Rd, Tân Bửu, Ben Luc District Long An province
VN0106		**XXVN32**	Vietnam	Long An	Tan Duc Industrial Park	Duc Hoa Ha Street,Duc Hoa District
VN0107			Vietnam	Long An	Tan Kim Industrial Park	Đường mòn, Tân Kim, Can Giuoc District Long An province, Vietnam
VN0108			Vietnam	Long An	Tan thanh Industrial Park	ĐT829, tt. Tân Thạnh, Tân Thạnh Long An province, Vietnam
VN0109			Vietnam	Long An	Thai Hoa Industrial Park	Số 1, Phường 4, tp. Tân An Long An province
VN0110			Vietnam	Long An	Thanh Duc Industrial Park	TP Hồ Chí Minh -Trung Lương, Thạnh Đức, Ben Luc District Long An province, Vietnam
VN0111			Vietnam	Long An	Thuan Dao Industrial Park	Số 1, Phường 4, tp. Tân An Long An province
VN0112			Vietnam	Long An	Vinh Loc 2 Industrial Park	Số 1, Phường 4, tp. Tân An Long An province
VN0113			Vietnam	Long An	Xuyen A IZ	Số 1, Phường 4, tp. Tân An Long An province
VN0114			Vietnam	Ba Ria Vung Tau	Cai Mep Industrial Park	Tỉnh lộ 52, Dat Do District Ba Ria-Vung Tau province
VN0115			Vietnam	Ba Ria Vung Tau	Dat Do Industrial Park	Tỉnh lộ 44A, tt. Đất Đỏ, Dat Do District Ba Ria-Vung Tau province, Vietnam
VN0116			Vietnam	Ba Ria Vung Tau	Đô Thị Châu Đức Industrial Park	Tỉnh lộ 52, Dat Do District Ba Ria-Vung Tau province
VN0117			Vietnam	Ba Ria Vung Tau	Dong Xuyen Industrial Park	Tỉnh lộ 52, Dat Do District Ba Ria-Vung Tau province
VN0118			Vietnam	Ba Ria Vung Tau	Long Sơn Industrial Park	Cầu Long Sơn, tp. Vũng Tàu Ba Ria-Vung Tau province, Vietnam
VN0119		**XXVN19**	Vietnam	Ba Ria Vung Tau	My Xuan A Industrial Park	7 Quốc lộ 51, Mỹ Xuân, Tan Thanh District Ba Ria-Vung Tau province
VN0120			Vietnam	Ba Ria Vung Tau	My Xuan A2 Industrial Park	7 Quốc lộ 51, Mỹ Xuân, Tan Thanh District Ba Ria-Vung Tau province
VN0121			Vietnam	Ba Ria Vung Tau	My Xuan B1 – Dai Duong Industrial Park	7 Quốc lộ 51, Mỹ Xuân, Tan Thanh District Ba Ria-Vung Tau province
VN0122			Vietnam	Ba Ria Vung Tau	My Xuan B1 – Tien Hung Industrial Park	7 Quốc lộ 51, Mỹ Xuân, Tan Thanh District Ba Ria-Vung Tau province
VN0123			Vietnam	Ba Ria Vung Tau	My Xuan B1 Industrial Park	7 Quốc lộ 51, Mỹ Xuân, Tan Thanh District Ba Ria-Vung Tau province
VN0124		**XXVN22**	Vietnam	Ba Ria Vung Tau	Phu My I Industrial Park	Phu My Town,Tan Than District
VN0125			Vietnam	Ba Ria Vung Tau	Phu My II Industrial Park	NO ADRESS
VN0126			Vietnam	Ba Ria Vung Tau	Thanh Binh Phu My Industrial Park	Vung Tau province, Vietnam
VN0127			Vietnam	Ba Ria Vung Tau	Phu My III IZ	NO ADRESS
VN0128			Vietnam	Tay Ninh	Bourbon An Hoa Industrial Park	Bourbon, Tân Hưng, Tân Châu Tay Ninh province
VN0129			Vietnam	Tay Ninh	Linh Trung III Industrial Park	Bời Lời, Phan, Tay Ninh Tay Ninh province, Vietnam
VN0130			Vietnam	Tay Ninh	Phuoc Dong Industrial Park	ĐT782, Phước Đông, Gò Dầu Tay Ninh province, Vietnam

ID	Short List	LongList	COUNTRY	PROVINCE	PARK NAME	ADDRESS
VN0131			Vietnam	Tay Ninh	Trang Bang Industrial Park	Đường Chùa Am, Gia Lộc, Trang Bang District Tay Ninh province, Vietnam
VN0132			Vietnam	Tay Ninh	An Phu IZ	244 Tỉnh Lộ 15, An Phú, Củ Chi Ho Chi Minh City, Vietnam
VN0133			Vietnam	Tien Giang	An Phuoc Seaport - Gia Thuan Industrial Complex	108 Ấp Bắc, Phường 10, tp. Mỹ Tho Tien Giang
VN0134			Vietnam	Tien Giang	Long Giang Industrial Park	108 Ấp Bắc, Phường 10, tp. Mỹ Tho Tien Giang
VN0135			Vietnam	Tien Giang	My Tho Industrial Park	8 Rạch Gầm, 1, My Tho Tien Giang, Vietnam
VN0136			Vietnam	Tien Giang	Soai Rap Shipyard Industrial Park	AH 1, tp. Mỹ Tho Tien Giang, Vietnam
VN0137			Vietnam	Tien Giang	Tan Huong Industrial Park	AH 1, Tân Hương, Châu Thành Tien Giang, Vietnam
VN0138			Vietnam	Binh Phuoc	Bac Dong Phu Industrial Park	NO ADRESS
VN0139			Vietnam	Binh Phuoc	Binh Tan Industry Groups Industrial Complex	NO ADRESS
VN0140			Vietnam	Binh Phuoc	Chon Thanh Industrial Park	QL 13, tt. Chơn Thành, Chơn Thành Binh Duong province, Vietnam
VN0141			Vietnam	Binh Phuoc	Dong Xoai Industrial Park	QL 14, Tân Thiện, tx. Đồng Xoài Binh Phuoc province, Vietnam
VN0142			Vietnam	Binh Phuoc	Minh Hung - South Korea Industrial Park	QL 13, Minh Hưng, Chơn Thành Binh Duong province
VN0143			Vietnam	Binh Phuoc	Minh Hung III Industrial Park	QL 13, Minh Hưng, Chơn Thành Binh Duong province
VN0144			Vietnam	Binh Phuoc	Nam Dong Phu Industrial Park	Đập, Long Bình, Bù Gia Mập Binh Phuoc province
VN0145			Vietnam	Binh Phuoc	Saigon BinhPhuoc Industrial Zone	Đập, Long Bình, Bù Gia Mập Binh Phuoc province
VN0146			Vietnam	Binh Thuan	Ham Kiem I Industrial Park	Hồ Quang Cảnh, Thiện Trung, Phan Thiết Bình Thuận Province
VN0147			Vietnam	Binh Thuan	Ham Kiem II Industrial Park	Hồ Quang Cảnh, Thiện Trung, Phan Thiết Bình Thuận Province
VN0148			Vietnam	Binh Thuan	Phan Thiet I Industrial Park	139 Lê Lợi, Hưng Long, Phan Thiet Bình Thuận Province
VN0149			Vietnam	Binh Thuan	Phan Thiet II Industrial Park	139 Lê Lợi, Hưng Long, Phan Thiet Bình Thuận Province
VN0150			Vietnam	Binh Thuan	Son My I Industrial Park	Quốc lộ 55, Sơn Mỹ, Ham Tan District Bình Thuận Province, Vietnam
VN0151			Vietnam	Binh Thuan	Tan Duc Industrial Park	AH 1, Tân Đức, Ham Tan District Bình Thuận Province, Vietnam
VN0152			Vietnam	An Giang	BINH HOA Industrial Park	Quốc lộ 91, Chau Thanh District An Giang province, Vietnam
VN0153			Vietnam	An Giang	Binh Long Industrial Park	43 Trần Khánh Dư, chợ Cái Dầu, Cái Dâu, Chau Phu District An Giang province, Vietnam
VN0154			Vietnam	An Giang	Vam Cong Industrial Park	Lê Lợi, Tân Hiệp, tt. Chi Lăng, Tịnh Biên An Giang province, Vietnam
VN0155			Vietnam	BẠC LIÊU	GÀNH HÀO Industrial Park	151 Phan Ngọc Hiển, Ganh Hao, Dong Hai Bac Lieu province, Vietnam
VN0156			Vietnam	BẠC LIÊU	LANG TRAM Industrial Park	400-404 Võ Thị Sáu, Bac Lieu Bac Lieu province, Vietnam
VN0157			Vietnam	BẠC LIÊU	NINH QUỚI Industrial Park	hương lộ Vĩnh Quới, Vĩnh Quới, Ngã Năm Soc Trang, Vietnam
VN0158			Vietnam	BẠC LIÊU	SEA HABOUR SERVICE Industrial Park	2, Vĩnh Bình, Hòa Bình Bac Lieu province
VN0159			Vietnam	BẠC LIÊU	Tra Kha Industrial Park	2, Vĩnh Bình, Hòa Bình Bac Lieu province
VN0160			Vietnam	Ben Tre	An Hiep Industrial Park	TL 884, An Hiệp, Châu Thành Ben Tre province, Vietnam
VN0161			Vietnam	Ben Tre	Giao Long Industrial Park	883, Giao Long, Châu Thành Ben Tre province, Vietnam
VN0162			Vietnam	Ca Mau	Hoa Trung Industrial Park	40 Lý Bôn, LÂM THÀNH MẬU, 4, Ca Mau Vietnam

