Department of Transportation and Communications (DOTC)

Data Collection Survey on Disaster-resilient Feeder Ports and Logistics Network in the Republic of the Philippines

Appendices

December 2015

Japan International Cooperation Agency (JICA)

The Overseas Coastal Area Development Institute of Japan

Oriental Consultants Global Co., Ltd.

Contents

1. List of the Ports in the Target Areas

1.1. Iloilo Province

N	Name of Port / Company	Location (Barangay, Municipality, City)	Name of Municipality	Name of Barangay
1	Carles	Carles	Carles	Poblacion
2	Estancia (PPA)	Estancia	Estancia	Poblacion (3 Barangays)
3	Batad	Binon-an, Batad	Batad	Binon-an
4	San Dionisio	San Dionisio	San Dionisio	Poblacion
5	Concepcion	Concepcion	Concepcion	Poblacion
6	Culasi (PPA)	Culasi, Ajuy	Ajuy	Culasi
7	Pantalan Nabaye	Pantalan Nabaye, Ajuy	Ajuy	Pantalan Nabaye
8	Barotac Viejo	Barotac Viejo	Barotac Viejo	Poblacion
9	Banate	Banate	Banate	Poblacion
10	San Salvador Breakwater	San Salvador, Banate	Banate	San Salvador
11	Santa Rita	Santa Rita, Anilao	Anilao	Santa Rita
12	Lamintao	Guintas, Barotac Nuevo	Barotac Nuevo	Guintas
13	Lanas Breakwater	Lanas, Barotac Nuevo	Barotac Nuevo	Lanas
14	Dumangas (PPA)	Dumangas	Dumangas	Poblacion (5 Barangays)
15	Bigke	Bigke, Leganes	Leganes	Bigke
16	Iloilo (PPA), Fish Port (PFDA)	Iloilo City	Iloilo City	Poblacion Molo
17	Tanza-Esperanza	Tanza-Esperanza, Iloilo City	Iloilo City	Tanza-Esperanza
18	Ortiz	Ortiz, Iloilo City	Iloilo City	Ortiz
19	Parola	Iloilo City	Iloilo City	
20	Muelle Loney Ferry Terminal	Muelle Loney-Montes, Iloilo City	Iloilo City	Muelle Loney-Montes
21	F.F. Cruz Shipping Corporation (River Wharf)	Bgy. Obrero, Iloilo City	Iloilo City	Obrero
22	Oton	Cabanbanan, Oton	Oton	Cabanbanan
23	Tigbauan	Buyu-an, Tigbauan	Tigbauan	Buyu-an
24	Guimbal	Guimbal	Guimbal	Poblacion (11 Barangays)
25	Miagao	Miagao	Miagao	Poblacion (7 Barangays)
26	Ajuy	Ajuy	Ajuy	
27	Estancia	Estancia	Estancia	
	Victorias Milling Co., Inc.	Bay-ang Ajuy, Iloilo City		
	Caltex (Phils.) Inc.	Culasi, Roxas City		
	Ayala Molasses Corporation	Lapaz, Iloilo City		
	Antonio Q. Ong	Punta, Tabuk, Roxas City		
	Pilipinas Shell Petroleum	Lapuz, La Paz, Iloilo City		
	B-V & Son Trading Inc.	Brgy. Libas, Roxas City		
	Bulkcem	Lapuz, Lapaz, Iloilo City		
	Petron Corporation	Barangay Obrero, Iloilo City		
	Pryce Gases, Inc. NC	Bo. Barrido, Ajuy, Iloilo		

Note: Prepared from DOTC's List and additional information in the survey
Port without number is private ports

1.2. Bohol Province

N	Name of Port / Company	Location (Barangay, Municipality, City)	Name of Municipality	Name of Barangay
1	Panglao	Panglao Island	Panglao	Poblacion
2	Panglao Municipal Port	Panglao Island	Panglao	Poblacion
3	Tagbilaran (PPA)	Tagbilaran City	Tagbilaran City	Poblacion (3 Barangays)
4	Manga	Manga, Tagbilaran City	Tagbilaran City	Manga

N	Name of Port / Company	Location (Barangay, Municipality, City)	Name of Municipality	Name of Barangay
5	Corte Quay	Cortes	Cortes	Poblacion
6	Maribojoc	Maribojoc	Maribojoc	Poblacion
7	Catagbacan (PPA)	Catagbacan, Loon	Loon	Catagbacan
8	Catagbacan Causeway/Wharf	Catagbacan, Loon	Loon	Catagbacan (Pob.)
9	Mocpoc	Mocpoc, Loon	Loon	Mocpoc (Pob.)
10	Napo	Napo, Loon	Loon	Napo (Pob.)
11	Moalong Fish Landing	Basac, Loon	Loon	Basac
12	Calape (Pangangan) Causeway	Calape	Calape	Calape (Pob.)
13	Tubigon (PPA)	Tubigon	Tubigon	Tubigon (Pob.)
14	Clarin	Clarin	Clarin	Clarin (Pob.)
15	Inabanga Causeway	Inabanga	Inabanga	Poblacion
16	Buenavista Causeway	Asinan, Buenavista	Buenavista	Asinan
17	Sta. Cruz	Sta. Cruz	Sierra Bullones	Sta. Cruz
18	Jetafe (PPA)	Jetafe	Jetafe	Poblacion
19	Jetafe	Jandayan, Jetafe	Jetafe	Jandayan (Pob)
20	Talibon (PPA)	Talibon	Talibon	Poblacion
21	Trinidad	Trinidad	Trinidad	Poblacion
22	Hingotanan (Islet)	Hingotanan, Bien Unido	Bien Unido	Hingotanan (East & West)
23	San Pedro	San Pedro, Bien Unido	Bien Unido	Puerto San Pedro
25	Ubay (PPA)	Ubay	Ubay	Poblacion
24	Tapal (Ubay)	Tapal, Ubay	Ubay	Tapal
26	Aguining	Aguining, Pres. Carlos Garcia, Lapining Is.	Pres. Carlos Garcia	Aguining
29	Pitogo	Pres. Carlos Garcia, Lapining Is.	Pres. Carlos Garcia	Poblacion
27	Popoo	Popoo, Pres. Carlos Garcia, Lapining Is.	Pres. Carlos Garcia	Popoo
28	Tugas	Tugas, Pres. Carlos Garcia, Lapining Is.	Pres. Carlos Garcia	Tugas
30	Baybayon	Baybayon, Mabini	Mabini	Baybayon
31	Candijay	Cogtong, Candijay	Candijay	Cogtong
32	Anda	Anda	Anda	Poblacion
33	Guindulman	Guindulman	Guindulman	Poblacion (2 Barangays)
34	Jagna (PPA)	Bunga Mar, Jagna	Jagna	Bunga Mar
35	Jagna	Jagna	Jagna	Poblacion (Pondol)
36	Valencia	Canmanico, Valencia	Valencia	Canmanico
37	Dimiao Causeway	Luyo, Dimiao	Dimiao	Luyo
38	Lila Causeway	Lila	Lila	Poblacion
39	Loay River Quay	Loay	Loay	Poblacion 2 Barangays)
40	Alburquerque Causeway	Alburquerque	Alburquerque	Poblacion (2 Barangays)
41	Baclayon Causeway	Baclayon	Baclayon	Poblacion
42	Duero	San Antonio, Duero	Duero	San Antonio (Pob.)
43	Millaga Wharf	Millaga		
44	Loon(PPA)	Loon	Loon	
45	Bien Unido	Bien Unido	Bien Unido	
	Philippine Sinter Corp.	Garcia Hernandez, Bohol		
	Tan Trade Corp.	Tagbilaran City		
	A.C. Mineral Dev't Corp.	Handayan Is., Jetafe, Bohol		
	Pilipinas Shell Petroleum Corp.	Tagbilaran City		
	Petron Corporation	Tagbilaran, Bohol		
	Balamban Concrete Aggregates and Construction Corporation	Bagacay, Talibon, Bohol		

Note: Prepared from DOTC's List and additional information in the survey
Port without number is private ports

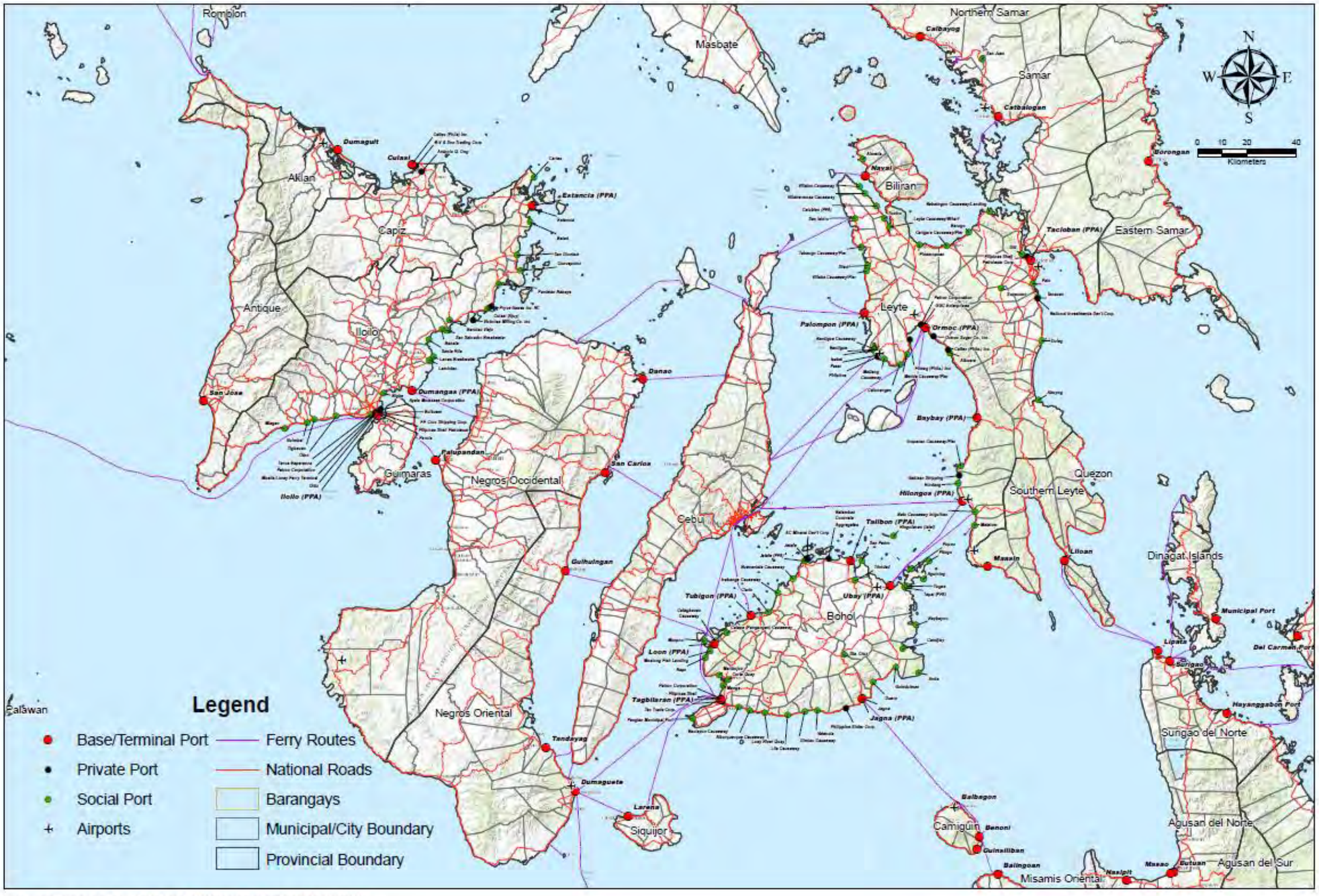
1.3. Leyte Province

N	Name of Port / Company	Location (Barangay, Municipality, City)	Name of Municipality	Name of Barangay
1	Calubian (PPA)	Calubian	Calubian	Poblacion
5	San Juan	San Juan, San Jorge	San Jorge	San Juan
2	Villahermosa Causeway	Villahermosa, Calubian	Calubian	Villahermosa
3	Villalon Causeway	Villalon, Calubian	Calubian	Villalon
4	Garganera	Garganera, Calubian	Calubian	Garganera
6	Toctoc	Toctoc, Leyte	Leyte	Toctoc
7	Leyte Causeway/Wharf	Leyte	Leyte	Poblacion
8	Pinamopoan	Pinamopoan, Capoocan	Capoocan	Pinamopoan
9	Barugo	Balud-Duka, Barugo	Barugo	Balud-Duka (2 Barangays)
10	Babatngon Causeway/Landing	Babatngon	Babatngon	Poblacion (4 Barangays)
11	Tacloban (PPA), (PFDA proposed)	Tacloban City	Tacloban City	Tacloban (Pob.)
12	Diit	Diit, Tacloban City	Tacloban City	Diit
13	Palo	Palo	Palo	Poblacion (6 Barangays)
14	Tanauan	Tanauan	Tanauan	Poblacion (6 Barangays)
15	Dulag	Canunzo, Dulag	Dulag	Poblacion (11 Barangays)
16	Abuyog Stair Landing	Abuyog	Abuyog	Poblacion (10 Barangays)
17	San Isidro	San Isidro	San Isidro	Poblacion (3 Barangays)
18	Tabango Causeway/Pier	Tabango	Tabango	Poblacion
19	Villaba Causeway/Pier	Fatima, Villaba	Villaba	Fatima (Pob.)
20	Silad	Silad, Villaba	Villaba	Silad
21	Palompon (PPA)	Palompon	Palompon	Poblacion (9 Barangays)
22	Bantigue	Bantigue, Isabel	Isabel	Bantigue
23	Bantigue Causeway	Bantigue, Isabel	Isabel	Bantigue
24	Matlang Causeway	Matlang, Isabel	Isabel	Matlang
25	Phil. Phosphate Fertilizer Corp.(Philphos, Phil. Isabel)	Isabel, Leyte	Isabel	Poblacion (2 Barangays)
26	Pingag	Isabel	Isabel	?
27	Calunangan	Calunangan, Merida	Merida	Calunangan
28	Merida Causeway/Pier	Merida	Merida	Poblacion
29	Ormoc (PPA)	Ormoc City	Ormoc City	Poblacion (29 Barangays)
30	Albuera	Albuera	Albuera	Poblacion
31	Baybay (PPA)	Baybay	Baybay	Poblacion (23 Barangays)
32	Inopacan Causeway/Pier	Inopacan	Inopacan	Poblacion
33	Hindang	Hindang	Hindang	Poblacion (2 Barangays)
34	Hilongos (PPA) → Hilongos	Hilongos	Hilongos	Poblacion (3 Barangays)
35	Bato Causeway, Iniguihan	Bato	Bato	Poblacion (5 Barangays)
36	Matalom	Matalom	Matalom	Poblacion (3 Barangays)
37	Carigara Causeway/Pier	Carigara	Carigara	Poblacion (5 Barangays)
38	Almeria	Poblacion		
39	Socsocon	Socsocon, Pastrana	Pastrana	Socsocon
40	Isabel	Isabel	Isabel	
	Ormoc Sugar Co., Inc.	Ipil, Ormoc City		
	Caltex (Phils.) Inc.	Ormoc City		
	Filmag (Phils.) Inc.	Canunzo, Merida, Northern		

N	Name of Port / Company	Location (Barangay, Municipality, City)	Name of Municipality	Name of Barangay
		Leyte		
	National Investments Dev't. Co.	Tanuan, Northern Leyte		
	Pilipinas Shell Petroleum Corp.	Anibong, Tacloban City		
	Pasar	Catiyoman Pt., Isabel, Leyte		
	Petron Corporation	Linao, Ormoc City		
	Gabisan Shipping	Bo. San Vicente, Hindang, Leyte	Hinang	Bo. San Vicente
	GGC Enterprises	Punta, Ormoc City	Ormoc City	Punta

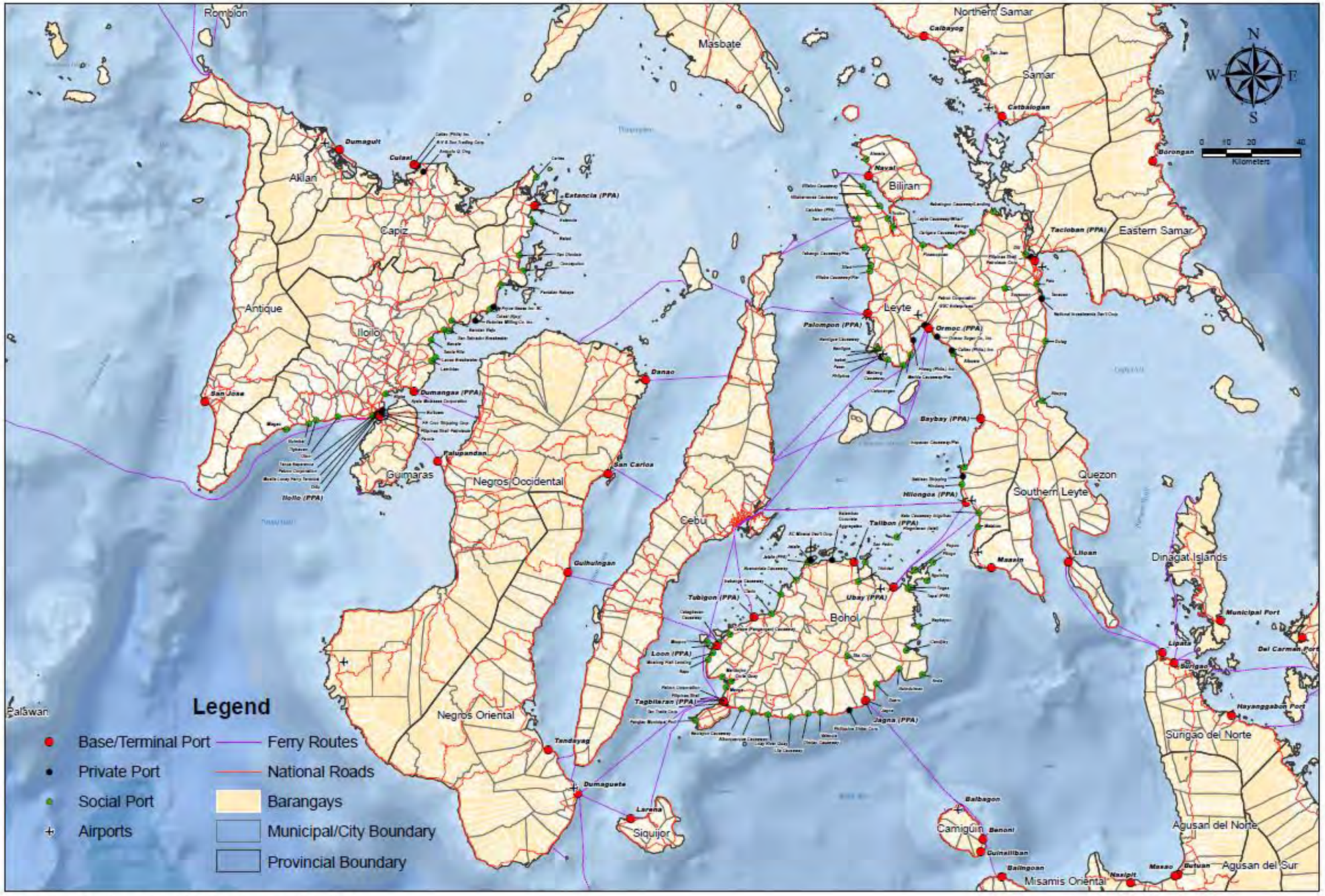
Note: Prepared from DOTC's List and additional information in the survey
Port without number is private ports

1.4. Topographic Map



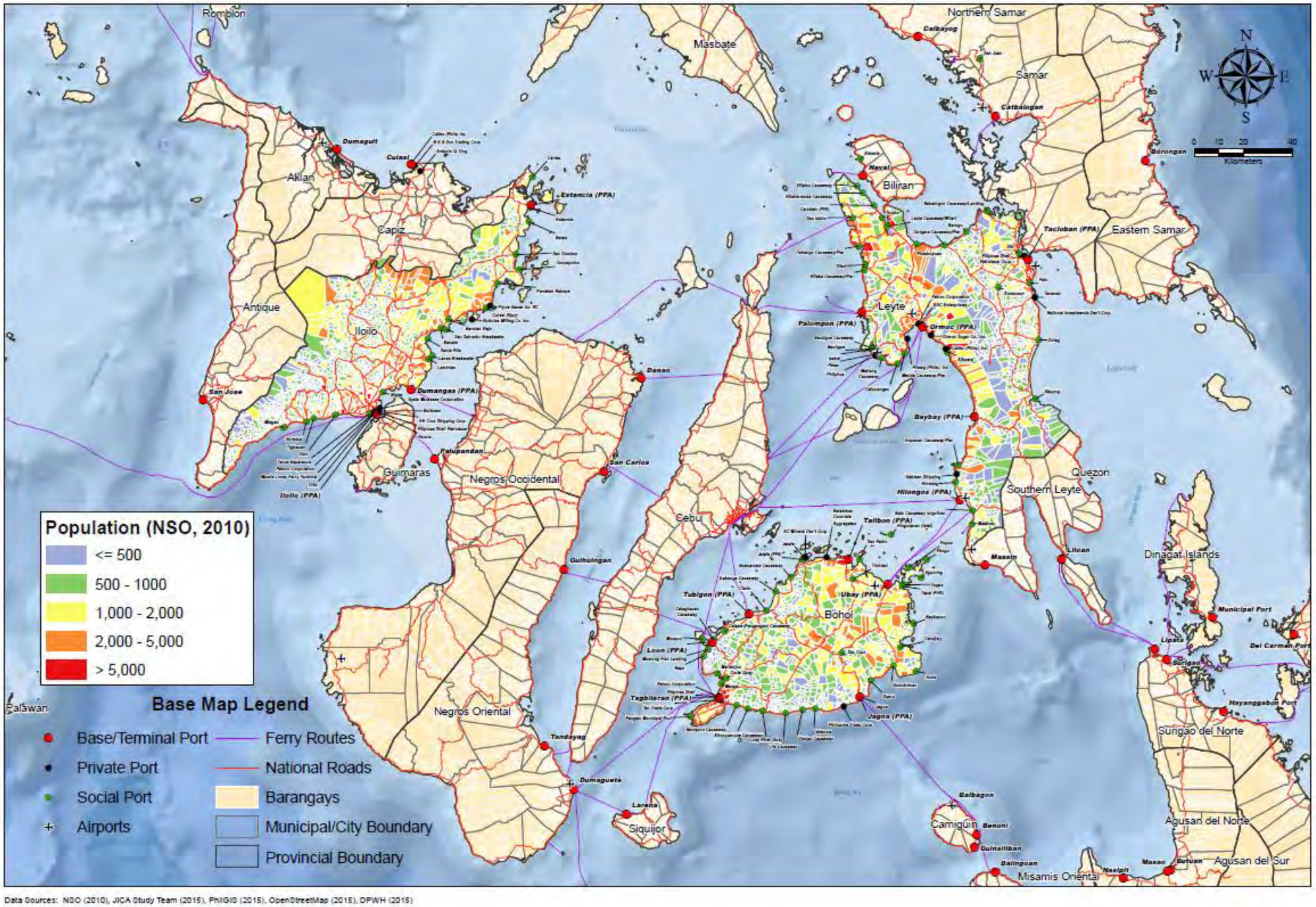
Data Sources: JICA Study Team (2015), PhilGIS (2015), OpenStreetMap (2015), DPWH (2015)
Note: Administrative boundaries are indicative.

1.5. Port Location Map



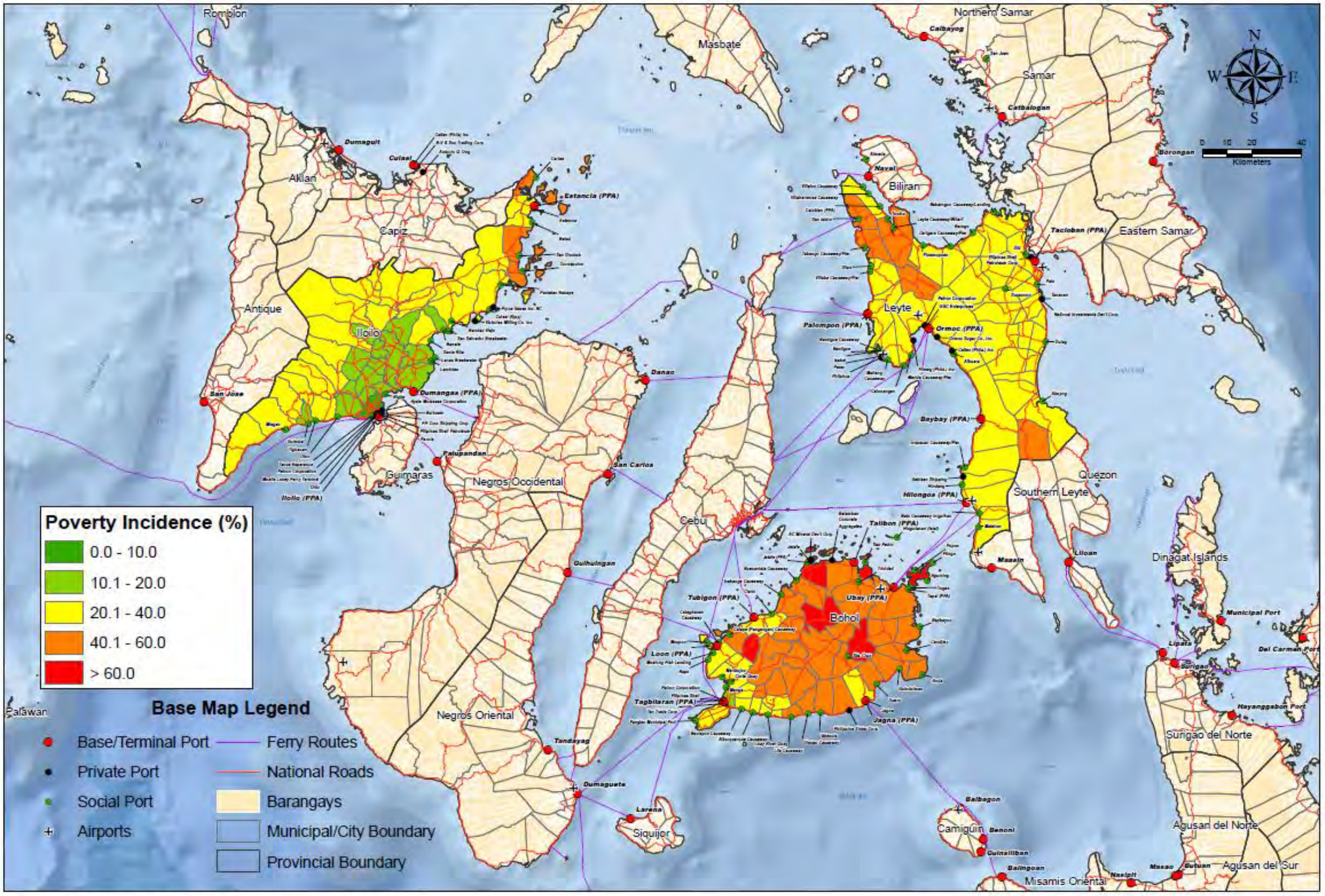
Data Sources: JICA Study Team (2015), PhilGIS (2015), OpenStreetMap (2015), DPWH (2015)
Note: Administrative boundaries are indicative.

1.6. Population Map



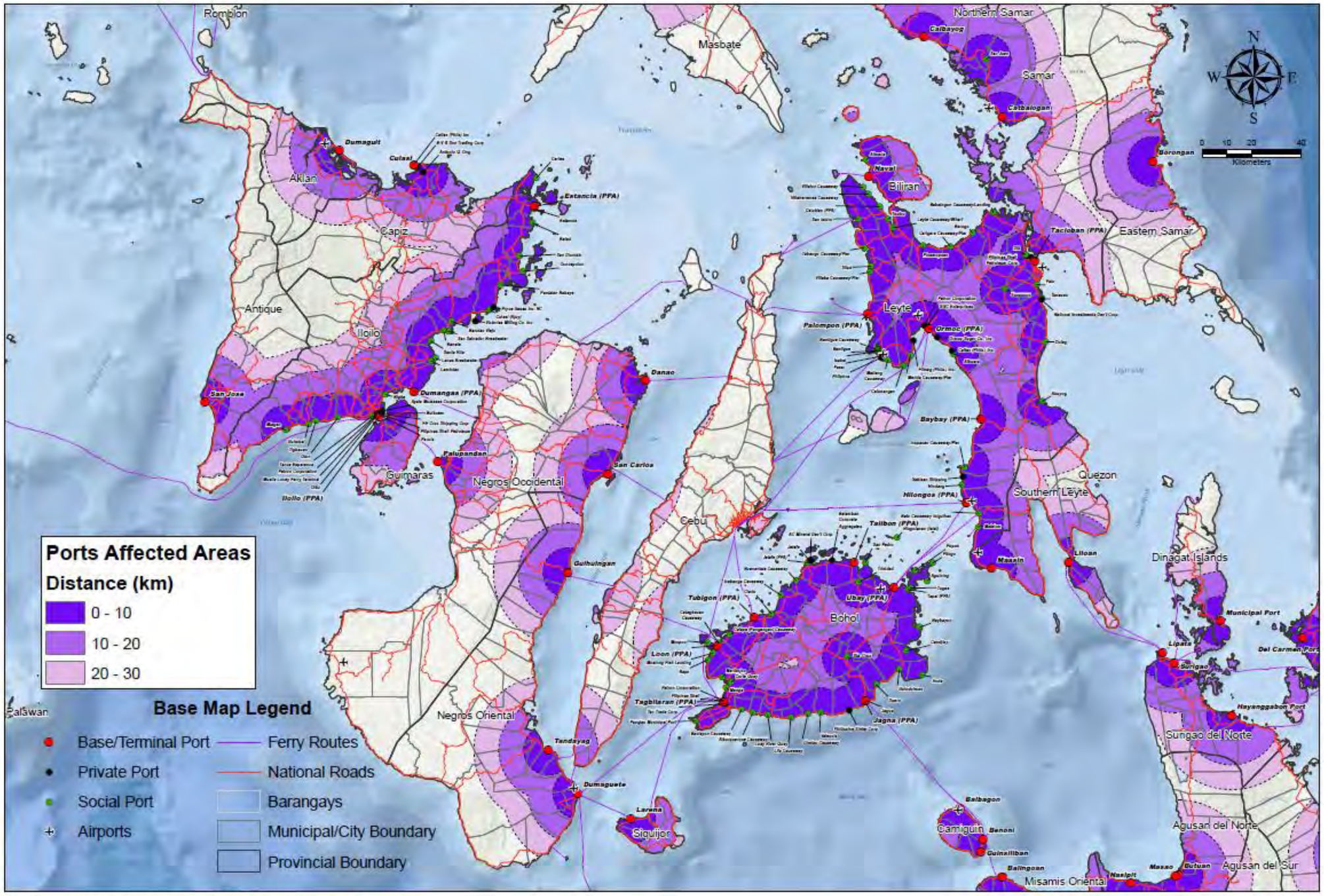
Data Sources: NSO (2010), JICA Study Team (2015), PhilGIS (2015), OpenStreetMap (2015), DPWH (2015)
Note: Administrative boundaries are indicative.

1.7. Poverty Map



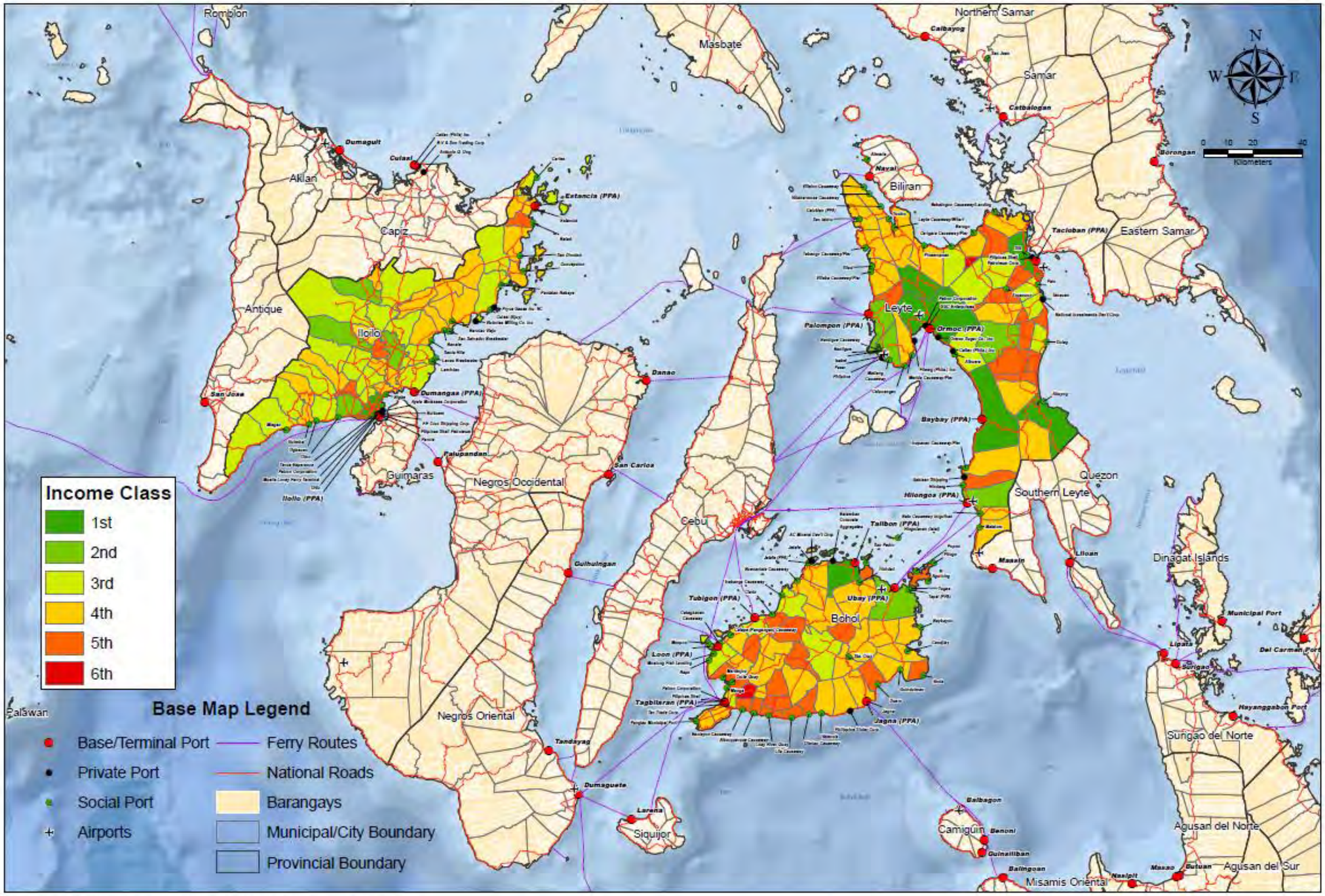
Data Sources: NSCB (2009), JICA Study Team (2015), PhilGIS (2015), OpenStreetMap (2015), DPWH (2015)
Note: Administrative boundaries are indicative.

1.8. Ports Affected Areas Map



Data Sources: NSCB (2009), JICA Study Team (2015), PhilGIS (2015), OpenStreetMap (2015), DPWH (2015)
Note: Administrative boundaries are indicative.

1.9. Income Class Map



Data Sources: DOF (2005), JICA Study Team (2015), PhilGIS (2015), OpenStreetMap (2015), DPWH (2015)
Note: Administrative boundaries are indicative.

2. Records of the Meetings

2.1. Explanation of Inception Report

(1) Minutes of the Meeting

Minutes of the meeting with:

DOTC, PPA, DILG, DBM, DOF, NEDA, PAGASA,

Date:	August 05, 2015.
Venue:	DOTC Headquarters 15/F Unit156 Columbia Tower Ortigas Avenue, Mandaluyong City 1555 Philippines
Purpose:	i. Explanation of Inception Report by the JICA Study Team
Participants:	See attached attendance sheet
Handout materials:	i. Inception Report ii. Presentation Paper iii. Questionnaire

The Study Team met with the representatives of DOTC, PPA and other partner agencies on August 5, 2015 at the DOTC Headquarters in Mandaluyong City, Philippines, at 09:30 am. The purpose of the meeting was to explain the inception report of the Study Team.

The presentation was conducted in accordance with the agenda as follows:
1. Opening Address by Mr. Enrico C. FERRE, Chief, Water Transport Planning Division of DOTC
2. Explanation of Inception Report by Mr. Tatsuyuki SHISHIDO, Team Leader of the JICA Study Team
3. Discussions/Open Forum

The following points have been discussed during the meeting:

- Mr. Amparo of PPA pointed out the corrections on the management body of the Ports of Popoo and Bato that are managed by the LGU and the spelling of Talibon Port
- Ms. Palapus of NEDA asked Mr. Shishido that 10 years have passed since the completion of the National Port Master Plan Study and the table showing the target ports was formulated in 2004 and it's possible that several ports might have been **developed already** since then up to this time.
- Mr. Shishido agreed with PPA and DOTC that some ports had been improved in the area. The Team will conduct a site visit and inspection of smaller ports other than the listed main ports in the target areas.
- Mr. Ferre of DOTC commented that the list of main ports in the target areas was prepared prior to their visit to the Philippines and in the preliminary stage of the study DOTC in coordination with PPA added **other potential ports** for their site visit.
- Mr. Shishido presented a list of small ports in the target area.
- Mr. Montano of DILG asked about the target areas for the Study. He pointed out the necessity of geographic isolation in time of disaster when selecting a target port and requested the Team to provide a rough sketch of possible **other feeder ports** and to check if some LGUs have such isolated ports. The ports listed are mostly managed by PPA and some are DOTC. Hence, some

LGU managed ports would better be added to have a better representation of how each port is managed by the respective agency and LGU.

- Mr. Shishido replied that the main ports were selected in view of logistics network. We would like to discuss about how to select a port in view of social welfare and we would appreciate if you could give us information especially about small ports.
- Ms. Penarroyo of JICA confirmed that the target list should contain **ports managed by PPA, DOTC and LGU**.
- Ms. Aserre of DOF asked whether this survey includes **private ports**.
- Mr. Shishido replied that private ports are also important because they can work with the government as part of the logistics network in time of disaster. But basically, the survey will **focus on public ports.**
- Mr. Shimizu of JICA mentioned that private ports can maintain and recover from disaster by themselves. But they can share their facility with the public upon necessity.
- Mr. Shishido also mentioned that based on the information gathered during the survey in Leyte, there is a private port which **PPA also monitors the activity** and that we could get data and facility information of the said port.
- Ms. Pagulayan of PAGASA asked whether there is an agreement between DOTC, PPA with the private ports and that the private port facility can be utilized in case ports facilities of PPA and DOTC are not available in time of disaster.
- Mr. Ferre of DOTC mentioned that in such a cooperation system a formal agreement between government (DOTC & PPA) and a private port owner can be recommended/entered into if necessary.
- Ms. Pagulayan of PAGASA suggested there are survey points of tide along coastal area so that data on tide is available.
- Ms. Pagtalunan of DOTC asked what about the **criteria** used by the Study Team for selecting the ports in the target areas.
- Mr. Shishido replied that the Team will analyze the criteria taking into consideration several study reports which have already been conducted. In second seminar or consultation meeting, we would like to discuss about the criteria we established at that time.
- **Dir. Mahinay of DBM** asked about the specific role of DBM for this project since the project is funded by JICA.
- Mr. Shishido commented that the Team will study what kind of **budgetary system** is suitable, not only disaster prevention management, but also recovery cost for damaged facilities. We need to clarify frameworks of several budgetary systems which are different in each department.
- **Mr. Shimizu of JICA** commented that the Study Team will introduce **standard design model** for disaster resilient port structures which may cause additional cost from current ordinary design. We would like to have a consultation meeting with DBM in order to **assess the budget** when DOTC prepare it for implementation of disaster-resilient port structure.

- Mr. Shishido added that the Team will make **standard design model** of disaster-resilient port structure and **estimate the cost** of it in order to compare with the cost of an ordinary one.
- **Ms. Pagulayan of PAGASA** suggested that the Team should take **storm surge** into consideration for deliberating standard design model of disaster-resilient port structures.
- Mr. Shishido replied that the Team is now conducting site survey in order to collect information about what damage was brought about, **not only storm surge**, but also other factors such as **strong wind and waves** due to typhoon.
- **Ms. Aserre of DOF** asked how many percentages of Feeder Ports were **turned over to LGU** from PPA.
- Mr. Ferre of DOTC replied that the operation and management of the feeder ports are mostly turned over to the LGUs.
- Ms. Penarroyo added that in the case of the JICA financed feeder ports, DOTC originally turned them over to LGUs for operation and maintenance (O&M). Further to that and due to sustainability issues in light of the capacity of LGUs to operate and maintain the ports, DOTC decided to turn over the feeder ports to PFDA or PPA by MOA, and then PFDA and PPA are later expected to turn over O&M to LGUs.
- Mr. Ferre of DOTC replied that 61 feeder ports were implemented by JICA, 27 feeder ports project under Package 1 and 34 feeder ports constructed under Package 2. There were 9 feeder ports under the JICA project that were turned over to PFDA through a Memorandum of Agreement with the LGUs.
- **Ms. Aserre of DOF** asked which agency will take responsibility for the port management in case the LGU is not capable of maintaining it.
- Mr. Ferre of DOTC replied that the LGU requests for **financial assistance from PPA or DOTC** in such a case.
- Ms. Penarroyo of JICA asked whether PPA extended financial support to these ports
- Mr. Amparo of PPA replied that some instances PPA supported them for assistance.
- Mr. Ferre of DOTC mentioned that DOTC also supported some LGUs for port development. The MOA covering the implementation of the 47 feeder ports in 2015 was already signed by DOTC secretary and PPA. The budget allocated is from the national government under the municipal ports development program.
- Mr. Amparo of PPA mentioned that its cost is about 1.083billion for 2015.
- Ms. Penarroyo of JICA asked whether the ports to be implemented by the budget are **new construction or rehabilitation** because some of the ports may have been constructed by JICA fund before.
- Mr. Ferre of DOTC replied that it is a mix of both. Most of the ports that are existing are for rehabilitation but some are for new construction. For example, Estancia port in Iloilo was constructed by JICA but it requires fund for rehabilitation by DOTC 2015 budget.