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VN0163			Vietnam	Ca Mau	Khanh An Industrial Park	Đường về U Minh, Khánh An, U Minh District Ca Mau, Vietnam
VN0164			Vietnam	Ca Mau	Nam Can Industrial Park	893 Nguyễn Tất Thành, tt. Năm Căn, Nam Can District Ca Mau, Vietnam
VN0165			Vietnam	Ca Mau	Song Doc Industrial Park	Đường Phú Mỹ, Phú Thuận, Phu Tan District Ca Mau, Vietnam
VN0166			Vietnam	Vinh Long	Binh Minh Industrial Park	107-109 Nguyễn Huệ, Phường 2, Vinh Long Vietnam
VN0167			Vietnam	Vinh Long	Co Chien Industrial Park	Nguyễn Đức Cảnh, Hung Binh, Vinh Nghe An, Vietnam
VN0168			Vietnam	Vinh Long	Hoa Phu Industrial Park	Bà Lan, Hoà Phú, Long Ho District Vinh Long, Vietnam
VN0169			Vietnam	Vinh Long	Tam Binh Industrial Complex	TL 905, Mỹ Thạnh Trung, Tam Binh District Vinh Long, Vietnam
VN0170			Vietnam	Dong Thap	Hau River Industrial Park	TL 847, Cao Lanh Dong Thap province
VN0171			Vietnam	Dong Thap	Sa Đec Industrial Park	TL 847, Cao Lanh Dong Thap province
VN0172			Vietnam	Dong Thap	Tran Quoc Toan Industrial Park	Nguyễn Văn Tiệp, Mỹ Phú, tp. Cao Lãnh Dong Thap province, Vietnam
VN0173			Vietnam	Tra Vinh	Long Duc Industrial Park	Đường số 1, Long Đức, tp. Trà Vinh Tra Vinh, Vietnam
VN0174			Vietnam	Cần Thơ	Bac O Mon Industrial Park	66 Nam Kỳ Khởi Nghĩa, Tân An, Ninh Kiều Cần Thơ, Vietnam
VN0175			Vietnam	Cần Thơ	Hung Phu 1 Industrial Park	Unnamed Rd, Hưng Phú, Cái Răng Cần Thơ
VN0176			Vietnam	Cần Thơ	Hung Phu 2A Industrial Park	Unnamed Rd, Hưng Phú, Cái Răng Cần Thơ
VN0177			Vietnam	Cần Thơ	Hung Phu 2B Industrial Park	Unnamed Rd, Hưng Phú, Cái Răng Cần Thơ
VN0178			Vietnam	Cần Thơ	O Mon Industrial Park	158 Trần Hưng Đạo, Châu Văn Liêm, Ô Môn Cần Thơ, Vietnam
VN0179			Vietnam	Cần Thơ	Thot Not 1 Industrial Park	QL 91, Thốt Nốt Cần Thơ
VN0180			Vietnam	Cần Thơ	Thot Not 2 Industrial Park	QL 91, Thốt Nốt Cần Thơ
VN0181			Vietnam	Cần Thơ	Thot Not Industrial Park	QL 91, Thốt Nốt Cần Thơ
VN0182			Vietnam	Cần Thơ	Tra Noc 1 Industrial Park	Nguyễn Thị Hồng Gấm, Trà Nóc, Bình Thủy Cần Thơ, Vietnam
VN0183			Vietnam	Cần Thơ	Tra Noc 2 Industrial Park	Nguyễn Thị Hồng Gấm, Trà Nóc, Bình Thủy Cần Thơ, Vietnam
VN0184			Vietnam	Soc Trang	An Nghiep Industrial Park	Tỉnh lộ 13, Mỹ Tú Soc Trang
VN0185			Vietnam	Soc Trang	Cai Con Industrial Complex	Tỉnh lộ 13, Mỹ Tú Soc Trang
VN0186			Vietnam	Soc Trang	Dai Ngai Industrial Park	542 60, Đại Ngãi, Long Phu District Soc Trang, Vietnam
VN0187			Vietnam	Soc Trang	Tran De Industrial Park	13 Nam Sông Hậu, tt. Trần Đề, Trần Đề Soc Trang, Vietnam
VN0188			Vietnam	Hau Giang	Phu Huu A Industrial Complex	Nam Sông Hậu, Phú Hữu A, Châu Thành Hau Giang province, Vietnam
VN0189			Vietnam	Hau Giang	Song Hau Industrial Park	NO ADRESS
VN0190			Vietnam	Hau Giang	Tan Phu Thanh Industrial Complex	286 Quốc lộ 1A, Tân Phú Thạnh, Châu Thành Hau Giang province, Vietnam
VN0191			Vietnam	Kiên Giang	Kien Luong II Industrial Park	QL 80, tt. Kiên Lương, Kiên Lương Kien Giang province
VN0192			Vietnam	Kiên Giang	Kien Luong Industrial Park	QL 80, tt. Kiên Lương, Kiên Lương Kien Giang province
VN0193			Vietnam	Kiên Giang	Tac Cau Industrial Park	QL 63, Hưng Yên, An Bien District Kien Giang province
VN0194			Vietnam	Kiên Giang	Thanh Loc Industrial Complex	Cầu, Thạnh Lộc, Giong Rieng District Kien Giang province, Vietnam
VN0195			Vietnam	Kiên Giang	Thuan Yen Industrial Complex	QL 80, Thuận Yến, Ha Tien Kien Giang province, Vietnam
VN0196			Vietnam	Kiên Giang	Xeo Ro Industrial Complex	QL 63, Hưng Yên, An Bien District Kien Giang province