- Mr. Shishido mentioned that the Team will prepare and gather information about the ports which were constructed,managed or turned over and maintained.
- Mr. Montano of DILG requested for confirmation regarding the 17 August seminar.
- Mr. Shishido replied that the seminar on 17 August which covers technical matters will be held for the personnel of DOTC and PPA. We will invite other relevant agencies for consultation meetings to be held in the middle of September and middle of November for the presentation of the result of the Study and Draft Final Report.
- Mr. Montano of DILG asked whether the other agencies need to prepare or make commitments at the meeting.
- Mr. Shishido replied that the Team would like to visit the offices of relevant agencies in order to discuss about the information we need by using not only the questionnaire, but also other queries and discussion.
- Mr. Ferre of DOTC requested the participants to welcome and assist the Study Team in case they intend to visit the other agency for a meeting/discussion.

The meeting adjourned at 11:00 am.

ENRICO C. FERRE
Division Chief, Water Transport Planning Division
Department of Transportation & Communications

Tatsuyuki SHISHIDO
JICA study team leader,
Data Collection Survey on Disaster-resilient Feeder Ports and Logistics Network in the Republic of the Philippines

(2) Attendance Sheet

Attendance Sheet

Venue: 15/F Unit156 Columbia Tower Ortigas Avenue, Mandaluyong City 1555 Philippines

Date: August 5, 2015

No.	Name	Organization/ Department	Position/ Title
1	Corina Alcantara	DOTC	Project Development Officer
2	Paul Irineo P. Montano	DILG	Local Government Operations Officer IV
3	Patricio Amparo	PPA	Principal Engineer. C
4	Leah Penarroyo	JICA	Sr. Program Officer
5	Toshihiro Shimizu	JICA	Project Formulation Advisor
6	Cita Mahinay	DBM	Director IV
7	Hazel Palapus	NEDA	Sr. Economic Development Specialist
8	Enrico C. FERRE	DOTC	Chief Transportation Development Officer
9	Pagulayan ROSALIE	PAGASA	Weather Specialist 2
10	Ms. Lourdes T. Pagtalunan	DOTC	Sr. Communication Development Officer
11	Maria Carmelita L. QUIJANO	PPA	Supervising Economist
12	Dolly ASERRE	DOF	Financial Analyst
13	Homer T. DELA PAZ	DOTC	Supervising Transportation Development Officer
14	Andy URSOLINO	DBM	Supervising Budget and Management Specialist
15			

(3) Presentation Materials

Department of Transportation and Communications (DOTC)

Japan International Cooperation Agency (JICA)

Data Collection Survey on Disaster-resilient Feeder Ports and Logistics Network in the Republic of the Philippines

Inception Report

5 AUG. 2015

The Overseas Coastal Area Development Institute of Japan (OCDI)
Oriental Consultants Global (ORG)

JICA Study team

The Overseas Coastal Area Development Institute of Japan (OCDI)
Oriental Consultants Global (OCG)

Mr. Tatsuyuki SHISHIDO (OCDI)
Team Leader/Port Disaster Prevention Policy
Mr. Takashi SHIMADA (OCDI)
Port Disaster Management Planning (1)
Mr. Ken SAITO (OCDI)
Port Disaster Management Planning (2)
Mr. Isao HINO (OCG)
Port Design (1)
Mr. Masaaki GOSHIMA (OCG)
Port Design (2)
Mr. Hiroki KOHNO (OCDI)
Assistance for Port Disaster Prevention Policy /Operational Coordination

Background of the Project (Disaster Management)

Disaster management system has been established under the act of DRRMS in 2010

Legal Framework/Policy

DRRMA (Disaster Risk Reduction and Management Act) (2010.5.27)

NDRRMF (National Disaster Risk Reduction and Management Framework) (2011.6)

NDRRMP (National Disaster Risk Reduction Management Plan)

Organizational Framework

NDRRMC (National Disaster Risk Reduction Management Council)

OCD (secretariat)
DND (Chairman)
DOST (Vice Chairman)
NEDA, DSWD, DILG, DOTC, DOF, DBM, DPWH
PAGASA, PHIVILC
PCG, LGU, RPMA
PPA, CPA

Local Disaster Risk Reduction Management Council

Background of the Project (Role of Ports)

Forming Logistics Networks in disasters is important for supplying emergency goods to suffered area and implementing restoration works as well as making the life in damaged area to come back to a normal one.

Ports are required to provide necessary services intermediate after a disaster and in restoration stage under an appropriate port management and coordination with relevant agencies/entities.

Responsible Body for port management

Small regional ports
Department of Transport and Communications (DOTC) and LGU

Large or medium size ports:
Philippine Ports Authority (PPA), Cebu Ports Authority (CPA), the Subic Bay Metropolitan Authority (SBMA), the Bases Conversion and Development Authority (BCDA), the Cagayan Economic Zone Authority (CEZA), the Regional Port Management Authority (RPMA)

Purpose of the Project

Aims to support the Government of the Philippines to enhance the disaster resilience in the country in the areas of feeder ports as well as the feeder ports' network development which will lead to the economic and social development in the country.

Guidelines for prioritizing Standard design Model

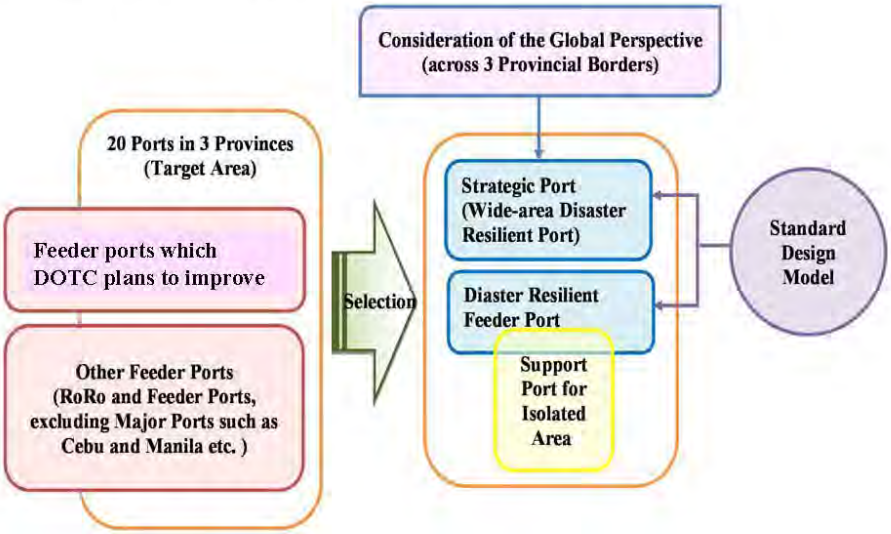
Creation of a port network to maintain effective logistics in time of disaster

Proposal on port design with disaster preventive functions

Target area

Bohol Province, Iloilo Province and Leyte Province in Visayas

Category of Ports



Main Ports in Target Area

Province of Iloilo		Province of Bohol		Province of Leyte	
Iloilo	PPA	Tagbilaran	PPA	Tacloban	PPA
Dumangas	PPA	Loon	PPA	Calubian	PPA
Ajuy	LGU	Tubigon	PPA	Palompon	PPA
Estancia	PPA	Clarin	DOTC	Isabel	PPA
		Jetafe	PPA	Ormoc	PPA
		Tahibon	PPA	Baybay	PPA
		Ubay	PPA	Hilongos	PPA
		Popoo	PPA	Bato	Private

Source: The Study on the Master Plan for the Strategic Development of The National Port System in the Philippines (Jan. 2004, JICA) etc.

Types of Disaster

Typhoon*	Earthquake*
Typhoon Yolanda (refer to the wind speed in Typhoon Yolanda)	Bohol Earthquake (refer to the PPA's design guideline formulated in 1995 (through support of JICA expert) which is applied in the current planning)

*winds (and storm surge) caused by typhoons, and tsunamis caused by earthquakes shall be considered in formulating the model

Collecting information and analysis in Japan

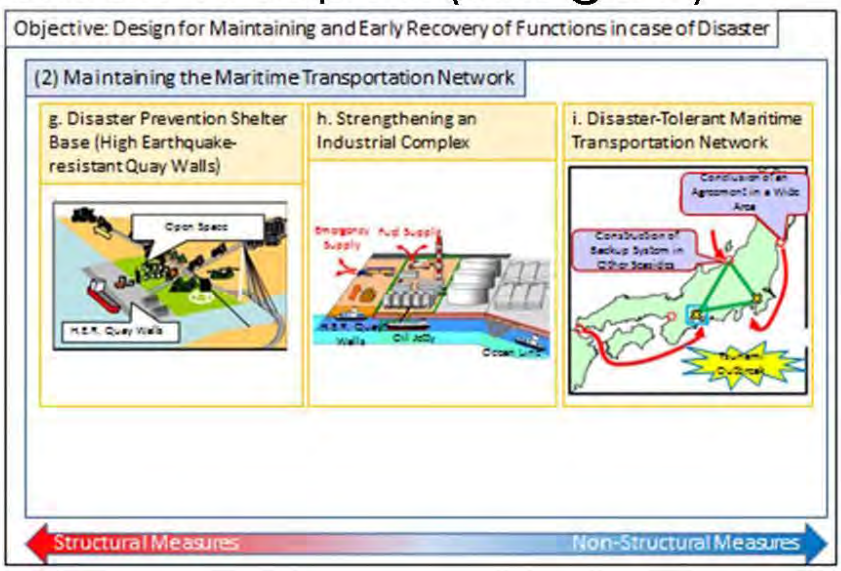
- Disaster prevention plans of the Government of the Philippines
- Basic policy and issues related to feeder ports and other infrastructures by the Government of the Philippines
- Statistics of strategic ports and feeder ports in the Philippines
- Previous JICA studies
- Reports other partners/private entities

Japanese technology and Prevention Measures to Ports

Documents published by the MLIT
Basic Guideline for Countermeasure Facilities against Large-Scale Earthquakes (Dec. 1996)
Manual for Disaster Prevention Inspections in Coastal Areas (Mar. 1997)
Proposal for Disaster Prevention at Ports and Harbors (July 2003)
Guideline for Ports Having High Resistance against Earthquakes (Mar. 2005)
Guideline for Countermeasures against Earthquakes and Tsunamis (June 2012)
Guideline for Port Business Continuity Plan (BCP) (Mar. 2014)
Documents published by Local Governments
Basic Guideline for Countermeasures against Large-Scale Earthquakes at Ports and Fishing Harbors (Nagasaki, Mar. 2006)
Disaster Prevention Plan in Tokyo Remote Islands Region (Tokyo, Mar. 2015)
Port Design Manuals for High Resistance against Disasters
Disaster Prevention / Mitigation and Projects for Ports and Harbors Restoration
Action Plan for National Resilience 2014

Disaster Prevention at Ports and Harbors in Japan (Image-1)

Disaster Prevention at Ports and Harbors in Japan (Image-2)



Collecting information and analysis in the Philippines

- Policy and plans by DOTC
- Review of past studies
- Analysis on disaster prevention and logistics network in time of disaster
- Standards for disaster resilient facilities

We plan to visit relevant agencies for collecting information/data

Site Survey

Leyte Province
Ports of Tacloban, Palompon, Isabel, Ormoc, Baybay, Hindang, Babatngon and surrounding areas

Bohol Province
Ports of Tagbilaran, Popoo, Ubay, Getafe, Tubigon, Guindulman, Dimiao and surrounding areas

Iloilo Province
Ports of Iloilo, Estancia, Dumangas and surrounding areas

Visiting Office
Local Offices of DOTC and PPA, Provincial Offices, and City or Municipality Offices

Collecting and analyzing Information for preparing Guidelines

-Port traffic data (passenger, cargo volume)
-Vessel characteristics currently operating, if any
-Commodities handled
-Vessel trips and schedules, Fares
-Linkages to other municipal ports
-Common problems encountered in the port, if any
-Operation and management of the port
-Location and proximity to other LGU/PPA or private ports
-Conditions of roads (port access road, municipal, provincial)
-Environmental and social issues, if any
-Areas isolated from social services
-Disaster issues etc.

Preparing Selection standards

Disaster Resilient Feeder Ports (tentative)

Physical Conditions of the Port	Water Depth, Berth Length, Entry and Departure conditions, Mooring Facilities, Handling Cargo, Embarking and Disembarking, Open at Night, Open Space and Shed, Optional Function of the Disaster prevention, Frequency of Disasters
Regional Conditions around the Port	Road Accessibility, Situation of Land Use, Vulnerability to Disasters, Population and Industrial Clusters
Network Conditions	Maritime Network in Normal Times, Alternative Use of the Port, Land Transport Network in the Hinterland, the Location of Local Government

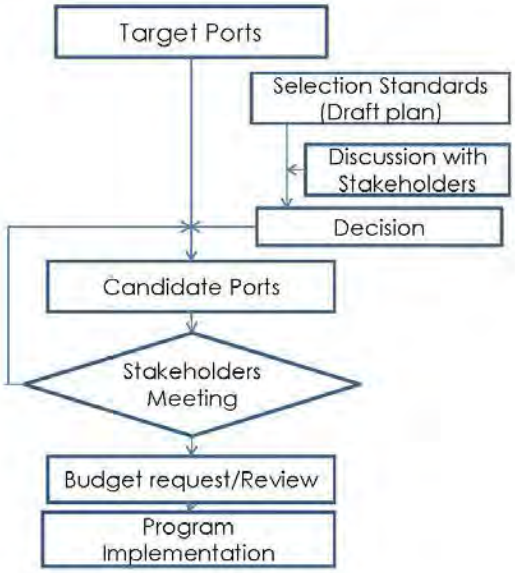
Preparing Selection standards

Ports which support people in Isolated Areas (tentative)

Physical Conditions of the Port	Port Facility, Difficulty of Port Improvement, Frequency of Disasters
Regional Conditions around the Port	Road Accessibility, Situation of Land Use, Vulnerability to Disasters, Population and Industrial Clusters around the Port
Network Conditions	Distance from Liner Service Ports, Land Transport Network in the Hinterland, Population and Economic Activity in the Hinterland, Difficulty of Accessibility to School, Hospital, Administrative Organ and Retail Facilities

Formulating guidelines

- Disaster resilient feeder ports
- Ports for providing social services for people in isolated areas



Assessment of the Current Status of Ports and Related Facilities

Collection of Basic Port Information

Overview of facilities
Design conditions
Structural calculation sheet
As-built drawing
Record of inspection and repair
Results of visual inspection

Evaluation criteria

Design criteria, standards and actual conditions of the port structures for seismic intensity, wave height or wave pressure and tide datum level

Standard Design Model of Disaster Resilient Port facilities

Structures (Sample)

Quay

Pier Type Structure/Concrete Block Type (Gravity Type) Structure

Administration Building, Waiting room, Warehouse

Standard design model (Sample)

-Hazards Mapping and Assessment for Effective community-based disaster Risk Management (READY Project)

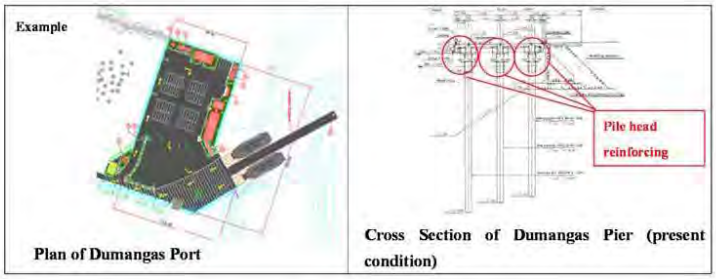
-Design Manual for Port and Harbor Facilities by PPA

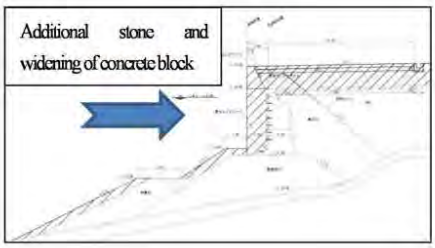
-Standards by MLIT Japan

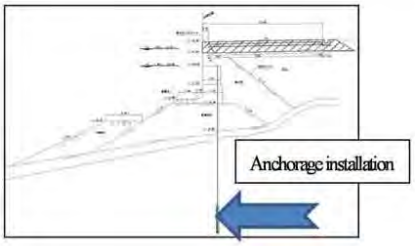
Cost Estimation

Additional Cost, Construction Cost

Sample of Structure







Other subjects

Organizational framework and planning process, Proposal for enhancing ownership

Budgetary System regarding disaster reduction management

Seminar/Meeting

Seminar

(DOTC, PPA)

1st Seminar: Mid-August

-Japanese experience on disaster management of the port sector

-Findings in the site survey

2nd Seminar: late September

-Technical matters in DFR

Consultation meeting

(DOTC,PPA,LGU, relevant ministries/agencies)

Midterm Reporting: Mid-September

-Findings at a midterm stage

Workshop: Mid-November

-DFR

Reporting

ICR: 5 Aug. 2015
Explanation at a meeting

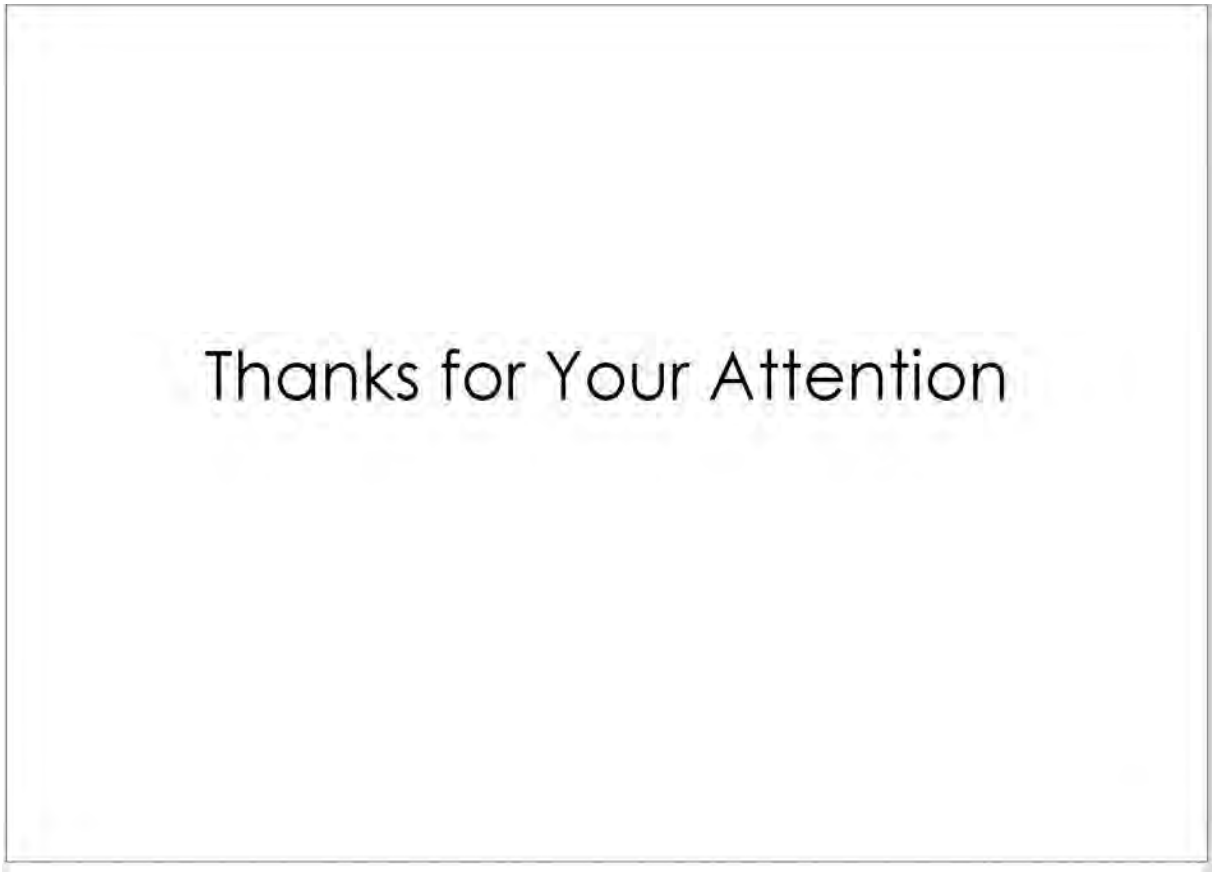
DFR: Mid-November 2015
Explanation at a meeting

<comments within 2 weeks>

FR : January 2016
Sending by JICA

Assignment of Experts

Responsibility	Name	2015 Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Team Leader/Port Disaster Prevention Policy	Mr. Tatsuyuki SHISHIDO		30		30		15	
Port Disaster Management Planning (1)	Mr. Takashi SHIMADA				25		15	
Port Disaster Management Planning (2)	Mr. Ken SAITO		30		20		15	
Port Design (1)	Mr. Isao HINO		12		20		14	
Port Design (2)	Mr. Masaaki GOSHIMA		28					
Assistance for Port Disaster Prevention Policy/ Operational Coordination	Mr. Hiroki KOHNO		30				15	


Thanks for Your Attention

2.2. 1st Seminar

(1) Minutes of the Meeting

Minutes of the meeting with:

DOTC, PPA, JICA,

Date: August 17, 2015.

Venue: DOTC Headquarters
15/F Unit156 Columbia Tower Ortigas Avenue, Mandaluyong City 1555 Philippines

Purpose:
i. Explanation of Naturral disasters and ports in Japan
ii. Introduction of Disaster Management Policy of the port sector in Japan
iii. Explanation of Field Survey Results

Participants: See attached attendance sheet

Handout materials:
i. Agenda
ii. Presentation Papers

The Study Team met with the representatives of DOTC, PPA and JICA on August 17, 2015 at the DOTC Headquarters in Mandaluyong City, Philippines, at 14:00. The purpose of the meeting was to explain and introduce following topics in accordance with the following agenda:

Agenda	
1. Opening Remarks	DOTC
2. Natural Disasters and Ports in Japan	JICA study team
3. Disaster Management Policy of the Port Sector in Japan	JICA study team
4. Field Survey Results (Ports in Leyte, Bohol and Iloilo Provinces)	JICA study team
5. Closing Remarks	DOTC

The meeting adjourned at 16:00 am.

(2) Attendance Sheet

Attendance Sheet

Venue: 16/F Unit167 Columbia Tower Ortigas Avenue, Mandaluyong City 1555 Philippines

Date: August 17, 2015

No.	Name	Organization/ Department	Position/ Title
1	REANTO YUMANG	PPA	Municipal Engineer
2	GLENN S. LAGUNAY	PPA	Manager, PSD
3	MARCELO C INDIC	PPA	Manager, ESD
4	ANTONIO F. BELARGA	PPA	Manager, ESD
5	ROSENDA S. SUMAGAYSAY	PPA	Port Manager
6	RODEL G. LAGNAY	PPA	Aging TS
7	ANNIE LEE F. MANESE	PPA PMO BOHOL	Port Manager
8	RICHARD S. ELOPRE	PPA PMO BOHOL	ESD Manager
9	JULIUS A. JUMANGIT	PPA PMO BOHOL	Division Manager
10	BERNARD C. GALLEDO	PPA ORMOC	Division Manager
11	MANUEL A. BOHOLANO	PPA ORMOC	Port Manager
12	GERRY D. LIQUIDO	PPA ORMOC	Division Manager
13	TOSHIHIRO SHIMIZU	JICA	Project Formulation Advisor
14	HAYATO NAKAMURA	JICA	PFA on DRRM
15	YUJI SANA	JICA	Country Officer

Attendance Sheet

Venue: 16/F Unit167 Columbia Tower Ortigas Avenue, Mandaluyong City 1555 Philippines

Date: August 17, 2015

No.	Name	Organization/ Department	Position/ Title
16	FLORO ADVIENTO	JICA	Program Manager
17	JENNELIZA DL. REBONG	PPA - HO	Actg. Port Operations, Chief, TPRS, TSD, POSD
18	REY T. DEL MORO Jr.	PPA	Division Manager,Terminal Services, POSD
19	DANTE A. LULU	PMS	
20	MYRA B. MEDINA	WTPD	
21	FRANCISCO O. TAMPUS	WTPD	
22	MENCHIE BOGNALOC	WTPD	
23	ERNESTO CRUZ	SVTI	
24	DENNIS M. ALBANO	WTPD - DOTC	Spvg. TDO
25	HOMER T. DELA PAZ	WTPD - DOTC	Spvg. TDO
26	RAUL HHIGASHIONNA	Oriental Co.	Civil Engineer
27	EMMA P. RIVERO	WTPD - DOTC	STDO
28	FLORENCIO DELA CRUZ	PMS	PM
29	ABELARDO D. SORE Jr.	DOTC - PMS	PM
30	RAMIR S. LAURENCE	PMO LADP	Compprog III

Attendance Sheet

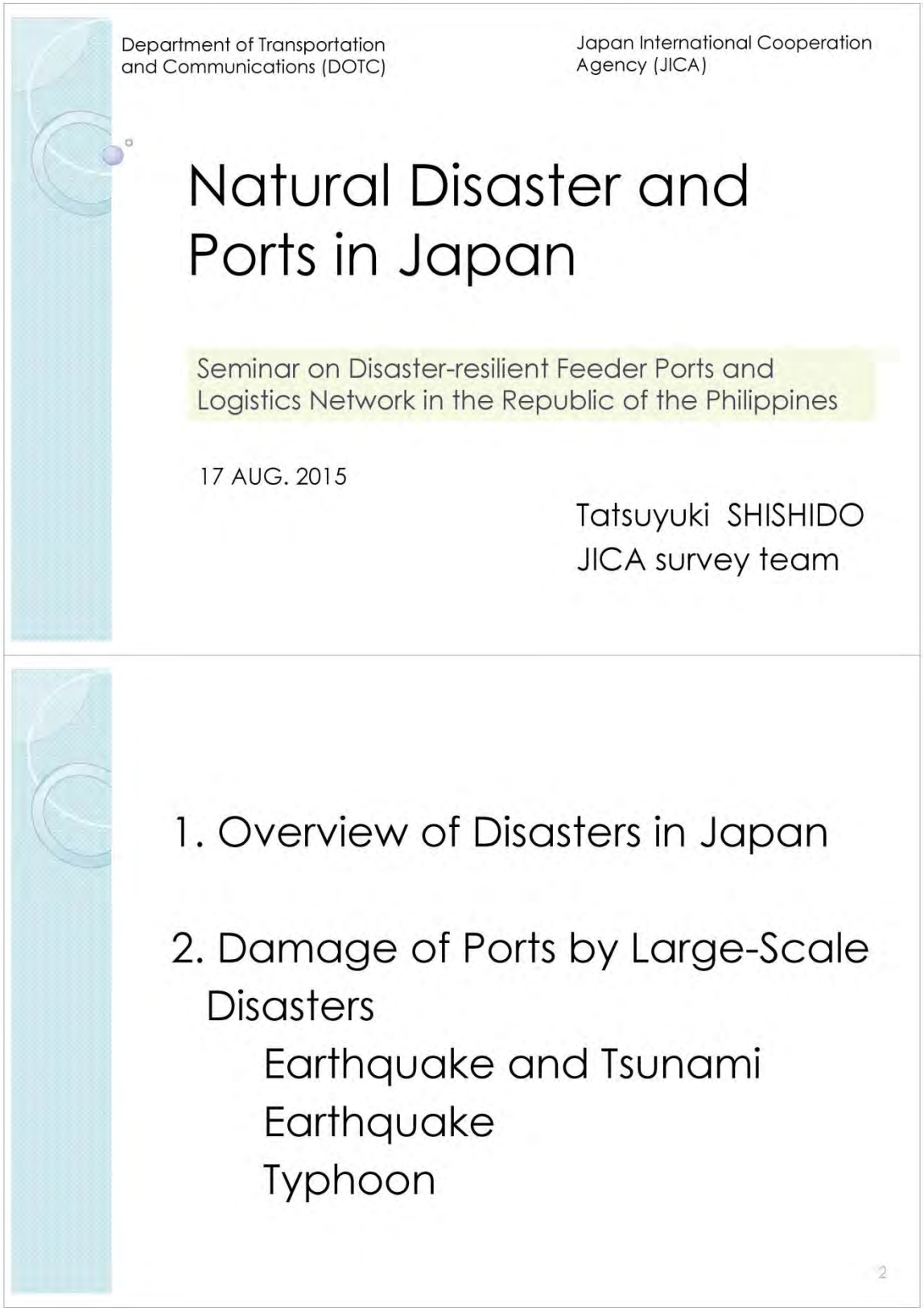
Venue: 16/F Unit167 Columbia Tower Ortigas Avenue, Mandaluyong City 1555 Philippines

Date: August 17, 2015

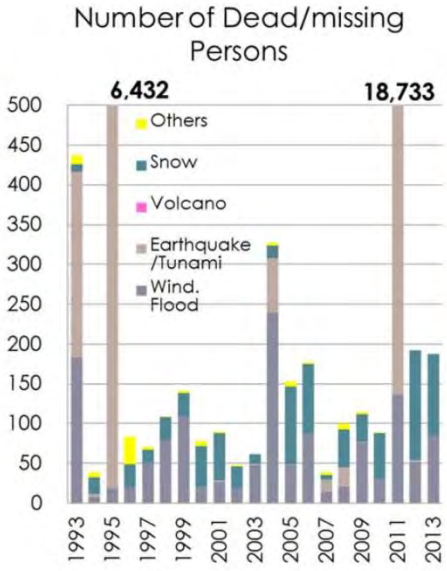
No.	Name	Organization/ Department	Position/ Title
31	CELESTE RAMOS	DOTC - PDS	Engineer III
32	CHRISTOPHER FLOYD QUERIJERO	DOTC - PDS	Engineer I
33	JOHN ED V. VILLASIS	DOTC - PDS	Engineer II
34	ALEXANDER B. FELIX	DOTC - PMS	Engineer III
35	John Paul V. Villasques	DOTC - PMS	PEO - II
36	MANNY LARDIZABAL	WTPD - DOTC	Sr CDO
37	KEN SAITO	JICA TEAM	Engineer
38	MASAAKI GOSHIMA	JICA TEAM	Engineer
39	ISAO HINO	JICA TEAM	Engineer
40	CORINA ISABEL ALCANTARA	DOTC- Office of the Undersecretary for Planning	Project Development Officer
41	SUZANNE TORRES	JICA TEAM	Secretary
42	HIROKI KOHNO	JICA TEAM	Engineer
43			
44			
45			

(3) Presentation Materials

1) Natural Disasters and Ports in Japan



Disasters in Japan



Prepared from White Paper Disaster Management 2014

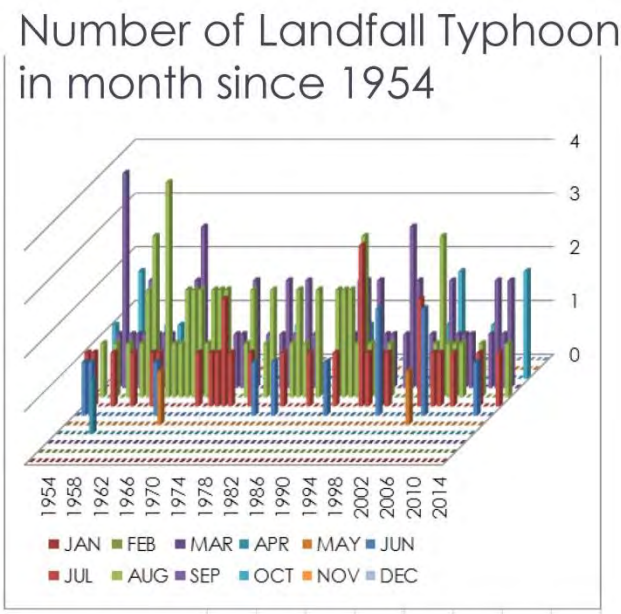
Geospatial Information Authority of Japan

3

Typhoon

182 typhoons from 1954 to 2014

3-4 typhoons make landfall in a year.



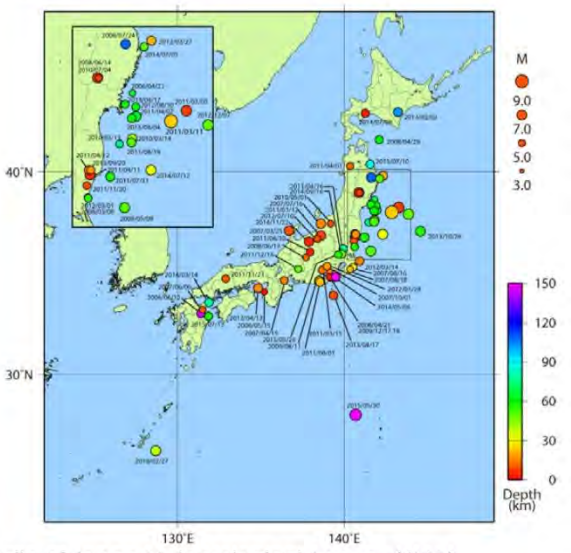
Number in a year	0	1	2	3	4	5	6	10
Occurrence	4	7	17	18	10	5	2	1

Prepared from website of Japan Meteorological Agency (JMA)

4

Earthquake

Damaging Earthquakes which Involve human suffering since 2006 to 2015



website of Japan Meteorological Agency (JMA)

Occurred in Japan from 2006 to 2015

Magnitude	Occurrence
4.0-4.9	7
5.0-5.9	27
6.0-6.9	21
7.0-7.9	9
8.0-8.9	1
9.0-	1
Total	**66**

5

Tsunami attacked Japan after Meiji Era

Earthquake	year	Magnitude	Maximum Height	Dead/missing person	Arrival Time
Perigean Tsunami					
Meiji-Sanriku Earthquake	1896	8.2	38.20	21,959	-
Syowa-Sanriku Earthquake	1933	8.2	28.70	3,064	-
Tonankai Earthquake	1944	7.9	9.00	1,223	-
Nankai Earthquake	1946	8.0	6.50	1,330	-
Nihonkai-Chubu Earthquake	1983	7.7	13.00	104	-
Hokkaido Nanseioki Earthquake	1993	7.8	31.70	202	-
Great East Japan Earthquake	2011	9.0	26.00	21,839	-
Apogean Tsunami					
Atacama Earthquake	1922	8.3	0.70		
Kamchatka Earthquake	1952	8.5	1.00		
Chili Earthquake	1960	9.5	6.10	142	22h30m
Alaska Earthquake	1964	9.2	0.80		
Indonesia Earthquake	1996	8.1	2.00		
Chili central Coast Earthquake	2010	8.8	1.28		22h20m

Website of Japan Meteorological Agency (JMA)

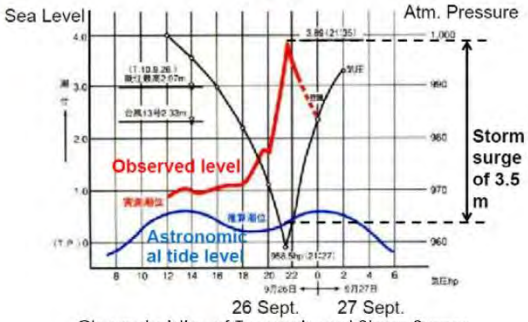
6

Triggers for reviewing disaster management on ports in Japan

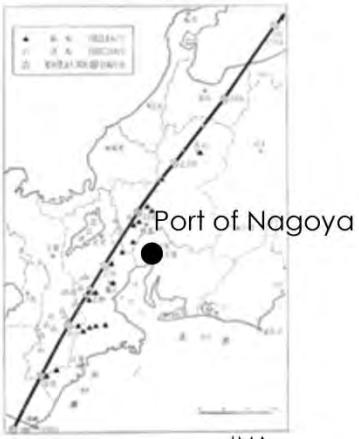
Typhoon	
Ise-Bay Typhoon	Sep.26, 1959
Earthquake	
Hanshin Awaji Earthquake	Jan. 17, 1995
Tsunami	
Chili Tsunami	May 23, 1960
Indian Ocean Tsunami	*Dec. 26, 2004*
Great East Japan Earthquake	Mar.11, 2011

7

Ise-Bay Typhoon



Characteristics of Tsunamis and Storm Surges as a Basis of Disaster Mitigation, International Seminar on Introduction of Coastal Disaster Management Tuesday, 3 March 2015, Manila, Philippine, Dr. Takashi Tomita



JMA

Central pressure: 895hPA (Minimum) / 3rd lowest pressure on record
Strong wind: 45.4 m /s at the month of Ise-Bay
Heavy typhoon: 750 km on the east/650 km on the west of strong wind area
Storm surge: 389 cm / the top on record at Nagoya Port

From website of Japan Meteorological Agency (JMA)

Damage caused by the typhoon

- Dike was collapsed by attack of storm surge accompanied by high wave
- Houses, factories, hospitals and public facilities were damaged by inundation
- Damage extended to infrastructures
- Activities in suffered area were paralyzed for a long period of time

Dead and missing persons	5,098
Injured persons	38,921
Flooded House	363,611
Collapsed House	40,838
Partially Collapsed House	113,052

Website of Cabinet Office

9

Economic Loss

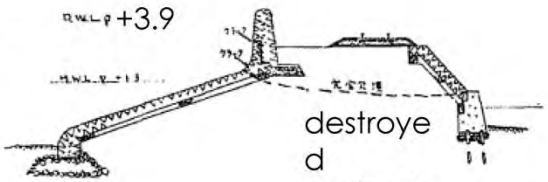
- The total estimated loss in two prefectures facing the Ise Bay was about 505 billion yen (approximately 40% of GNP at that time)
- The loss of public infrastructures such as dikes across the country amounted to about 83.9 billion yen (approximately 6% of GNP).
- Regarding the port of Nagoya, the total amount of loss was about 1 billion yen, however the outflow of timbers stored in the timber pond in the port caused serious damage to houses and factories in the area near the port.

From Website of Cabinet Office

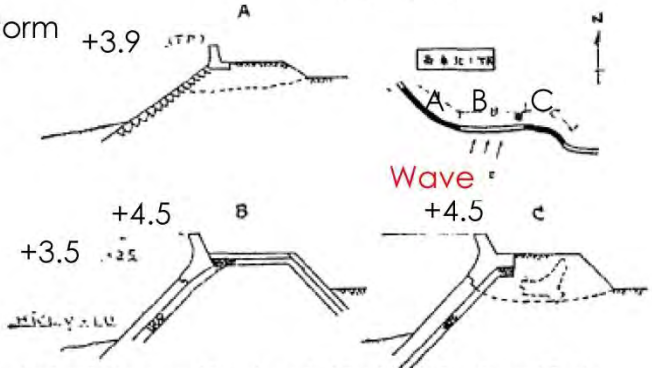
10

Damages of Facilities

Damage of the timber storage pond wall by wave power



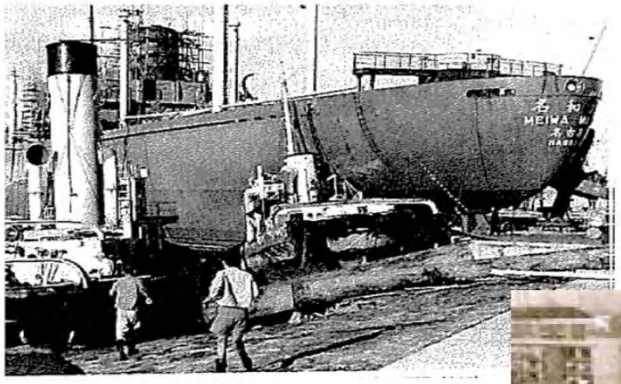
Damage of dike by storm surge/high wave



Damages of structures caused by Ise-Bay Typhoon and the characteristics,1960, / Tsuruta and Goda

11

Damage of Nagoya Port



History of the Port of Nagoya in 100 Years etc,

12

Earthquake which attacked Port of Kobe

Date and; 5:46 AM, January 17(Tuesday), 1995
Distance of Epicenter; about 20 km
Depth of epicenter; Approximately 16 km
Magnitude; 7.3 on the Richter Scale
Human Damage; Dead 6401, Injured 40,092
Property Damage;
Partially/completely destroyed house by earthquake ; 240,956
Partially/completely destroyed house by fire; 7,456
Number of Evacuees; 316,678 at the peak (as of January 23, 1995)
Damage to essential services (numbers of households at peak)
Electricity blackout in 1 million, Gas; service cut off to 845,000 ,
Water; service cut off 1.27 million
Financial cost of damage; Approx.9,926.8 billion yen (estimate)

13

Damage of Kobe Port

Container Berth in Rokko Island

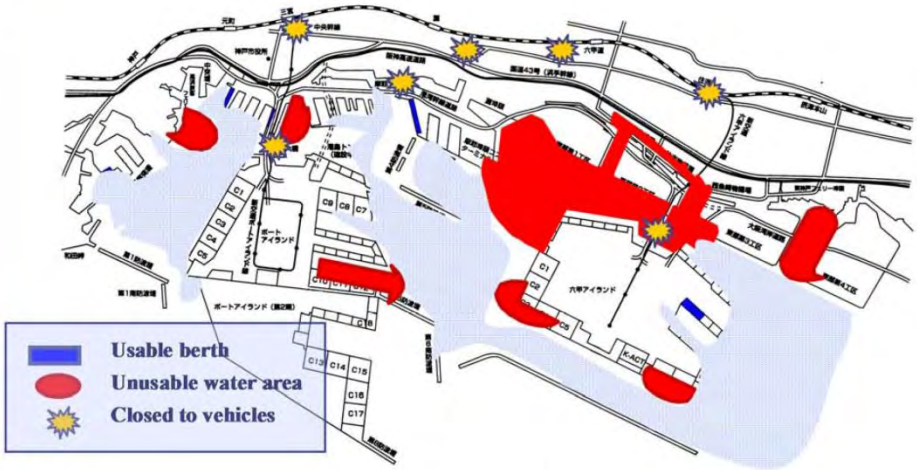
Container Berth in Port Island

Access Road to Port Island

Road Connecting with Wharfs

14

Kobe Port immediately after the Earthquake



Ports and Harbour Bureau ,MLIT

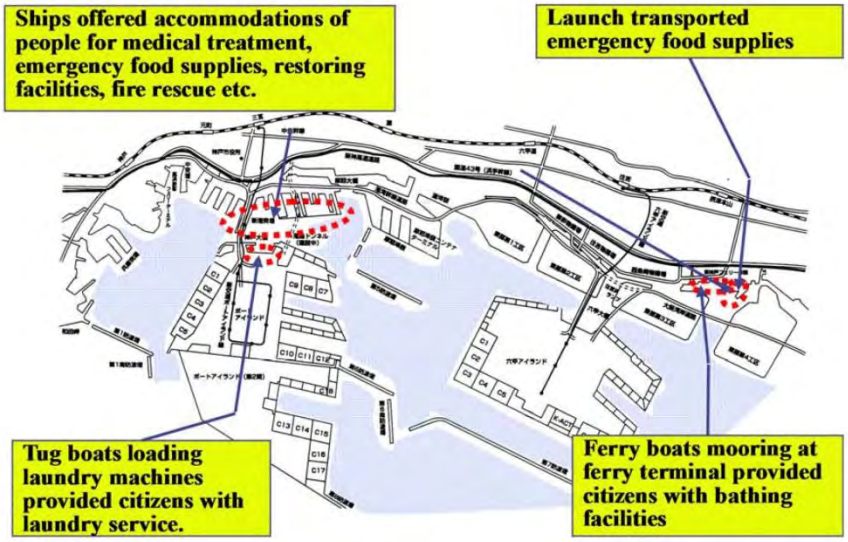
15

Relief Supplies transported through a port

Kobe Port Revival –Overcoming damage from 1995 Southern Hyogo Earthquake/ Kobe City