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VN0197			Vietnam	Hà Nội City	Bac Thang Long Industrial Park	20-22 Lương Văn Can, Hàng Đào, Hoan Kiem District Hanoi
VN0198			Vietnam	Hà Nội City	Bac Thuong Tin Industrial Park	20-22 Lương Văn Can, Hàng Đào, Hoan Kiem District Hanoi
VN0199			Vietnam	Hà Nội City	Dong Anh Industrial Park	20-22 Lương Văn Can, Hàng Đào, Hoan Kiem District Hanoi
VN0200			Vietnam	Hà Nội City	Ha Noi - Dai Tu Industrial Park	20-22 Lương Văn Can, Hàng Đào, Hoan Kiem District Hanoi
VN0201			Vietnam	Hà Nội City	Khu Công nghệ cao Sinh học Industrial Park	20-22 Lương Văn Can, Hàng Đào, Hoan Kiem District Hanoi
VN0202			Vietnam	Hà Nội City	Nam Thang Long Industrial Park	20-22 Lương Văn Can, Hàng Đào, Hoan Kiem District Hanoi
VN0203			Vietnam	Hà Nội City	Noi Bai Industrial Park	20-22 Lương Văn Can, Hàng Đào, Hoan Kiem District Hanoi
VN0204		**XXVN23**	Vietnam	Hà Nội City	Phu Nghia Industrial Park	Ngõ 1194 - Láng, Láng Thượng, Đống Đa, Hà Nội
VN0205		**XXVN25**	Vietnam	Hà Nội City	Quang Minh Industrial Park	Quang Minh Commune,Me Linh District
VN0206			Vietnam	Hà Nội City	Sai Dong A Industrial Park	20-22 Lương Văn Can, Hàng Đào, Hoan Kiem District Hanoi
VN0207		**XXVN27**	Vietnam	Hà Nội City	Sai Dong B Industrial Park	Thach Ban Ward,Long Bien District
VN0208			Vietnam	Hà Nội City	Soc Son Industrial Park	20-22 Lương Văn Can, Hàng Đào, Hoan Kiem District Hanoi
VN0209			Vietnam	Hà Nội City	Thach That - Quoc Oai Industrial Park	20-22 Lương Văn Can, Hàng Đào, Hoan Kiem District Hanoi
VN0210		**XXVN34**	Vietnam	Hà Nội City	Thang Long Industrial Park	My Hao Hung Yen
VN0211			Vietnam	Hà Nội City	Quang Minh II IP	20-22 Lương Văn Can, Hàng Đào, Hoan Kiem District Hanoi
VN0212			Vietnam	Hà Nội City	Thang Long IP II - Japan	20-22 Lương Văn Can, Hàng Đào, Hoan Kiem District Hanoi
VN0213			Vietnam	Hà Nội City	Daewoo-Hanel (SDA) IP - Korea	20-22 Lương Văn Can, Hàng Đào, Hoan Kiem District Hanoi
VN0214			Vietnam	Hà Nội City	Dai Tu - Hanoi IP	20-22 Lương Văn Can, Hàng Đào, Hoan Kiem District Hanoi
VN0215		**XXVN12**	Vietnam	Hà Nội City	Hoa Lac Hi-tech Park	Đại lộ Thăng Long, Song Phương, Hoài Đức, Hà Nội
VN0216			Vietnam	Hà Nội City	Ninh Hiep IZ	20-22 Lương Văn Can, Hàng Đào, Hoan Kiem District Hanoi
VN0217			Vietnam	Hà Nội City	North Phu Cat IP	20-22 Lương Văn Can, Hàng Đào, Hoan Kiem District Hanoi
VN0218			Vietnam	Hà Nội City	Phung Hiep IP	20-22 Lương Văn Can, Hàng Đào, Hoan Kiem District Hanoi
VN0219			Vietnam	Vinh Phuc	Ba Thien Industrial Park	TL 302B, Bá Hiến, tx. Phúc Yên Vinh Phuc province, Vietnam
VN0220			Vietnam	Vinh Phuc	Binh Xuyen Industrial Park	Đường tỉnh 305B, Hương Canh, Bình Xuyên Vinh Phuc province, Vietnam
VN0221			Vietnam	Vinh Phuc	Chan Hung Industrial Park	TL 309, Vinh Tuong District Vinh Phuc province, Vietnam
VN0222			Vietnam	Vinh Phuc	Khai Quang Industrial Park	Nguyễn Tất Thành, Khai Quang, tp. Vĩ nh YênVinh Phuc province, Vietnam
VN0223			Vietnam	Vinh Phuc	Kim Hoa Industrial Park	TL 135, Thanh Xuân, Soc Son District Hanoi, Vietnam
VN0224		**XXVN25**	Vietnam	Vinh Phuc	Quang Minh IZ	Bắc Thăng Long - Nội Bài, Quang Minh, Mê Linh Hanoi, Vietnam
VN0225			Vietnam	Quảng Ninh	Cai Lan Industrial Park	QL 18, Cẩm Hải, tp. Cẩm Phả Quang Ninh province, Vietnam
VN0226			Vietnam	Quảng Ninh	Dong Mai Industrial Park	đường vào xã Sông Khoai, Đông Ma iHải Phòng, Vietnam
VN0227			Vietnam	Quảng Ninh	Hai Yen Industrial Park	Bến Mười, Hải Yên, tp. Móng Cái Quang Ninh province, Vietnam
VN0228			Vietnam	Quảng Ninh	Viet Hung Industrial Park	Đồng Đăng, Việt Hưng, Ha Long Quang Ninh province, Vietnam
VN0229			Vietnam	Bac Ninh	Nam Son - Hap Linh Industrial Park	Đê, Yen Dung District Bac Giang province, Vietnam
VN0230		**XXVN26**	Vietnam	Bac Ninh	Que Vo I Industrial Park	QL 18, tp. Bắc Ninh, Bắc Ninh
VN0231			Vietnam	Bac Ninh	Que Vo II Industrial Park	QL 18, Que Vo District Bac Ninh province