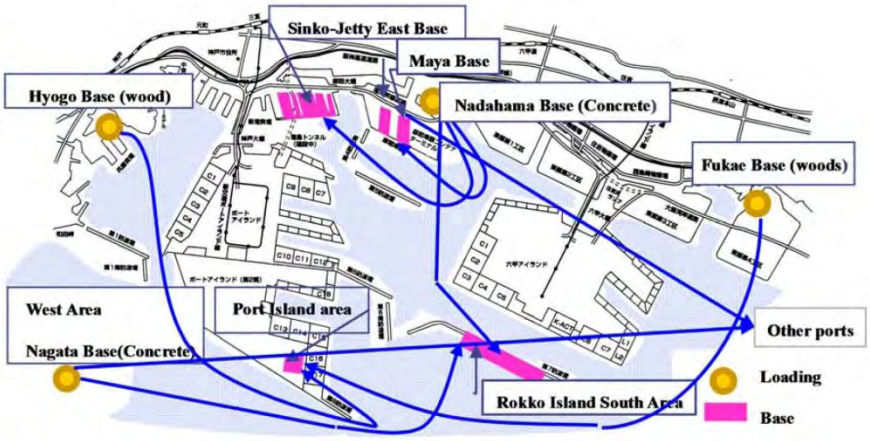
16

Berths used by Ships for Emergency Measures



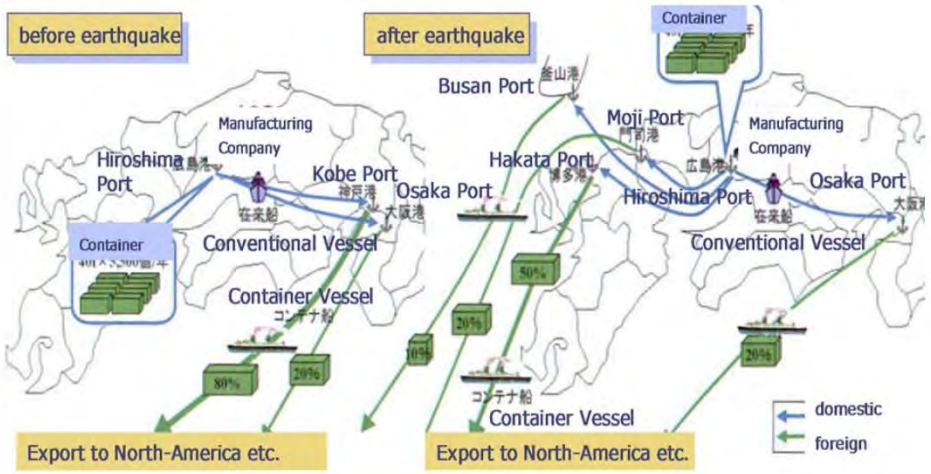
MLIT 17

Disposal Site and Transportation Route of Rubble



MLIT 18

Change of Container Flow after the Earthquake



MLIT

19

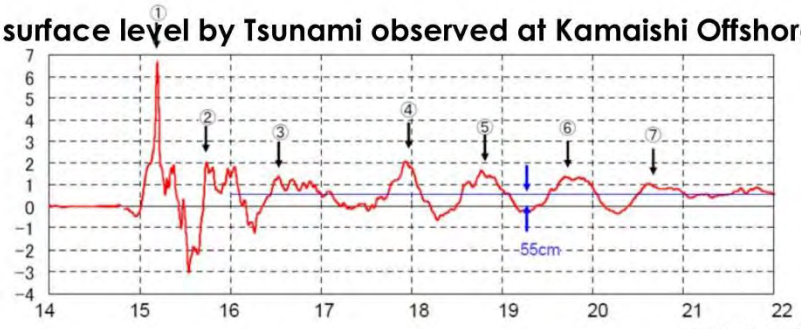
Great East Japan Earthquake and Tsunamis

Outline of The 2011 Great East Japan Earthquake

Date and Time:	11 March 2011 14:46 JST (05:46 UTC)
Hypocenter:	38° 6.2′ N, 142° 51.6′ E (130km ESE off Oshika Peninsula) Depth 24km
Magnitude:	9.0 (the largest earthquake recorded in Japan)
JMA Seismic Intensity:	7 (Max) (Kurihara City of Miyagi Prefecture

From website of Japan Meteorological Agency (JMA)

Sea surface level by Tsunami observed at Kamaishi Offshore

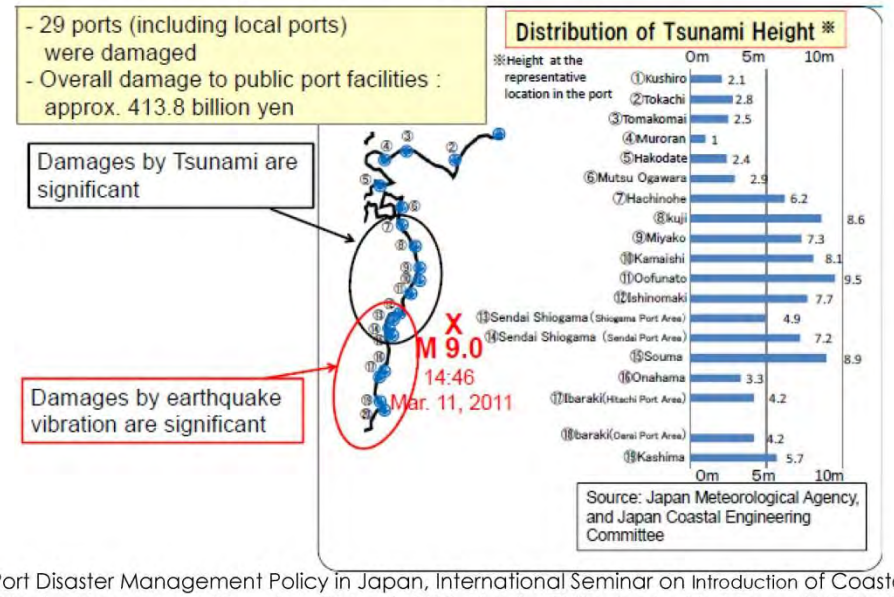


Website of MILT

20

Tsunami caused by Great East Japan Earthquake

- 29 ports (including local ports) were damaged
- Overall damage to public port facilities : approx. 413.8 billion yen



Port Disaster Management Policy in Japan, International Seminar on Introduction of Coastal Disaster Management Tuesday, 3 March 2015, Manila, Philippine by Mr. Masayuki Harigai

21

Damages of Port Facilities

Port facilities	Main Damage observed
Breakwater	fallen down, submerged, destroyed, declined
Quay	moved forward, sunk, uplifted, swollen, hollowed, backfilled stone lost
Apron	sunk, uplifted, swollen, pavement damage, difference in level from neighboring apron
Yard	Sunk
Revetment	collapsed, foot protection blocks damage, parapet damage
Channel	Sedimentation, substances fallen down into waters
Equipment	Rail deform, crane fallen down
access road	difference in level from apron
others	stranded barge/vessels

Prepared from a material for the 41st Port Committee, Transport Policy Council (14 Apr. 2011)

22

Breakwater

Kamaishi Port

Hachinohe Port

Quay

Ibaragi Port

Kashima Port

Port and Airport Research Institute, Kanto Regional Development Bureau MLIT etc.

23

Apron/yard

Sendai-Shiogama Port

Kashima Port

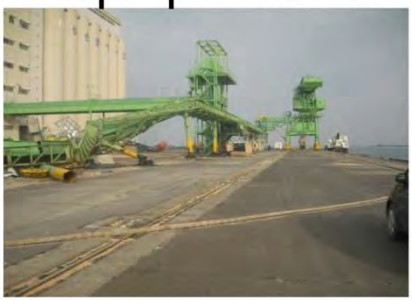
Ibaragi Port

Ofunato Port

Port and Airport Research Institute, Kanto Regional Development Bureau MLIT etc.

24

Equipment



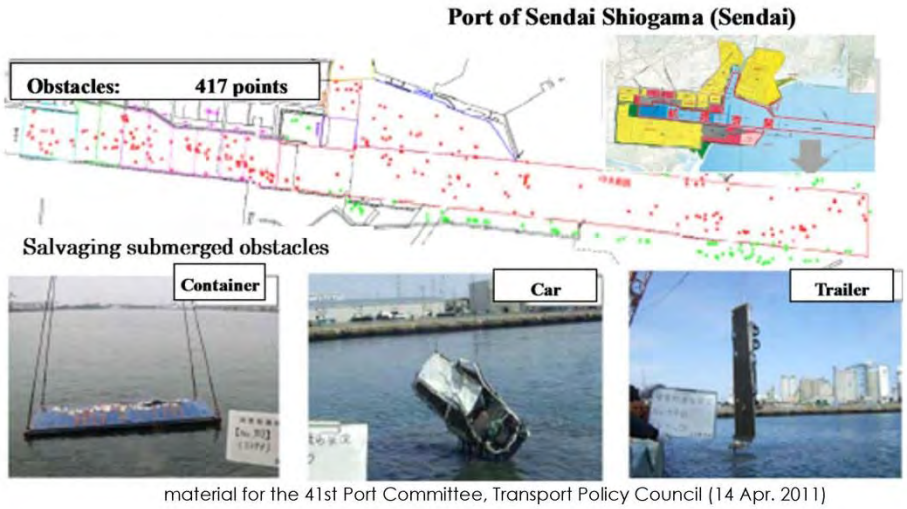
Revetment

Stranded vessel

Port and Airport Research Institute, Kanto Regional Development Bureau MLIT etc.

25

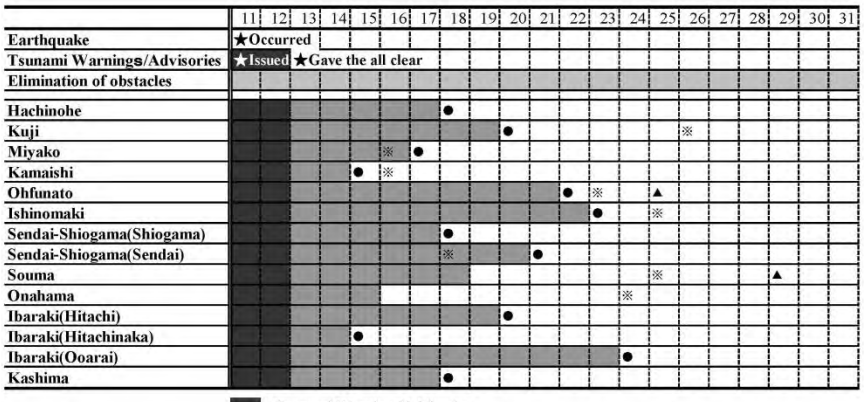
Waterway Clearance at Port of Sendai-Shiogawa



material for the 41st Port Committee, Transport Policy Council (14 Apr. 2011)

26

Start of partially use of ports



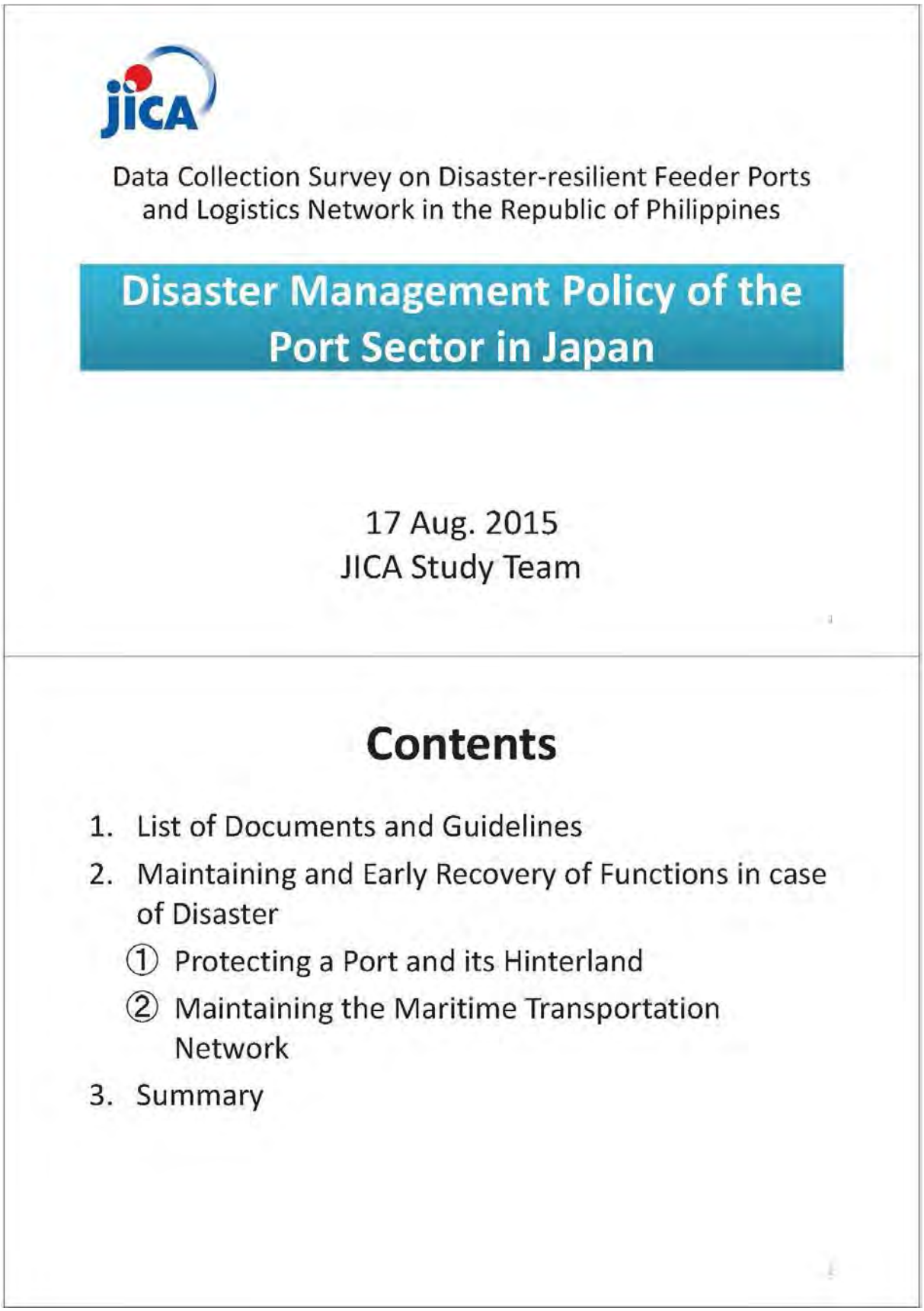
Source: prepared from a material for the 41st Port Committee, Transport Policy Council (14 Apr. 2011)

27

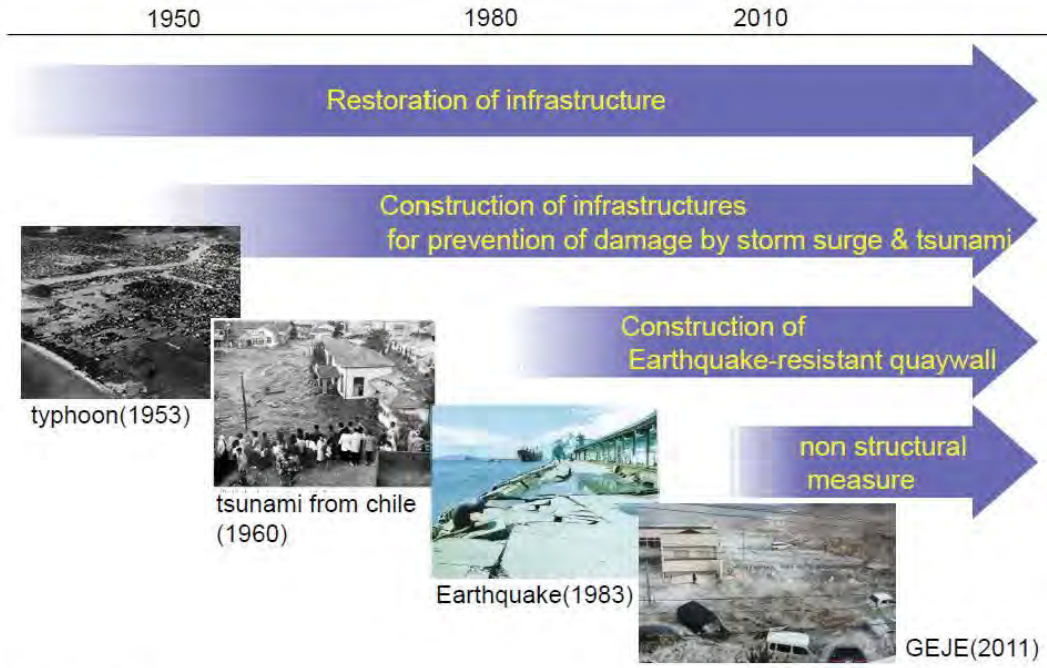
- to **grasp the situation** of afflicted areas and damaged facilities as soon as possible
- to play roles as a base of rescue and emergency operation **immediately after the events** occurred
- to **provide accurate information** on situations of ports to the public
- To pay attention to **business continuity**
- to **restore the port facilities** and **provide services** as soon as possible
- to implement restoration work based **on long term viewpoints**

28

2) Disaster Management Policy of the Port Sector in Japan



History of Port Disaster Management



Source: MLIT

3

List of Documents and Guidelines

Disasters that Triggered Port and Harbor Policy		Disaster Management Guideline for Port and Harbor (MLIT*)	Keywords Structural, Non-structural measures
1995	Great Hanshin-Awaji Earthquake (17 Jan.)	Basic Guideline for the Countermeasure Facilities against Large-Scale Earthquakes (Dec. 1996)	✓ Earthquake-resistant Quay Walls ✓ Open Space
2004	Indian Ocean Earthquake and Tsunami (26 Dec.)	Guideline for Ports Having High Resistance against Earthquakes (Mar. 2005)	✓ Storage Facilities for Emergency Relief Goods ✓ Emergency Transportation Roads ✓ Hazard Map ✓ Information Devices for Tsunami
2011	Great East Japan Earthquake (11 Mar.)	Guidelines for Countermeasures Against Earthquake and Tsunami Disasters (June 2012)	✓ Tenacious Structure ✓ High Earthquake-resistant Quay Walls ✓ Disaster-Tolerant Shipping Network
		Guideline for Business Continuity Plan (BCP) (Mar. 2014)	✓ Business Continuity Plan (BCP) ✓ Business Continuity Management (BCM)

* Ministry of Land Infrastructure and Tourism and Transport (MLIT)

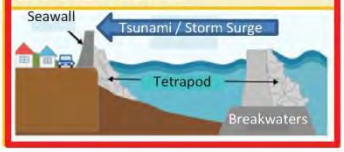
4

Maintaining and Early Recovery of Functions in case of Disaster

(1) Protecting a Port and its Hinterland

1a. Introduction of Multiple Protections and Durable Structures

1b. Construction of Seawalls and Breakwaters



1c. Study on Protection Level for Major Ports

1d. Promoting of Effective Management on Water Gate and Land Lock

1e. Study on Evacuation Measures around a Port

Tsunami Evacuation Tower

1f. Formulation of Hazard Maps

Example of Tsunami Hazard Map

Structural Measures ⟷ Non-Structural Measures

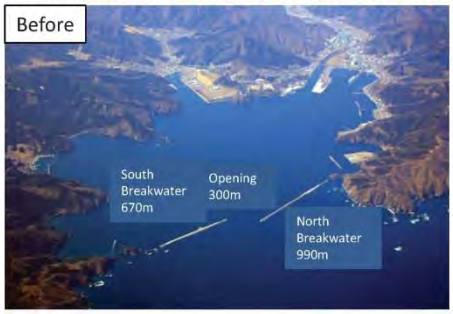
Source: MLIT

5

(1) Protecting a Port and its Hinterland

1b. Construction of Seawalls and Breakwaters

Kamaishi Great Tsunami Breakwater was damaged by Great East Japan Earthquake



Kamaishi Great Tsunami Breakwater

- Work Term: 30years
- Cost: nearly $1.6 billion
- Length: 1,660m (1mile)
- Height: 207 feet deep and jutting nearly 20 feet above the water

World's Deepest Breakwater (Guinness World Record)