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VN0232			Vietnam	Bac Ninh	Que Vo III Industrial Park	QL 18, Que Vo District Bac Ninh province
VN0233			Vietnam	Bac Ninh	Thuan Thanh 1 Industrial Park	TL282, Thuan Thanh District Bac Ninh province
VN0234			Vietnam	Bac Ninh	Thuan Thanh II Industrial Park	TL282, Thuan Thanh District Bac Ninh province
VN0235			Vietnam	Bac Ninh	Thuan Thanh III Industrial Park	TL282, Thuan Thanh District Bac Ninh province
VN0236			Vietnam	Bac Ninh	Tien Son Industrial Park	84 Thiên Đức, Bac Ninh Bac Ninh province
VN0237			Vietnam	Bac Ninh	Yen Phong I Industrial Park	NO ADRESS
VN0238			Vietnam	Bac Ninh	Yen Phong II Industrial Park	NO ADRESS
VN0239		**XXVN06**	Vietnam	Bac Ninh	Dai Dong - Hoan Son Industrial Park	Dai Dong and Hoan Son Commune Tien Du District
VN0240			Vietnam	Bac Ninh	Do Thi Dai Kim Industrial Park	84 Thiên Đức, Bac Ninh Bac Ninh province
VN0241			Vietnam	Bac Ninh	Hanaka Industrial Park	84 Thiên Đức, Bac Ninh Bac Ninh province
VN0242			Vietnam	Bac Ninh	VSIP Bac Ninh IP	Trục chính VSIP, tx. Từ Sơn Bac Ninh province, Vietnam
VN0243	**XXVN38**	**XXVN38**	Vietnam	Hai Phong	Dinh Vu Industrial Park	4 Tran Phu Street, Ngo Quyen District,Hai Phong city
VN0244	**XXVN39**	**XXVN39**	Vietnam	Hai Phong	Do Son Industrial Park	TL 361, Đồng Tiến, Đồ Sơn Hải Phòng, Vietnam
VN0245	**XXVN40**	**XXVN40**	Vietnam	Hai Phong	Nam Cau Kien Industrial Park	8 Lý Thường Kiệt, Quang Trung, Hồng Bàng Hải Phòng
VN0246	**XXVN21**	**XXVN21**	Vietnam	Hai Phong	Nomura Industrial Park	TT.AN Duong , An Duong, Hai Phong
VN0247	**XXVN41**	**XXVN41**	Vietnam	Hai Phong	Trang Due Industrial Park	TL 208, An Dương Hải Phòng, Vietnam
VN0248	**XXVN42**	**XXVN42**	Vietnam	Hai Phong	Trang Cat Industrial Park	Near Hai An, Haipong, Vietnam
VN0249			Vietnam	Hai Phong	An Duong Industrial Park	Ngõ 185 Tôn Đức Thắng, Lê Chân Hải Phòng, Vietnam
VN0250			Vietnam	Hai Phong	Hai Phong 96 EPZ	Ngõ Trương Hán Siêu, An Biên, Lê Chân Hải Phòng, Vietnam
VN0251	**XXVN43**	**XXVN43**	Vietnam	Hai Phong	Vietnam Singapore Industrial Park(VSIP)	8 Lý Thường Kiệt, Quang Trung, Hồng Bàng Hải Phòng, Vietnam
VN0252			Vietnam	Hưng Yên	Det may Pho Noi B Industrial Park	QL 39 Hung Yen province
VN0253			Vietnam	Hưng Yên	Minh Duc Industrial Park	QL 39 Hung Yen province
VN0254			Vietnam	Hưng Yên	Pho Noi A Industrial Park	QL 39, Pho Noi, Liêu Xá, Yên Mỹ Hung Yen province, Vietnam
VN0255		**XXVN35**	Vietnam	Hưng Yên	Thang Long 2 Industrial Park	QL 39 Hung Yen province -> My Hao Hung Yen
VN0256			Vietnam	Hưng Yên	Yen My II Industrial Park	Vĩnh Hưng, tt. Yên Mỹ, Yên Mỹ Hung Yen province, Vietnam
VN0257			Vietnam	Hưng Yên	Minh Quang Industrial Park	QL 39 Hung Yen province
VN0258			Vietnam	Hưng Yên	Pho Noi B Industrial Park	QL 39, Pho Noi, Liêu Xá, Yên Mỹ Hung Yen province, Vietnam
VN0259			Vietnam	Hưng Yên	Phu Hung Industrial Zone	QL 39, Tiên Cầu, tt. Lương Bằng, Kim Động Hung Yen province, Vietnam
VN0260			Vietnam	Hưng Yên	Tan Tao AGRIMECO Energy Mechanic Industrial Park	QL 39 Hung Yen province
VN0261		**XXVN05**	Vietnam	Hải Dương	Dai An Industrial Park	TL 280, Thuận Thành, Bắc Ninh
VN0262			Vietnam	Hải Dương	Lai Cach Industrial Park	174 Nguyễn Lương Bằng, Hai Duong
VN0263			Vietnam	Hải Dương	Nam Sach Industrial Park	174 Nguyễn Lương Bằng, Hai Duong
VN0264		**XXVN24**	Vietnam	Hải Dương	Phuc Dien Industrial Park	Phuc Dien Commune, Cam Giang District
VN0265			Vietnam	Hải Dương	Tân Trường Industrial Park	174 Nguyễn Lương Bằng, Hai Duong
VN0266			Vietnam	Hải Dương	Cong Hoa IP	AH 14, Lai Khê, Cộng Hòa, Kim Thanh District Hai Duong, Vietnam