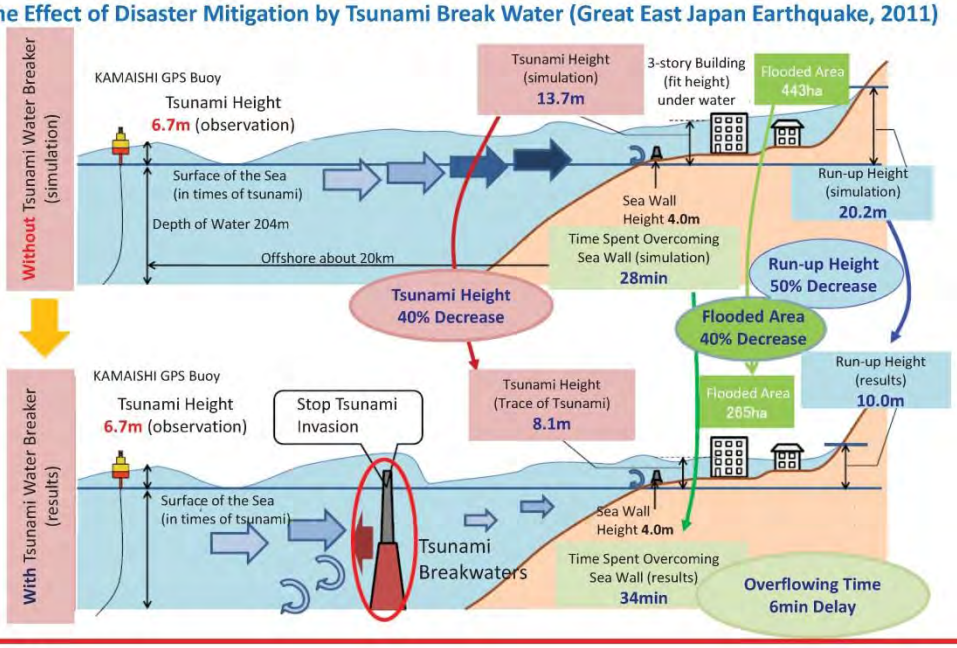
Source: MLIT

6

(1) Protecting a Port and its Hinterland

1b. Construction of Seawalls and Breakwaters

The Effect of Disaster Mitigation by Tsunami Break Water (Great East Japan Earthquake, 2011)



Source: MLIT

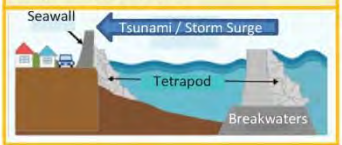
7

Maintaining and Early Recovery of Functions in case of Disaster

(1) Protecting a Port and its Hinterland

1a. Introduction of Multiple Protections and Durable Structures

1b. Construction of Seawalls and Breakwaters



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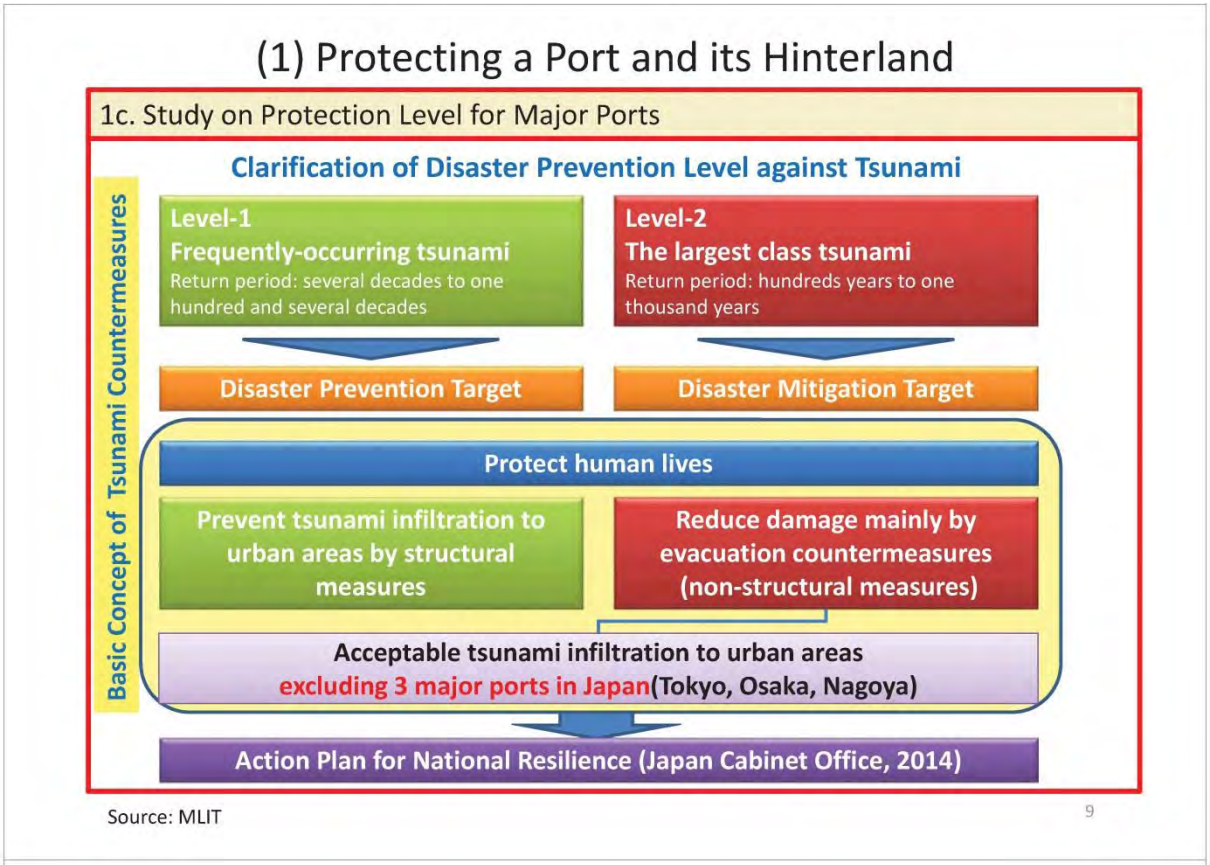
Example of Tsunami Hazard Map

Structural Measures ⟷ Non-Structural Measures

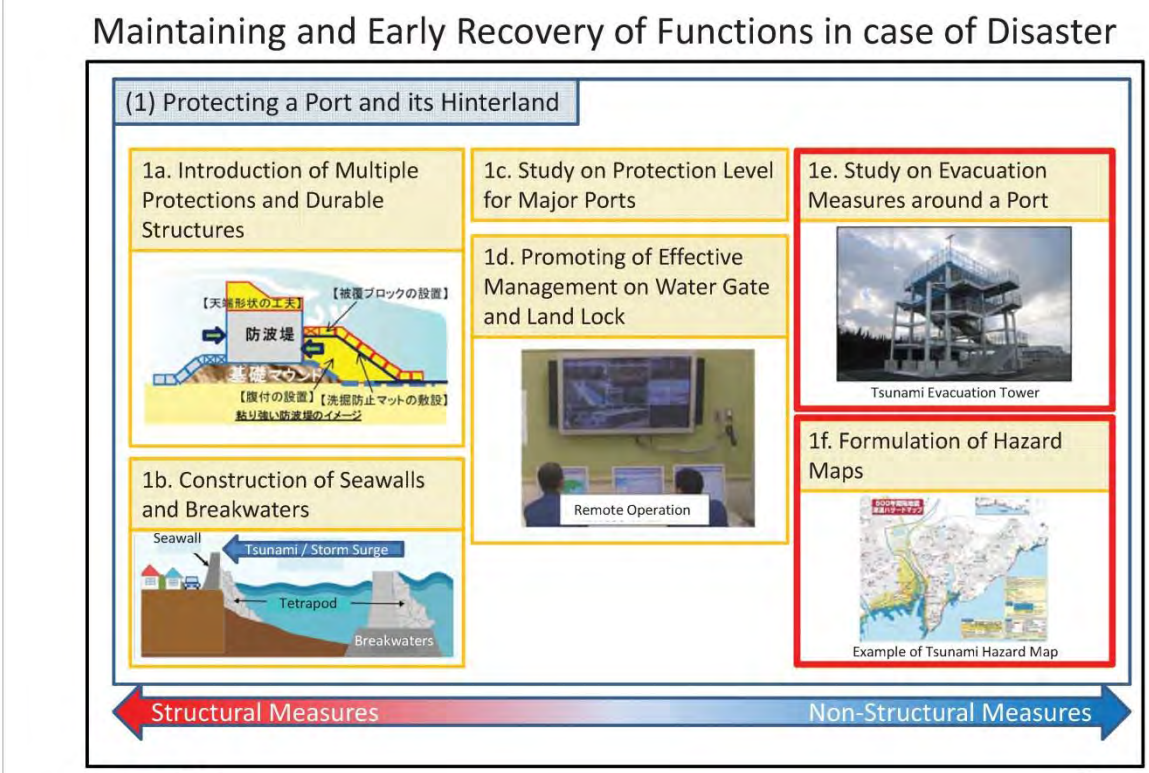
Source: MLIT

8



Source: MLIT

9



Source: MLIT

10

(1) Protecting a Port and its Hinterland

1e. Study on Evacuation Measures around a Port

1f. Formulation of Hazard Maps

Achieve Prompt Evacuation for Island Areas (Earthquake and Tsunami Estimation)

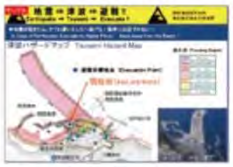
Self-help and Mutual Assistance Initiatives

- Prepare for and fear tsunami appropriately

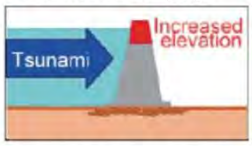
Public Assistance Initiatives

- Evacuation measures covering both facilities and logistics
- Protect lives and property from occurrence of tsunami

Evacuation Drill



Tsunami Advisory sign



Raising Coastal Embankments

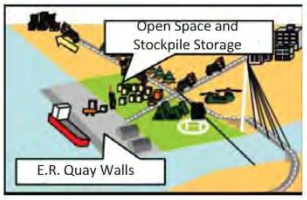
Source: Tokyo Metropolitan Government

11

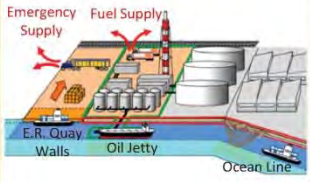
Maintaining and Early Recovery of Functions in case of Disaster

(2) Maintaining the Maritime Transportation Network

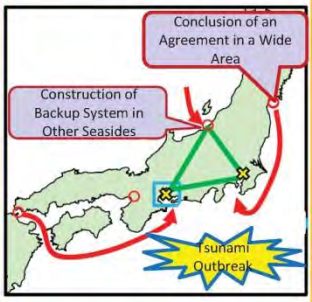
2a. Disaster Prevention Shelter Base (Earthquake-resistant Quay Walls)



2b. Strengthening an Industrial Complex next to Ports



2c. Disaster-Tolerant Maritime Transportation Network/ Port Business Continuity Plans (Port BCP)



Structural Measures ⟷ Non-Structural Measures

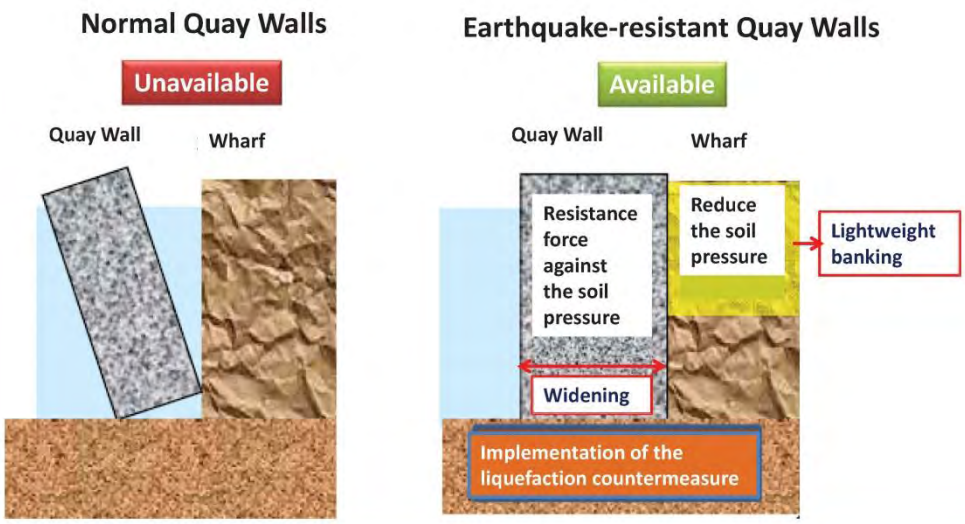
Source: MLIT

12

(2) Maintaining the Maritime Transportation Network

2a. Disaster Prevention Shelter Base (Earthquake-resistant Quay Walls)

Large-Scale Earthquake Behavior of the Differences between Normal Quay Walls and Earthquake-resistant Quay Walls



Source: MLIT

13

(2) Maintaining the Maritime Transportation Network

2a. Disaster Prevention Shelter Base (Earthquake-resistant Quay Walls)

Normal Quay Walls and Earthquake-resistant Quay Walls after Great East Japan Earthquake (e.g. Onahama Port, Fukushima)

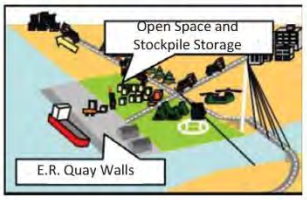
Source: MLIT

14

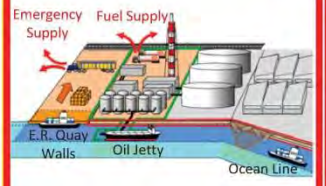
Maintaining and Early Recovery of Functions in case of Disaster

(2) Maintaining the Maritime Transportation Network

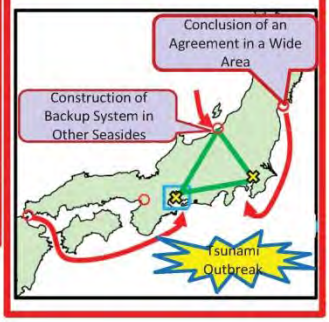
2a. Disaster Prevention Shelter Base (Earthquake-resistant Quay Walls)



2b. Strengthening an Industrial Complex next to Ports



2c. Disaster-Tolerant Maritime Transportation Network/ Port Business Continuity Plans (Port BCP)



Structural Measures — Non-Structural Measures

Source: MLIT

15

(2) Maintaining the Maritime Transportation Network

2a. Disaster Prevention Shelter Base (Earthquake-resistant Quay Walls)

2b. Strengthening an Industrial Complex next to Ports

2c. Disaster-Tolerant Maritime Transportation Network/ Port BCP

Reduce the effects of isolation in island areas due to an earthquake-triggered tsunami

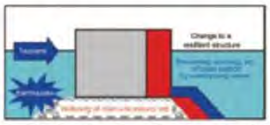
Self-help and Mutual Assistance Initiatives

- Stockpile one week's worth of supplies (home, workplaces and stores)

Public Assistance Initiatives

- Encourage expanding stockpile system and securing power sources
- Strengthen the delivery system of relief supplies

Fuel stockpile in island areas



Establish wharf and other facilities for emergency transports

Source: Tokyo Metropolitan Government

16

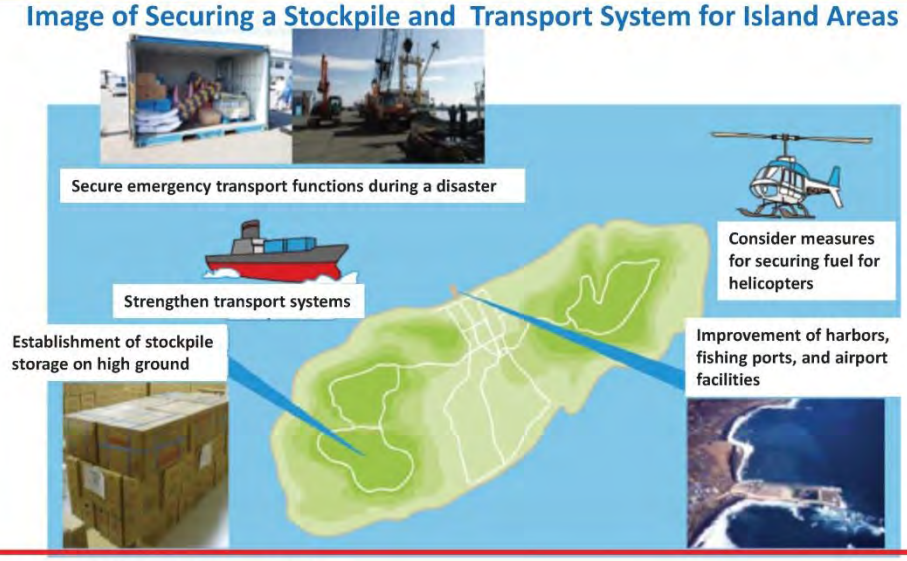
(2) Maintaining the Maritime Transportation Network

2a. Disaster Prevention Shelter Base (Earthquake-resistant Quay Walls)

2b. Strengthening an Industrial Complex next to Ports

2c. Disaster-Tolerant Maritime Transportation Network/ Port BCP

Image of Securing a Stockpile and Transport System for Island Areas



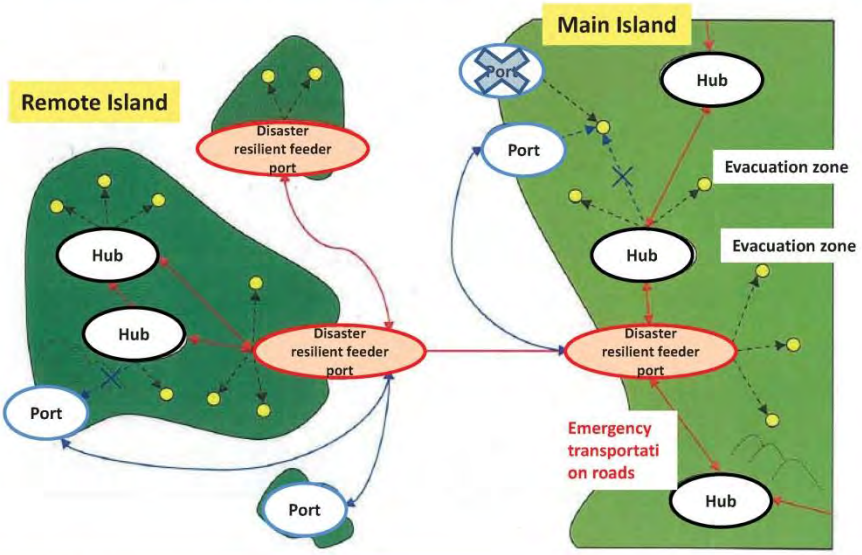
Source: Tokyo Metropolitan Government

17

(2) Maintaining the Maritime Transportation Network

2c. Disaster-Tolerant Maritime Transportation Network/ Port BCP

Image of Maritime Transportation Network for Island Areas in times of Disaster

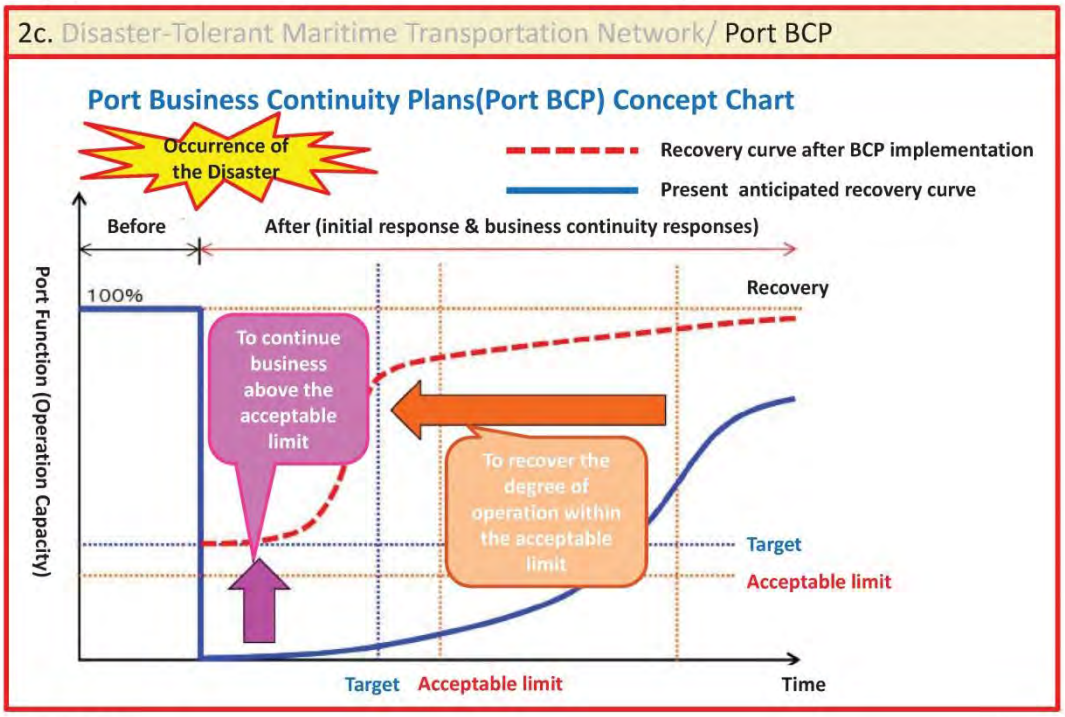


Source: Nagasaki Prefecture Government

18

(2) Maintaining the Maritime Transportation Network

2c. Disaster-Tolerant Maritime Transportation Network/ Port BCP

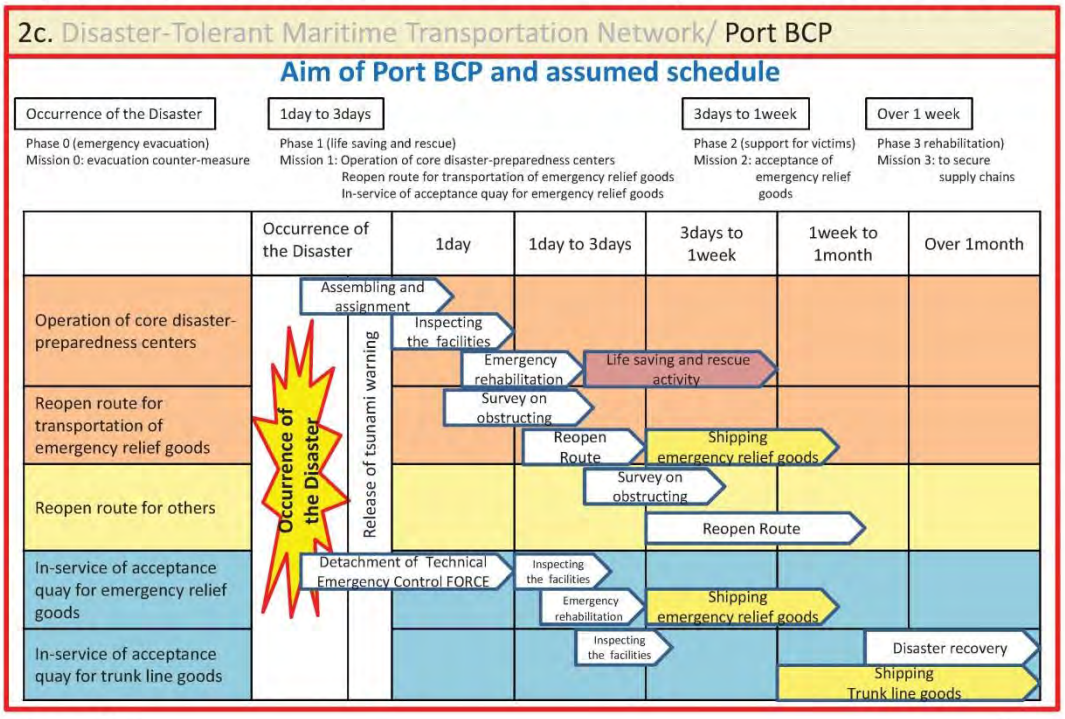


Source: MLIT

19

(2) Maintaining the Maritime Transportation Network

2c. Disaster-Tolerant Maritime Transportation Network/ Port BCP



Source: MLIT

20

Summary

1. Overemphasis "Structural measures" converts coexistence with "Non-structural measures"
   - **Construction of Earthquake-resistant Quay Walls(1980s) in addition, Hazard Map and Port BCP, etc. (2000s)**
2. Clarification of "Disaster prevention" and "Disaster mitigation"
   - **Tsunami Level-1 and Level-2**
3. Enhancement of disaster-response based on "Port-BCP"
   - **Management Plan(preparedness) and Response plan(after disaster)**
4. Disaster-tolerant maritime transportation network in cooperation with among ports
   - **Securing a Stockpile and Transport System**