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VN0267			Vietnam	Hải Dương	Luong Dien-Cam Dien IP	174 Nguyễn Lương Bằng, Hai Duong
VN0268			Vietnam	Hải Dương	Tau Thuy-Lai Vu IP	174 Nguyễn Lương Bằng, Hai Duong
VN0269			Vietnam	Hải Dương	Viet Hoa-Kenmark IP	174 Nguyễn Lương Bằng, Hai Duong
VN0270			Vietnam	Hà Nam	Châu Sơn Industrial Park	Đường Phủ Lý - Kiện Khê, Châu Sơn, tp. Phủ Lý Ha Nam province, Vietnam
VN0271		**XXVN09**	Vietnam	Hà Nam	Đồng Văn II Industrial Park	AH 1, Đồng Văn, tt. Đồng Văn, Duy Tien District Ha Nam province, Vietnam
VN0272			Vietnam	Hà Nam	Dong Van IP	AH 1, Tiên Tân, Duy Tien District Ha Nam province, Vietnam
VN0273			Vietnam	Bắc Giang	Quang Châu Industrial Park	Đê, Bac Giang Bac Giang province
VN0274			Vietnam	Bắc Giang	Dinh Tram IZ (1st & 2 nd phases)	Đê, Bac Giang Bac Giang province
VN0275			Vietnam	Bắc Giang	Song Khe-Noi Hoang Industrial Park	AH 1, Yen Dung District Bac Giang province, Vietnam
VN0276			Vietnam	Bắc Giang	Viet Han Industrial Park	NO ADRESS
VN0277			Vietnam	Da Nang	Da Nang Aquatic Product Service Industrial Park	kiệt 408 Hoàng Diệu, Hòa Thuận Đông, Hải Châu Da Nang
VN0278		**XXVN04**	Vietnam	Da Nang	Da Nang Industrial Park	58 Nauyen Chi Thanh, Quan Hai Chau
VN0279		**XXVN10**	Vietnam	Da Nang	Hoa Cam Industrial Park	THAC GIAN, Thanh Khe Da Nang
VN0280		**XXVN11**	Vietnam	Da Nang	Hoa Khanh Industrial Park	118 Nguyễn Lương Bằng, Hòa Khánh Bắc, Liên Chiểu, Đà Nẵng
VN0281			Vietnam	Da Nang	Hoa Khanh - expanded	kiệt 408 Hoàng Diệu, Hòa Thuận Đông, Hải Châu Da Nang
VN0282			Vietnam	Da Nang	Lien Chieu Industrial Park	AH 1, Hòa Hiệp Bắc, Liên Chiểu Da Nang, Vietnam
VN0283			Vietnam	Da Nang	Widen Hoa Khanh Industrial Park	kiệt 408 Hoàng Diệu, Hòa Thuận Đông, Hải Châu Da Nang
VN0284		**XXVN03**	Vietnam	Danang City	Da Nang Hi Tech Park	Da Nang Hi Tech Park, Hoa Lien Commune, Hoa Vang District
VN0285			Vietnam	Thua Thien Hue	Phú Bài Industrial Park	Lê Trọng Tấn, tt. Phú Bài, Hương Thủy Thua Thien-Hue, Vietnam
VN0286			Vietnam	Khanh Hoa	Bắc Cam Ranh Industrial Park	NO ADRESS
VN0287			Vietnam	Khanh Hoa	Nam Cam Ranh Industrial Park	50 Trần Phú, Lộc Thọ, Nha Trang Khánh Hoà, Vietnam
VN0288			Vietnam	Khanh Hoa	Ninh Thuy Industrial Park	1B, Ninh Thủy, tx. Ninh Hòa Khanh Hoa province, Vietnam
VN0289			Vietnam	Khanh Hoa	Suoi Dau Industrial Park	TL 654, Cam An Bắc, Cam Lâm Khanh Hoa province, Vietnam
VN0290			Vietnam	Khanh Hoa	Vạn Thắng Industrial Park	Hà Thanh, Vạn Thắng, Nha Trang Khánh Hoà, Vietnam
VN0291			Vietnam	Quang Ngai	Dung Quat Industrial Park	63 Nguyễn Du, Nghĩa Chánh, Quang Ngai Quảng Ngãi Province
VN0292			Vietnam	Quang Ngai	Pho Phong Industrial Park	AH132, Phổ Phong, Đức Phổ Quảng Ngãi Province, Vietnam
VN0293			Vietnam	Quang Ngai	Quang Phu Industrial Park	108 Hoàng Văn Thụ, Quảng Phú, Quang Ngai Quảng Ngãi Province, Vietnam
VN0294			Vietnam	Quang Ngai	Tam Anh Industrial Park	63 Nguyễn Du, Nghĩa Chánh, Quang Ngai Quảng Ngãi Province
VN0295			Vietnam	Quang Ngai	Tam Thang Industrial Park	63 Nguyễn Du, Nghĩa Chánh, Quang Ngai Quảng Ngãi Province
VN0296			Vietnam	Quang Ngai	Tinh Phong Industrial Park	AH 1, Tịnh Phong, Son Tinh District Quảng Ngãi Province, Vietnam
VN0297			Vietnam	Quang Nam	Dien Nam - Dien Ngoc Industrial Park	Đi biển Tam Thăng, Tam Thăng, tp. Tam Kỳ Quang Nam province
VN0298			Vietnam	Quang Nam	Dong Que Son Industrial Park	Đi biển Tam Thăng, Tam Thăng, tp. Tam Kỳ Quang Nam province
VN0399			Vietnam	Quang Nam	Mechanical Chu Lai Truong Hai Industrial Park	Đi biển Tam Thăng, Tam Thăng, tp. Tam Kỳ Quang Nam province
VN0300			Vietnam	Quang Nam	North Chu Lai Industrial Park	Đi biển Tam Thăng, Tam Thăng, tp. Tam Kỳ Quang Nam province

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VN0301			Vietnam	Quang Nam	Phu Xuan Industrial Park	35 Trần Phú, Tân Thạnh, Tam Ky Quang Nam province, Vietnam
VN0302			Vietnam	Quang Nam	Tam Hiep Industrial Park	AH 1, Tam Hiệp, Nui Thanh District Quang Nam province, Vietnam
VN0303			Vietnam	Quang Nam	Thuan Yen Industrial Park	Đi biển Tam Thăng, Tam Thăng, tp. Tam Kỳ Quang Nam province, Vietnam
VN0304			Vietnam	Binh Dinh	Hoa Hoi Industrial Park	632, Phu My District Binh Dinh province, Vietnam
VN0305			Vietnam	Binh Dinh	Long My Industrial Park	NO ADRESS
VN0306			Vietnam	Binh Dinh	Nhon Hoa Industrial Park	630, Hoai An District Binh Dinh province, Vietnam
VN0307			Vietnam	Binh Dinh	Nhon Hoi A Industrial Park	608 Trần Hưng Đạo, tp. Quy Nhơn Binh Dinh province
VN0308			Vietnam	Binh Dinh	Nhon Hoi B Industrial Park	608 Trần Hưng Đạo, tp. Quy Nhơn Binh Dinh province
VN0309			Vietnam	Binh Dinh	Nhon Hoi C Industrial Park	608 Trần Hưng Đạo, tp. Quy Nhơn Binh Dinh province
VN0310			Vietnam	Binh Dinh	Phu Tai Industrial Park	Quốc lộ 1D, Quang Trung, tp. Quy Nhơn Binh Dinh province, Vietnam
VN0311			Vietnam	Phu Yen	An Phu Industrial Park	AH 1, An Phú, tp. Tuy Hòa Phu Yen province, Vietnam
VN0312			Vietnam	Phu Yen	Dong Bac Song Cau Industrial Park	Mậu Thân, Phường 9, tp. Tuy Hòa Phu Yen province, Vietnam
VN0313			Vietnam	Phu Yen	Hoa Hiep Industrial Park	AH 1, Hòa Hiệp, Xuân Thịnh, tx. Sông Cầu Phu Yen province, Vietnam
VN0314			Vietnam	Gia Lai	Tra Da Industrial Park	Nguyễn Xí, Trà Đa, tp. Pleiku Gia Lai province, Vietnam
VN0315			Vietnam	Dak Nong	Tam Thang Industrial Park	446 Nguyễn Tất Thành, Tâm Thắng, Cu Jut District Dak Nong, Vietnam
VN0316			Vietnam	Dak Lak	Hòa Phú Industrial Park	AH17, Hòa Phú, Buon Ma Thuot Dak Lak province, Vietnam
VN0317			Vietnam	Hà Giang	Binh Vang Industrial Park	QL2, Phương Thiện, Ha Giang Vietnam
VN0318			Vietnam	Tuyên Quang	Long Binh An Industrial Park	Đinh Tiên Hoàng, Tân Quang, tp. Tuyên Quang Tuyen Quang, Vietnam
VN0319			Vietnam	Bắc Kạn	Thanh Binh Industrial Park	Cầu, Thanh Bình, Chợ Mới Bac Kan province, Vietnam
VN0320			Vietnam	Thái Nguyên	Song Cong Industrial Park	đường Thắng Lợi, Lương Châu, tx. Sông Công Thai Nguyen province, Vietnam
VN0321			Vietnam	Phú Thọ	Thuy Van Industrial Park	Đồng Rạc, Ngọc Đồng, Yên Lập Phu Tho province
VN0322			Vietnam	Phú Thọ	Trung Ha Industrial Park	Đồng Rạc, Ngọc Đồng, Yên Lập Phu Tho province
VN0323			Vietnam	Hòa Bình	Luong Son Industrial Park	AH 13, Lâm Sơn, Lương Sơn Hoa Binh, Vietnam
VN0324			Vietnam	Thái Binh	Phuc Khanh Industrial Park	458 TL 223, Đề Thám, Thai Binh Thai Binh province, Vietnam
VN0325			Vietnam	Thái Binh	Nguyen Duc Canh Industrial Park	NO ADRESS
VN0326			Vietnam	Thái Binh	Gia Le Industrial Park	458 TL 223, Đề Thám, Thai Binh Thai Binh province
VN0327			Vietnam	Thái Binh	Tien Hai Industrial Park	458 TL 223, Đề Thám, Thai Binh Thai Binh province