21

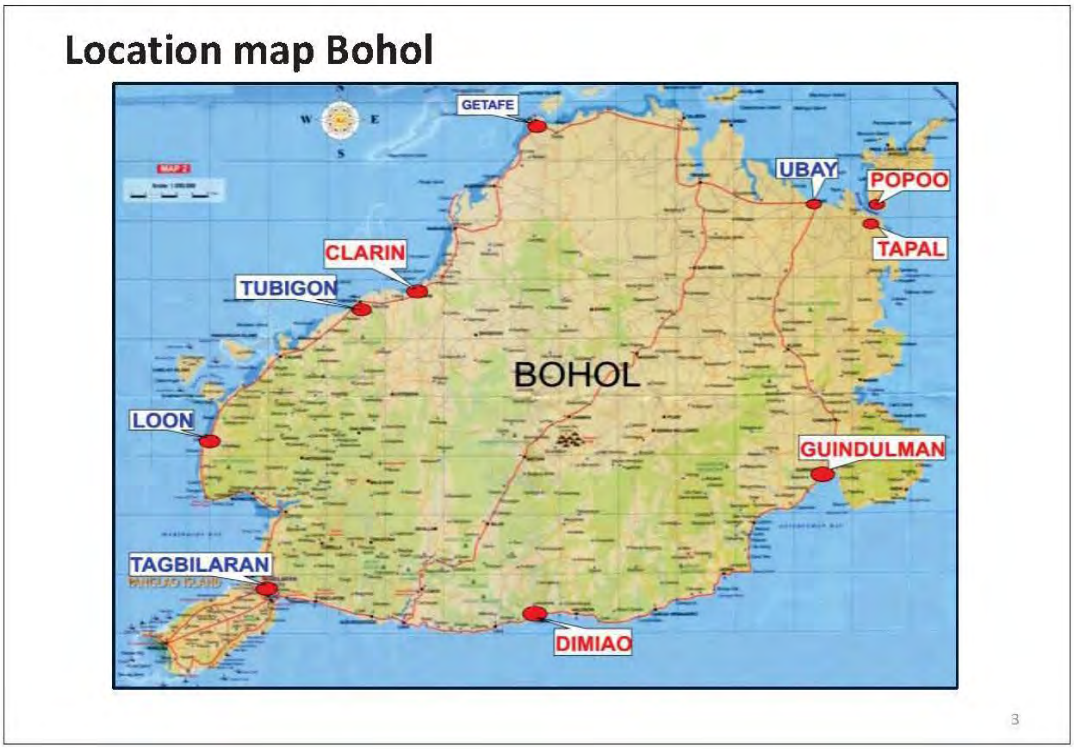
Thanks for your attention!

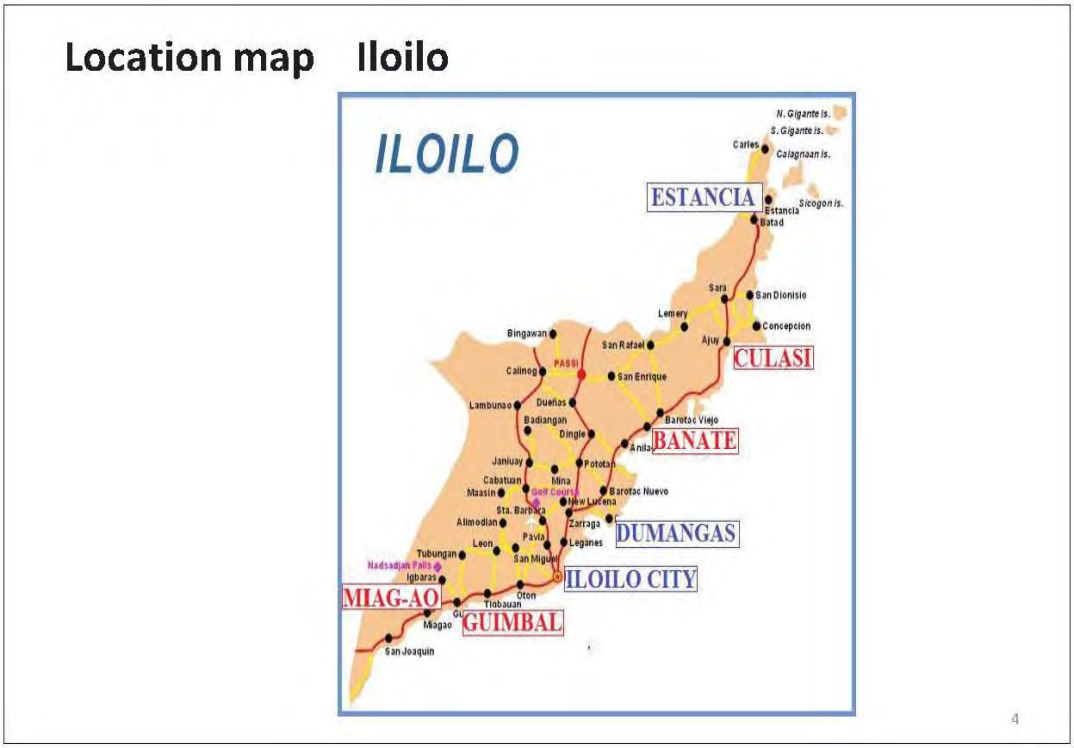
JICA Study Team

The Overseas Coastal Area Development Institute of Japan

Oriental Consultants Global Co., Ltd.

3) Field Survey Results



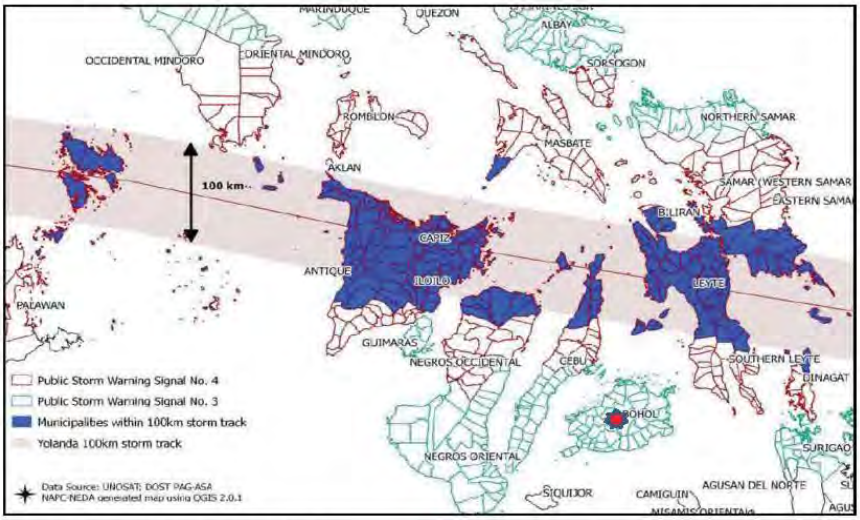


List of Surveyed Ports

Province	No	Port	Jurisdiction
Leyte (East)	1	Tacloban	PPA
	2	Babatngon	LGU
	3	Ormoc	PPA
	4	Palompon	PPA
Leyte (West)	5	Isabel	PPA
	6	Baybay	PPA
	7	Hindang	LGU
	8	Hilongos	PPA
	9	Bato	LGU
Bohol	10	Tagbilaran	PPA
	11	Loon	PPA
	12	Tubigon	PPA
	13	Clarin	LGU
	14	Getafe	PPA
	15	Ubay	PPA
	16	Tapal	PPA
	17	Popoo	LGU
	18	Guindulman	LGU
	19	Damiao	LGU
Iloilo	20	Iloilo	PPA
	21	Dumangas	PPA
	22	Banate	LGU
	23	Culasi/Ajuy	LGU
	24	Estancia	PPA
	25	Guimbal	LGU
	26	Miagao	LGU

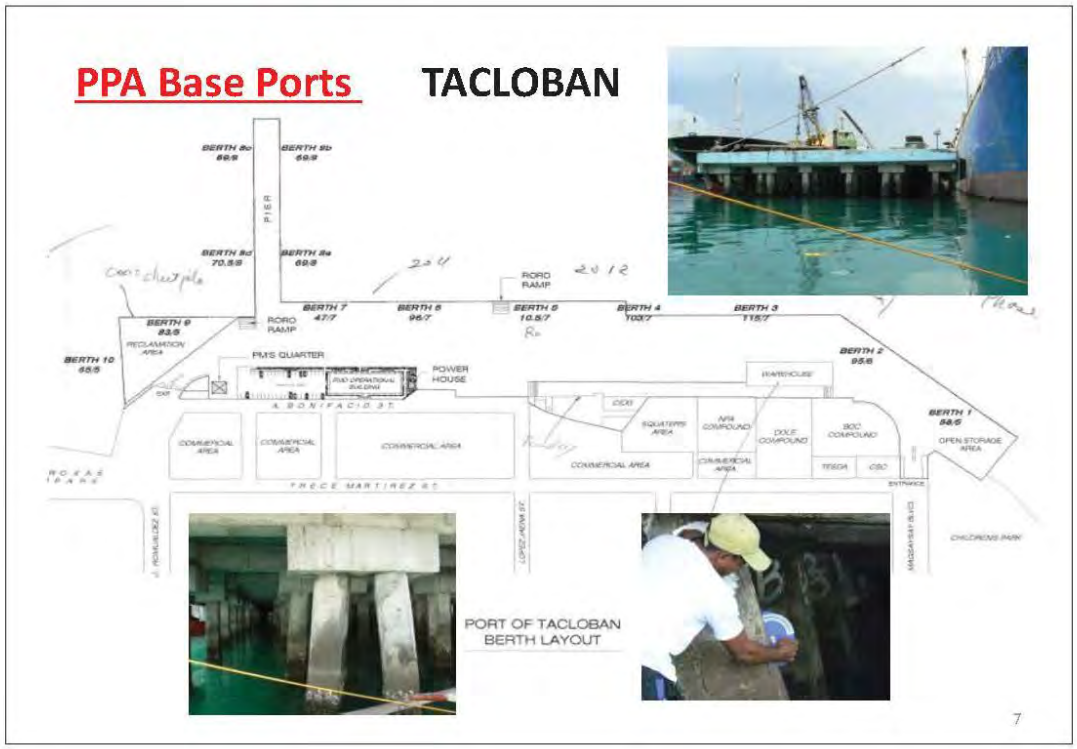
5

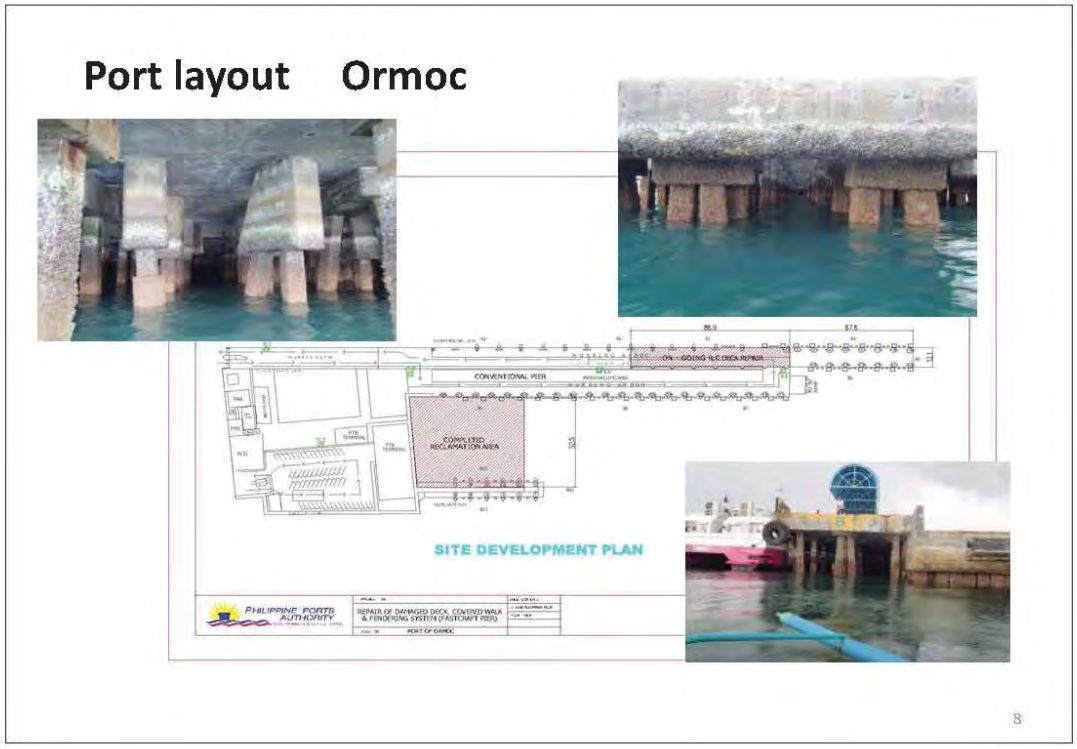
Typhoon Yolanda Track and Hypocenter

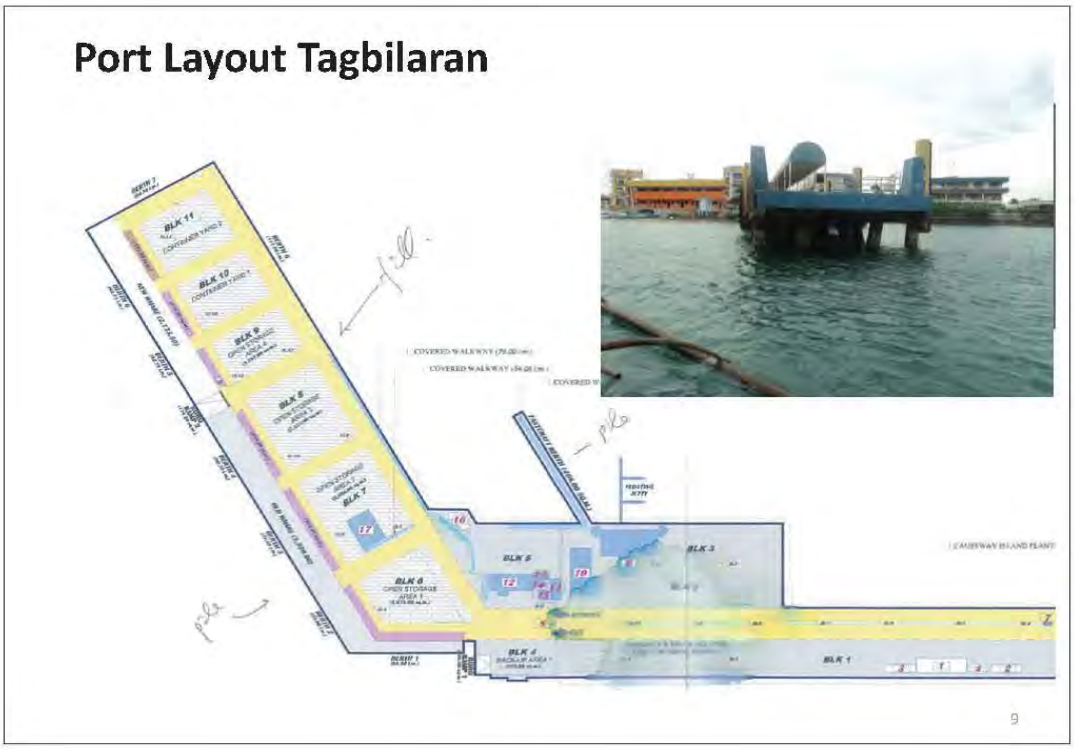


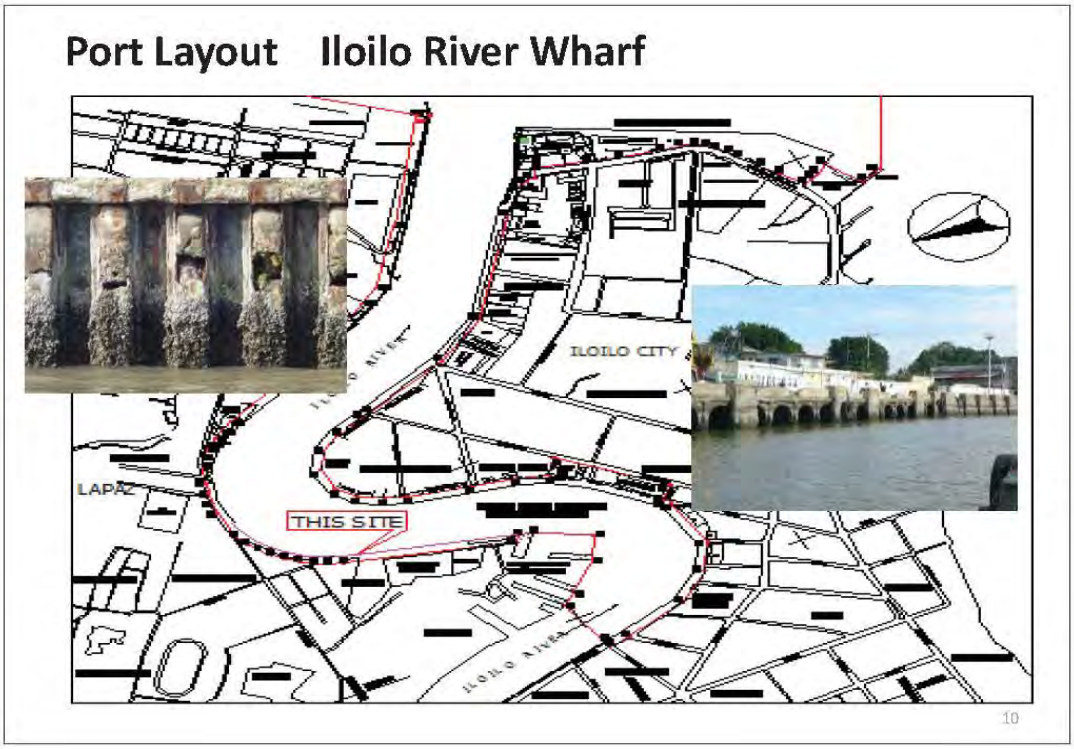
Yolanda: November 8, 2013 Earthquake: October 15, 2013

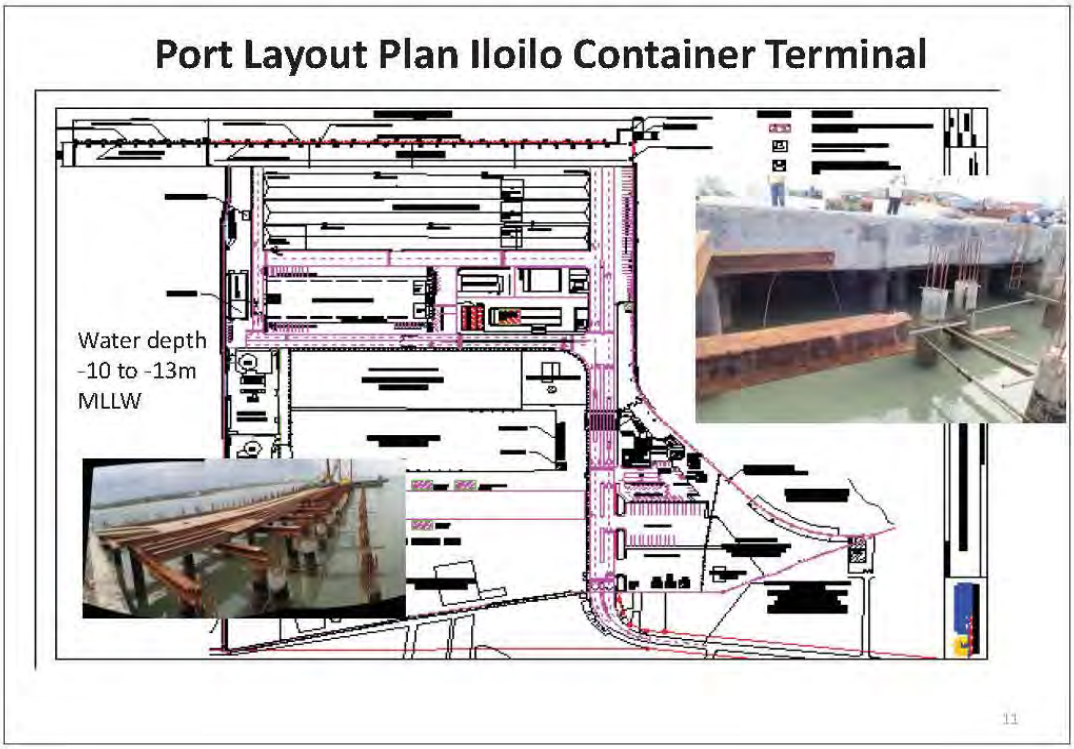
6

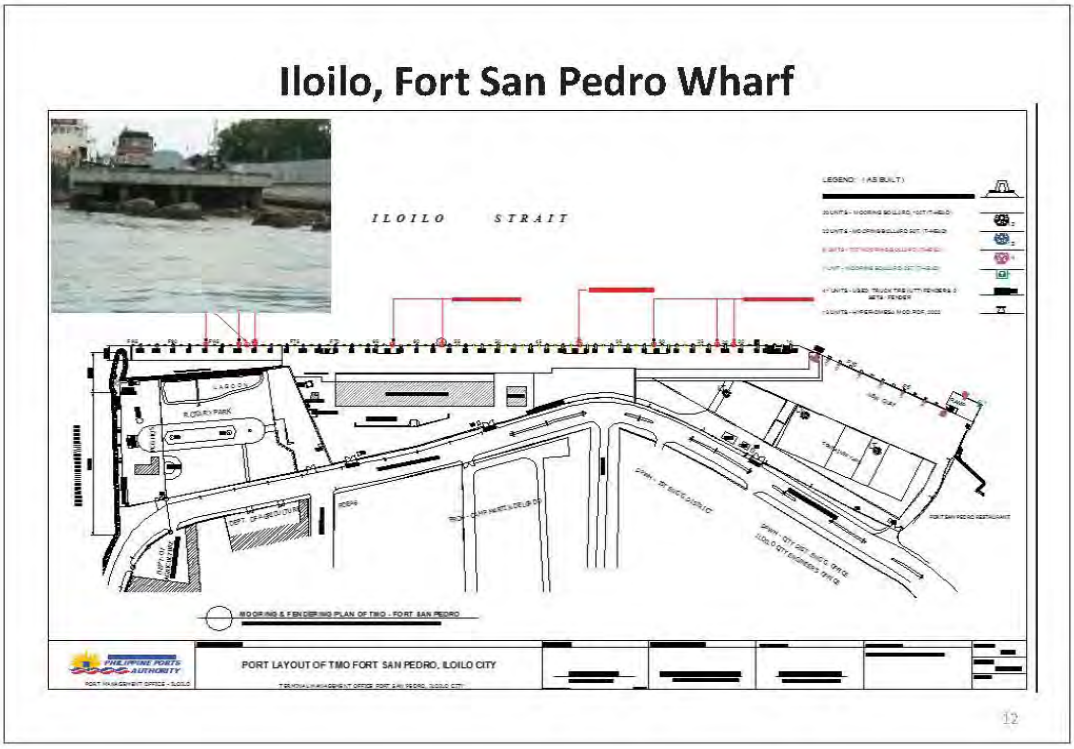

PPA Base Ports
TACLOBAN
PORT OF TACLOBAN
BERTH LAYOUT
7


Port layout
Ormoc
CONVENTIONAL PIER
COMPLETED RECLAMATION AREA
SITE DEVELOPMENT PLAN
PHILIPPINE PORTS AUTHORITY
8

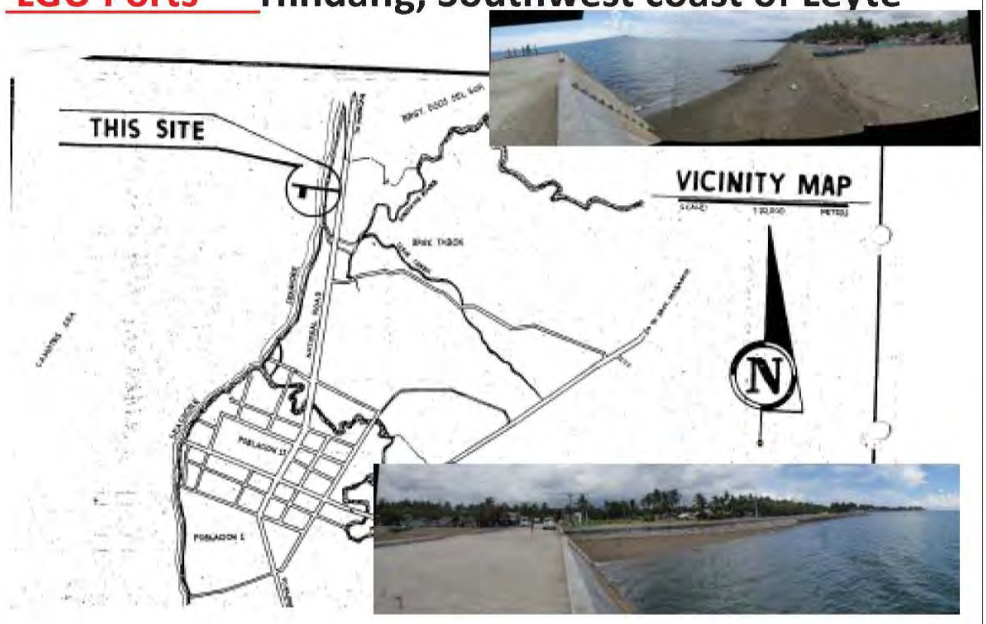

Port Layout Tagbilaran
BLK 11
BLK 10
BLK 9
BLK 8
BLK 7
BLK 6
BLK 5
BLK 4
BLK 3
BLK 2
BLK 1
9


Port Layout Iloilo River Wharf
ILOILO CITY
LAPAZ
THIS SITE
10


Port Layout Plan Iloilo Container Terminal
Water depth
-10 to -13m
MLLW
11

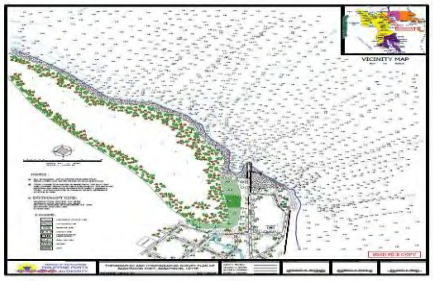

Iloilo, Fort San Pedro Wharf
ILOILO STRAIT
PORT LAYOUT OF TMO FORT SAN PEDRO, ILOILO CITY
12

LGU Ports Hindang, Southwest coast of Leyte



13

Babatungong, North coast of Leyte



San Juanico Channel passable LOA = 100m

Babatungong causeway stair-landing

14

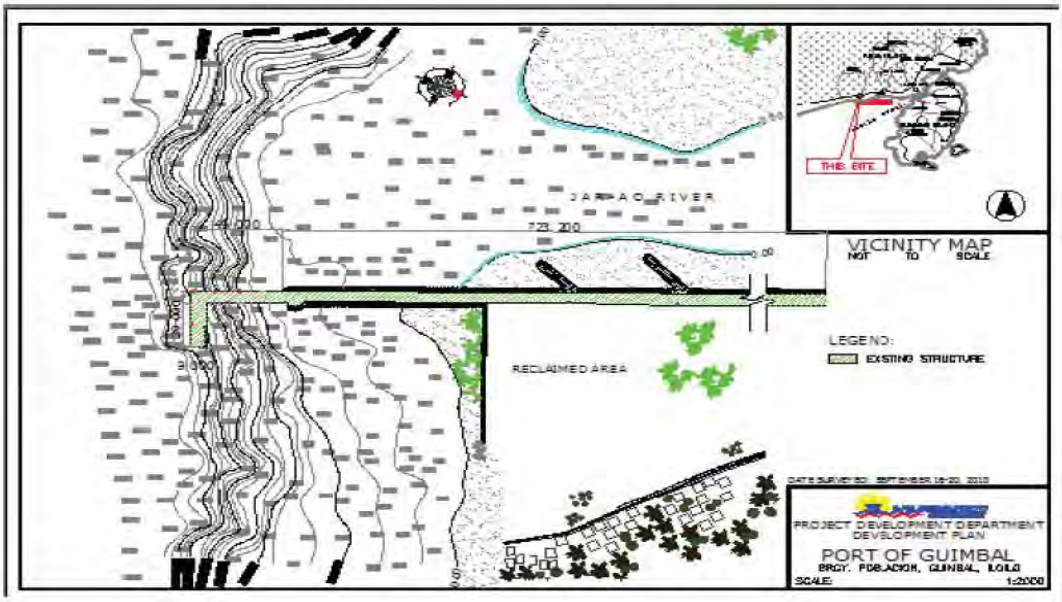
Guindulman, Southeast coast of Bohol

15

Dimiao, South coast of Bohol

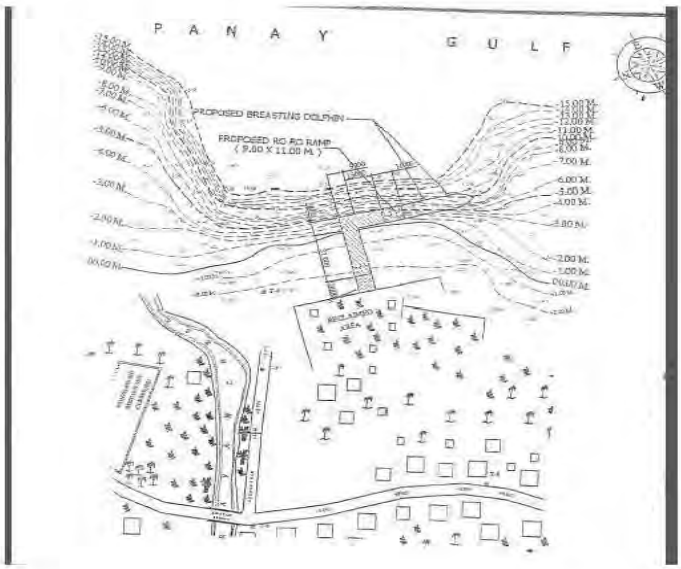
16

Guimbal, Iloilo Prov., South coast of Panay



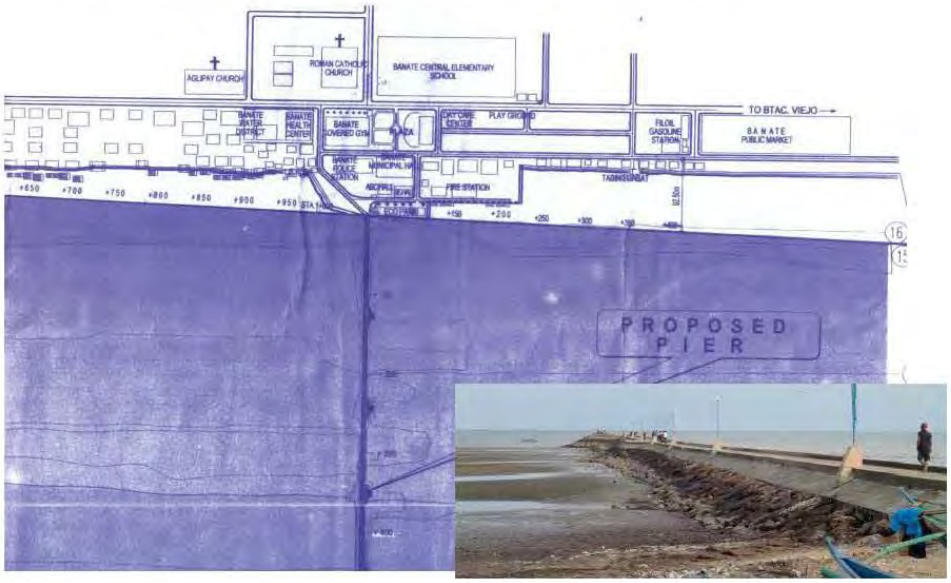
17

Miyagao, Iloilo Prov., South coast of Panay



18

Banate, Iloilo Prov., East coast of Panay



19

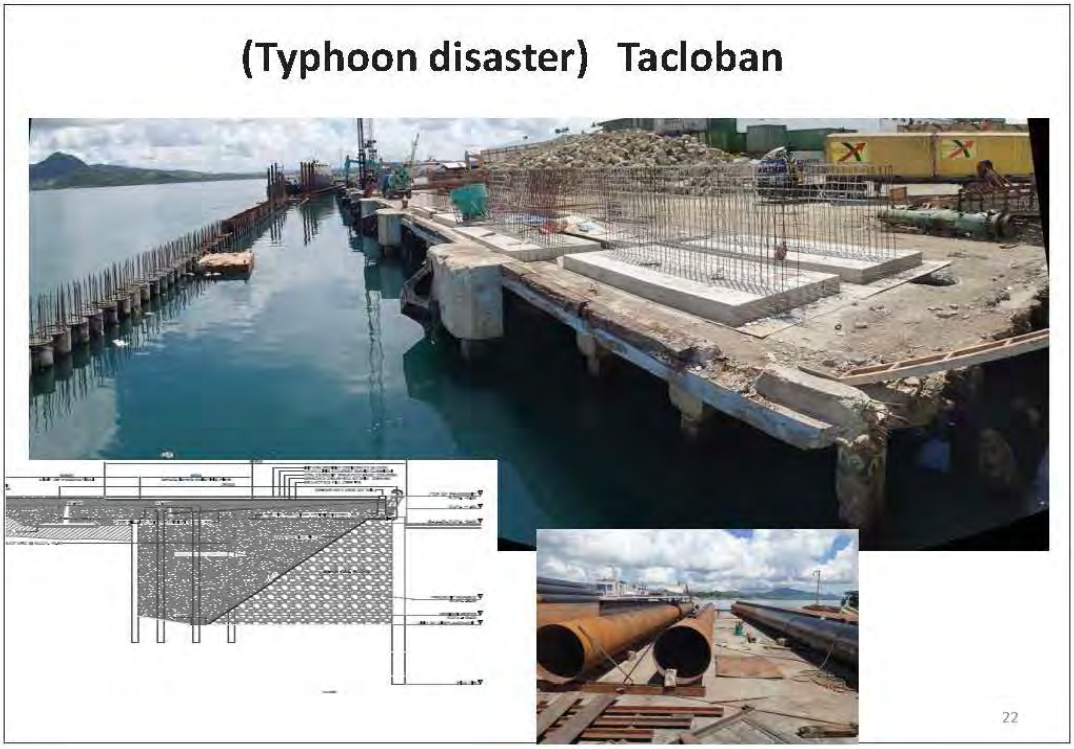
Situation of Disaster
Typhoon disaster , Tacloban

PMO Admin. Office renovated.

Admin. Office after the typhoon.

20


Typhoon disaster
Tacloban
Warehouse
21


(Typhoon disaster) Tacloban
22

Typhoon disaster, Estancia

Design water depth -6m MLLW

Remained Dolphins for Power barge made oil spill

Part of conc. decks and pile caps were damaged by Typhoon and repaired in2014

Repaired conc. pavement along the seawall

23

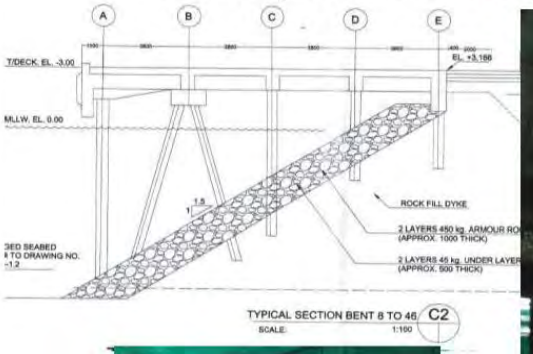
Earthquake disaster, Tagbilaran

Source: PPA

Step at the entrance of Warehouse (Photo: JICA Team)

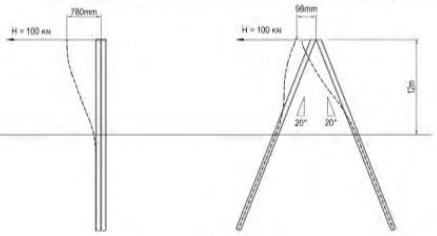
24

Earthquake disaster, Tagbilaran Berths



21/46 of conc. Batter piles damaged (on land side)

Photographs : PPA



5/25 of conc. pile caps of steel tubular batter piles damaged

Steel Pipe Pile : Ø600 x t9 (SKK400)

25

Earthquake disaster

Loon, West coast of Bohol

Damaged pier structures

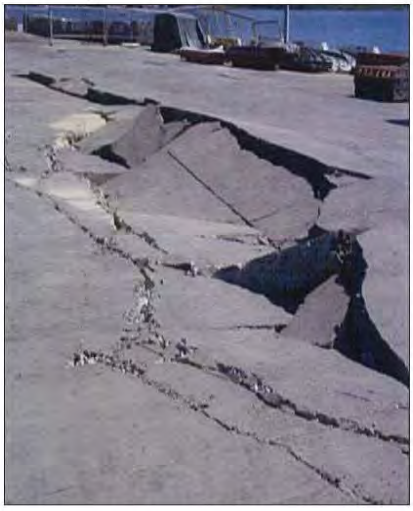
Displaced quay face line

Source: PPA

26

Earthquake disaster

Tubigon, Northern coast of Bohol



Source: PPA

27

Earthquake disaster, Tubigon

Source: JICA Team

Broken and detached land-side batter pile.

Source: PPA

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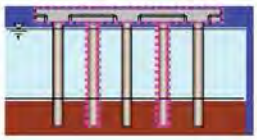
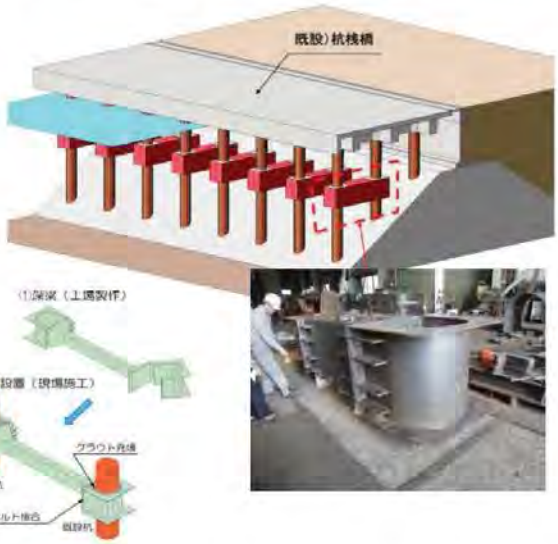
Example Reinforcement of Berthing Facilities



Conventional Method with Additional Piles

Additional Deep Beams



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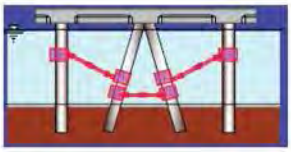
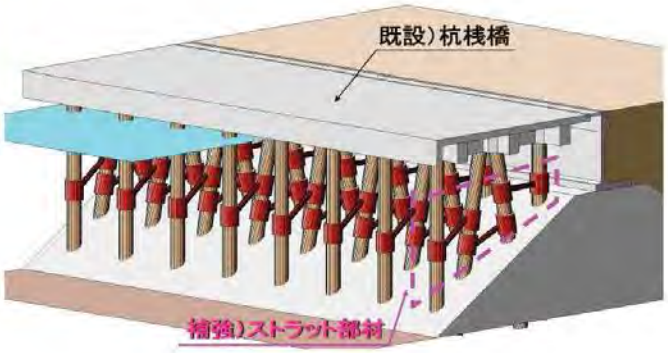
Example Reinforcement of Berthing Facilities



Strut beam method



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END OF PRESENTATION

Thank you very much
for
your support extended to our Survey Team.