ID	Short List	LongList	COUNTRY	PROVINCE	PARK NAME	ADDRESS
VN0328			Vietnam	Thái Binh	Cau Nghin Industrial Park	cầu Nghìn, tt. An Bài, Quynh Phu District Thai Binh province, Vietnam
VN0329			Vietnam	Thái Binh	Song Tra Industrial Park	NO ADRESS
VN0330			Vietnam	Nam Định	Hoa Xa Industrial Park	Ngõ 6 Năng Tĩnh, Năng Tĩnh, Nam Dinh Nam Dinh province
VN0331			Vietnam	Nam Định	My Trung Industrial Park	Đê sông Hồng, làng Hữu Bị A, Mỹ Trung, Mỹ Lộc Nam Dinh province, Vietnam
VN0332			Vietnam	Nam Định	Bao Minh Industrial Park	Ngõ 6 Năng Tĩnh, Năng Tĩnh, Nam Dinh Nam Dinh province
VN0333			Vietnam	Ninh Bình	Ninh Phuc Industrial Park (1st, 2nd phase & expansion)	NO ADRESS
VN0334			Vietnam	Ninh Bình	Khanh Phu Industrial Park	QL 10, Yên Vệ, Khánh Phú, Yen Khanh District Ninh Binh province, Vietnam
VN0335			Vietnam	Ninh Bình	Gian Khau Industrial Park	NO ADRESS
VN0336			Vietnam	Thanh Hoa	Le Mon IZ	Đỗ Huy Cư, Lễ Môn, Đông Hải, tp. Thanh Hoá Thanh Hoa province, Vietnam
VN0337			Vietnam	Nghe An	Bac Vinh IZ	125 Le Hong Phong, Trường Thi, Vinh Nghe An, Vietnam
VN0338			Vietnam	Nghe An	Nam Cam IZ (phase 1)	QL 7, Pù Mát, Lạng Khê, Con Cuong District Nghe An, Vietnam
VN0339			Vietnam	Nghe An	Hoang Mai IZ	AH 1, tt. Hoàng Mai, Quynh Luu District Nghe An, Vietnam
VN0340			Vietnam	Ha Tinh	Vung Ang I IZ	106 Phan Đình Phùng, Tân Giang, tp. Hà Tĩnh Hà Tĩnh, Vietnam
VN0341			Vietnam	Quang Binh	Hon La IZ 1st phase	565, Phong Nha-Ke Bang National Park, Tân Trạch, Bo Trach District Quang Binh province
VN0342			Vietnam	Quang Binh	Notth Western Dong Hoi IZ	565, Phong Nha-Ke Bang National Park, Tân Trạch, Bo Trach District Quang Binh province
VN0343			Vietnam	Quang Tri	Nam Dong Ha IZ	Lương Khánh Thiện, Phường 5, Quang Tri Quang Tri province, Vietnam
VN0344			Vietnam	Kon Tum	Sao Mai (Phase 1) IZ	300 Trần Hưng Đạo, Quyết Thắng, Kon Tum Kon Tum province, Vietnam
VN0345			Vietnam	Lam Dong	Loc Son IZ	Tố Hữu, Lộc Sơn, tp. Bảo Lộc Lam Dong province, Vietnam
VN0346			Vietnam	Ninh Thuan	Du Long Industrial Park	39 Thống Nhất, Đài Sơn, Phan Rang Ninh Thuan province, Vietnam
VN0347		**XXVN03**	Vietnam	Danang City	Da Nang Hi Tech Park	Da Nang city

Appendix 4:
General Investment Risk of Vietnam

(1) Political Risk

Vietnam enjoys a high degree of political stability, as a result of the uncontested dominance of the Communist Party of Vietnam (CPV). The apex of political power the CPV is the 15-member Politburo and the 150-member Central Committee, which represent the principal policy-making organs of the state. Broad policy is in theory set every five years at the party congresses. A National Assembly of 498 members is elected popularly every five years. Although this assembly traditionally does not hold real power, it is gaining momentum as a public forum and non-party members are increasingly allowed to contest local constituencies. These bodies are divided between the 'reformist' and 'conservative' factions of the CPV.

Reformist Prime Minister Nguyen Tan Dung was re-elected in July 2011 and is regarded as the head of Vietnam's new generation of leaders. However, President Truong Tan Sang and the CPV's Secretary General Nguyen Phu Trong are opposed to Dung. A source in Vietnam reports that the Politburo held a secret meeting in June 2012 in which both the President and the Secretary General voted to remove Dung. Dung retained his position because of his support amongst other Politburo members and Deputy Prime Minister Nguyen Xuan Phuc. In October 2012, the Central Committee held a two-week meeting to assess Prime Dung's progress on the back of the economy's poor performance, but he retained his position again. Despite the fractious leadership, it is unlikely that the Dung will be removed in the next year as he has enough support in the Politburo and the CPV to hold power. Moreover, the CPV does not favor unscheduled leadership change as it would disrupt unity within the Party.

We assess that the current policy of gradually opening up the economy while maintaining one-party authority will continue to benchmark political governance in Vietnam. The CPV hopes that by securing continuing economic growth it will be able to satisfy the social and material needs of its people, thereby quelling discontent and demands for greater political and social freedoms. The government is likely to continue its focus on attracting FDI, most of which comes from within Asia. The government is likely to continue with privatization plans for state-owned firms but there are likely to be far fewer privatization projects in the next three years as the CPV deliberates such moves much more thoroughly. In the unlikely event that Dung is removed, we would not expect any policy changes.

There is no indication at present that the government will adopt a multi-party system of governance. The CPV is credited with improving living standards and establishing internal security. Opposition parties are illegal and wield limited support; most pro-democracy groups have been established by the Vietnamese diaspora who pose little challenge to the CPV.

(2) Economic Risk

Vietnam has made considerable developmental strides over the past decade, thanks primarily to a multifold expansion in external trade following entry into the World Trade Organization (WTO) in 2007. Unfortunately, the reform drive has slowed in recent years, with headlines grabbed by far more negative trends such as high inflation, external imbalances, and banking sector troubles. Lack of transparency about the performance of both state-owned companies and the banking sector hinders analysis and hints to considerable hidden risks.

Vietnam has been struggling with serious macroeconomic imbalances for the past few years and the road ahead remains difficult. While some risks have diminished, others have come to the fore. Inflation has eased markedly and the trade deficit has turned to a surplus in 2012, helping rebuild the foreign-exchange reserve cushion. But non-performing loans in the banking sector have risen to almost 9.0% of the total and there have been persistent fears of a systemic crisis. Meanwhile, foreign direct investment remains sluggish, partly due to the slow recovery in global foreign direct investment flows, but even more importantly due to Vietnam's own problems, which have diverted potential funds elsewhere. Positively, the government has laid out a plan to more directly address banking-sector woes, including the creation of a new agency to handle bad debts. Resolving these problems will take years, however. Meanwhile, in the context of persistently weak external demand, and tight macroeconomic policies domestically, growth will remain sluggish. We anticipate the economy to only gain 5.2% in 2013, little better than the 2012 5.0% expansion. Performance should pick up more noticeably in 2014, but even then growth is expected to remain below the 6.0% mark.

Longer-term issues relate to the state's still-significant economic presence and its dominance of the financial sector, which undermines bank lending profitability, crowds out private investment, and undermines the health of the entire financial sector. Infrastructure development has not kept up with economic growth, leading to costly bottlenecks and pushing operating costs higher than in other countries in Asia. Electricity production, as well as port capacity, must expand quickly and substantially

to keep up with booming demand. If this is not done, the country's hopes of becoming a regional manufacturing powerhouse may be stalled. The education system is also in dire need of business-oriented reforms to address skilled-labor shortages that are increasingly becoming a top investor concern. In addition, reform of state-owned enterprises remains inhibited by concerns over associated socioeconomic dislocations and their impact on the legitimacy of the Communist Party.

(3) Legal Risk

Vietnam's legal system is based on civil law, communist legal theory and the French civilian law system. The current constitution of Vietnam was adopted in 1992, and has only been amended once in 2001. Vietnam is currently in process of amending the constitution, and the revised constitution is expected to come into effect in 2014.

The legal system in Vietnam is evolving quickly from a base of limited experience with commercial law. Two key pieces of legislation, namely the Investment Law (IL) and the Enterprise Law (EL), were introduced in 2006, harmonizing the legal framework for business and investment. Under these laws, several types of business entities are possible: a wholly foreign-owned enterprise (either a limited-liability company or a shareholding company); a joint venture with Vietnamese investors; a contractual business co-operation arrangement; foreign contractor; a branch of an overseas company; or a representative office. It takes an average of 10 procedures and 34 days to establish a business in Vietnam.

A new law on commercial arbitration was passed by the National Assembly in June 2010 and came into effect in January 2011, replacing the previous 2003 law on commercial arbitration. The new law provides for extended scope of arbitration, applying for disputes arising from any commercial activities, as well as for increased flexibility in terms of governing law and the language of arbitration. While the law is expected to encourage the use of the country's arbitration system, it is still advisable to try resolving business disputes through negotiation in the first instance. If that fails, then arbitration will become necessary. Where investors are free to choose the forum for resolving disputes, it is important that contracts provide for suitable arbitration. Foreign investors will frequently deal with the Vietnam International Arbitration Centre (VIAC). The VIAC has jurisdiction over disputes arising from international economic relations. The VIAC has powers to enforce its awards. Vietnam is also party to the Convention on the Recognition and Enforcement of Foreign Arbitral Awards (New York, 1958).

While there has been progress with passing laws, implementation of the legal and judicial reforms has been frustrated by a traditionally opaque bureaucracy, endemic corruption and political interference. The key outstanding problem for investors in Vietnam, however, remains the gap between the existing laws and their enforcement and the difficulty in forecasting how government bureaucrats or judges will interpret and apply laws. Patience and negotiation are required to navigate the regulatory framework successfully.

(4) Tax Risk

The tax system in Vietnam is in a state of flux; its structure is complicated, lacks transparency and is subject to sporadic changes. Over the past few years, Vietnam has however made consistent efforts to improve its tax performance and reduced corporate tax rates, in the government's bid to modernize the tax system, to bring it more into line with its regional neighbors, and to satisfy criteria for Vietnam's entry to regional and international bodies, including the WTO in 2007. However, the number of changes—not to mention the lack of clarity in their application—has been a source of frustration for foreign investors. Foreign businesses are sometimes accused of tax-dodging, although this is due to the complex nature of the system than deliberate avoidance.

The standard corporate income tax rate stands at 25%. Vietnam has endorsed nearly 60 double-taxation agreements that may reduce the rates further or eliminate them altogether. The corporate tax rate for enterprises operating in the oil and gas industry vary between 32% and 50%, depending on the project, while preferential tax rates of either 10% or 20% are available for encouraged projects for specific periods. Profits earned within Vietnam and either transferred abroad or retained offshore are subject to a withholding tax. The tax is calculated on 3% of transferred profits for investors who contribute at least USD 10 million to the legal capital of an enterprise, 5% of transferred profits for legal capital of between USD 5 million and USD 10 million, and 7% for those contributing less than USD 5 million.

In May 2011, Prime Minister Nguyen Tan Dung approved a new tax reform strategy for 2011–2020 under which Hanoi will be gradually reducing corporate income tax. The proposed changes include: 30% corporate income reduction for small and medium-sized enterprises; income tax exemption for individuals earning the bottom level of the tax ladder; and tax exemption for stock dividends. The new strategy includes plans for simplification of tax procedures and putting in place tax policies that will spur investment particularly into supporting industries and the production of

high value-added products. The strategy also envisages an increase in domestic tax revenues up to 70% of the state budget by 2015.

(5) War Risk

Vietnam's principal adversary in the region has been China, with whom it fought a brief war in 1979. The primary dispute between the two sides is their conflicting claims to the Spratly and Paracel Islands in the South China Sea. China seized control of the Paracel Islands from Vietnam in 1974, while Vietnam controls the majority of the atolls in the Spratlys. Vietnam is very unlikely to initiate a naval skirmish with China over the Paracel or Spratly Islands by force, as this would almost certainly provoke a strong Chinese retaliation.

In June 2012, the China National Offshore Oil Corporation (CNOOC) offered nine blocks within the disputed areas in Vietnam and China's '9 dotted line' claimant zone. Vietnam formally protested and declared the blocks 'illegal'. The nine blocks overlap with existing Vietnamese oil blocks, which were already awarded to foreign companies, including ExxonMobil, Talisman and Vietgazprom. This is likely to lead to confrontations, such as ramming or obstruction, between exploration vessels and drilling vessels contracted by either China or Vietnam and their paramilitary escorts.

In November 2012, China's Hainan province, which contains the disputed South China Sea claimant area, amended its laws to allow maritime security forces (although not the Navy) the right to 'board, inspect, detain, eject, order a halt, a change of course, and to return course' any vessels deemed illegally infringing on the waters. The new law increases war risks in the South China Sea, but is only an incremental step by the Chinese rather than a significant escalation. Further escalation depends on the movement of CNOOC deep drilling vessels and the increased deployment of marine paramilitary vessels by the Chinese. However, it should be noted that both countries said in September 2012 that they would seek to solve the dispute through negotiation and dialogue.

(6) Terrorism Risk

Opposition groups are banned in Vietnam so most opposition and anti-Communist groups are headquartered outside the country, though they do not seriously threaten the government. Based in California, the 'Government of Free Vietnam' (GFVN) is a group of South Vietnamese anti-Communist former soldiers and bureaucrats. It has been implicated in attempted bombings in Vietnam and on Vietnamese government facilities elsewhere in Southeast Asia. The most serious attempted attack

by GFVN activists was in June 2001, when four members of the group threw an IED over the wall of the Vietnamese Embassy in Bangkok. However, GFVN activists are unlikely to be able to raise funds or access more sophisticated explosives to stage attacks in Vietnam.

Organized crime syndicates pose moderate extortion risks to businesses in major cities, including Ho Chi Minh City, Hanoi, Haiphong and Danang. In March 2013, police arrested a gang that extorted money from bus operators and their employees in Ho Chi Minh City. In June 2012, a gang member was convicted of threatening to kill a banker if he did not pay him USD 47,800 in Hanoi. Extortion gangs are likely to target employees of companies that do not comply with their demands in knife attacks.

There is an elevated risk of pirates stealing goods from anchored vessels off Vietnam's extensive coastline stretching along the South China Sea. Most incidents involve robbery and minor theft, mainly while ships were berthed at anchorages. There were only four such incidents in 2012 compared to eight in 2011. In February 2013, attackers boarded and stole stores from a container ship at anchor at Haiphong Anchorage before escaping. In November 2012, robbers boarded a chemical tanker and stole a fire wire at Nha Be Terminal in Ho Chi Minh City Port.

(7) Civil Unrest Risk

The fact that the Communist party retains tight control and faces few organized challenges has resulted in a low risk of large-scale political unrest. Where unrest does occur, it is likely to be localized and will most probably not affect foreigners. The government has traditionally maintained a long-standing policy of zero tolerance towards political dissent. Despite this, protests over land disputes are a moderate risk, but are now more likely to turn violent as protesters are increasingly using petrol bombs and throwing rocks during demonstrations. These are likely to take place in rural areas such as Ha Tinh province, where in August 2012 hundreds of villagers attacked and vandalized a government office in response to the arrest of a villager who resisted a land seizure. However, such protests will probably last for only a matter of hours as the government will probably use force to disperse crowds. In December 2012, rice farmers, protesting against land grabs, threw stones at police forcing them to disperse.

Disputes between Vietnam and China over a maritime boundary dispute in the South China Sea will probably lead to protests in Hanoi and Ho Chi Minh City, especially around the Chinese Embassy. In December 2012, 20 protesters staged an anti-China rally in Hanoi outside the Chinese Embassy. In March 2013, around 20 protesters rallied

in Hanoi to mark the anniversary of a naval battle with China. The risk to Chinese visitors is low, although some Chinese businesses in Hanoi and Ho Chi Minh City face moderate property risks during such protests.

Strikes tend to rise whenever inflation increases in Vietnam, as workers on relatively low wages have little ability to absorb increased living costs. Strikes are generally organized unofficially, given state control of unions. The state-controlled Vietnam General Confederation of Labor (VGCL) is the only legal union and all other unions are legally required to be VGCL affiliates. Moreover, in February 2008, the government enacted a decree that enables the prime minister to postpone or cancel strikes under a broad range of circumstances. Strikes are typically contained within a single factory and rarely turn violent. The government is likely to use force to end violent strikes. The actual number strikes are likely to be under-reported. Industrial action primarily affects foreign firms in low-end manufacturing such as garment factories, as they pay much lower salaries compared to state-owned enterprises. In January 2013, 2,000 workers at a Japanese-owned Nissey Vietnam factory went on strike to demand a higher yearly bonus in Ho Chi Minh. The risk of strikes has been reduced by the January 2013 increase in minimum wage.

(8) Infrastructure Risk

Vietnam's infrastructure is generally poor, but improving. The government is aware that the state of the country's infrastructure is impeding foreign investment, so resources are being targeted towards numerous development projects. Project implementation, however, delays have hindered the progress. Approximately 9% to 10% of the country's GDP is directed into infrastructure development and the state budget for transport infrastructure development projects is set to increase by 15% annually. In addition, government bonds and official development assistance are used as main capital sources for infrastructure development. The government is also keen to increase the private sector's investment in infrastructure development.

Air: Vietnam has three main airports handling 45 domestic and foreign airlines operating 55 international and 40 domestic routes: Hanoi (Noi Bai), Ho Chi Minh City (Tan Son Nhat), and Da Nang. The aviation sector has experienced significant growth in recent years, fuelled by the country's growing middle-class and an influx of foreign investment amid rapid growth. In 2009, Vietnam's airports handled over 26 million passengers and 445,800 tonnes of cargo, four times more than in 2000. The country's air-passenger traffic is forecast to increase between 12% and 14% to 85 million by 2020.

Road: There is a dense road network in Vietnam, but the infrastructure is itself very poor, with only 20% of the country's estimated 200,000km road network sealed. Secondary roads become virtually impassable in the rainy season and many rivers can only be crossed by ferry. Although 40% of freight traffic travels by road, this tends to be for short journeys only. The country's long lack of decent north-south road links particularly hinders economic growth. In recent years the Vietnamese government has invested heavily in upgrading and expanding the country's road network. In addition, the construction of bridges in the Mekong Delta, the upgrade of roads towards the Cambodian border, and, most importantly, the enhancement of Highway 1 – the main north-south road – will lead to improvements in the longer term. The government has said it plans to spend an estimated USD14 billion between 2010 and 2015 on 2,160km of new highway projects and major upgrades of existing roads. Toll-road concessions and build-operate-transfer (BOT) deals are also under consideration for the private sector and foreign investors.

Rail: The railway system, although 2,600km in length, is more suited for leisurely exploration than efficient transport. Trains are old and very slow, plying six main routes: Hanoi-Ho Chi Minh City, Hanoi-Haiphong, Hanoi-Muc Quan, Hanoi-Thanh Hoa, Hanoi-Lao Cai and Dong Anh-Thai Nguyen. In recent years, upgrade and expansion of the national rail network has been high on the government agenda. Upgrade plans involve renovating the main Hanoi-Ho Chi Minh City service, expanding the current network to include the isolated Central Highlands and Mekong Delta regions and construction of a rail link between Ho Chi Minh City and Phnom Penh, the final stretch of a planned rail link between Singapore and Kunming, China.

Maritime: Vietnam has 90 ports, the most important of them being at Hai Phong (in the northern part of the country), Ho Chi Minh City and Da Nang, which are run by the state-owned Vietnam National Shipping Lines (VINALINES). There are also five special ports for the shipment of oil and coal only. In 2009 Vietnam's ports handled more than five million 20-foot equivalent (TEU) container units. Port expansion has not kept up with increases in trade volume and congestion is an acute problem in the ports that are characterized by antiquated equipment and limited storage space. There are plans to invest more than USD10 billion in building new ports or expanding existing facilities in the decade up to 2020. How realistic this program is will depend on the government's ability to control inflation and modernize and reform other key sectors of the economy.

Waterways: The country has over 17,000km of waterways, more than 5,000km of which are navigable at all times. Waterways have traditionally played an important

role in the transportation of people and goods, and their usage is again increasing, although poor maintenance has had a negative impact on their operation.

Communications: Since Vietnam's accession to the WTO in early 2007, the telecom sector has been expanding fast and considerable progress has been made. By late 2010, Vietnam's General Statistics Office (GSO) reported that the country had 144.4 million telephone subscribers, a year-on-year (y/y) increase of 5.4%, of whom 34.5 million are mobile phone users. The total number of telephone users was 83.8 million (including 72.1 million mobile users) by late 2010. These figures point to the high level of access to multiple systems by a significant percentage of the population, and the maturity of the market. According to the GSO, more than 3.6 million people are internet users, a 20.7% y/y increase on the same 10-month period in 2009.

Utilities: While electricity output is rising, the authorities continue to struggle to match fast-growing demand for power, not least because much of the country's energy supply is exported. As a result, power cuts are frequent, and large parts of the country remain beyond the reach of the national grid. The government has recognized the need to boost foreign investment in the sector to increase capacity, diversify the country's reliance on hydropower, and counter a potential impending supply crisis. There are also serious problems with the quality of water. It therefore comes as little surprise that waterborne diseases are a significant health problem, accounting for between 20% and 30% of child mortalities. The government has, however, approved a plan to provide all urban centers with access to clean water supplies by 2020.