2.3. 2nd Seminar

(1) Minutes of the Meeting

Minutes of the meeting with:

DOTC, PPA, LGUs

Date: September 29, 2015.

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

Purpose:
i. Explanation of the policy on compiling a Draft Final Report
ii. Explanation of the method to prioritize a port to be implemented
iii. Explanation of the standard design model of disaster-resilient ports, cost estimation

Participants: See attached attendance sheet

Handout materials:
i. Agenda
ii. Presentation Papers

The Study Team met with the representatives of DOTC, PPA and other partner agencies on September 29, 2015 at the DOTC Headquarters in Mandaluyong City, Philippines, at 9:00. The purpose of the meeting was to explain following topics in accordance with the following agenda:

Agenda	
1. Opening Remarks	DOTC
2. Tentative Draft for Discussion on Guidelines for Selecting Social Ports in Target Area	JICA Study Team
3. Features of Transportation Through Ports in the Target Area	JICA Study Team
4. Tentative Draft for Discussion on Guidelines for Selecting Disaster Resilient Ports in Target Area	JICA Study Team
5. Tentative Draft for Discussion on Standard Design Models of Disaster Resilient Port Facilities	JICA Study Team
6. Wrap up and Closing Remarks	JICA Study Team

The meeting adjourned at 12:00.

(2) Attendance Sheet

Attendance Sheet

Venue: 16/F Unit166 Columbia Tower Ortigas Avenue, Mandaluyong City 1555 Philippines

Date: September 29, 2015

No.	Name	Organization/ Department	Position/ Title
1	ROLANDO T. RODOLFO	PPA - Manila	
2	RENATO L. YUMANG	PPA	Principal Engineer
3	ALBERT TAYABAS	PPA	Envi Specialist
4	MARCELO C. INDIC	PPA- Tacloban	Division Mananger A
5	GLENN S. LAGUNAY	PPA-Tacloban	Division Mananger A
6	ELEAZER U. PIEL	PPA, PMO Bohol	
7	TESALONICA A. BOYBOY	LGU-CP Garcia, Bohol	Municipal Mayor
8	GLENN ALAN G. BOYLES	LGU-CP Garcia, Bohol	Disaster Risk Reduction Management Officer
9	GEORMA Z. CAVERO	LGU - Hindang, Leyte	MSWDv
10	RICARDO M. RENEGADO JR	LGU - Hindang, Leyte	MPDC
11	MARIO FREDERICK D. MONTERO	LGU - Hindang, Leyte	ME
12	DEXTER R. SARCON	LGU - Hindang, Leyte	MCR
13	REINERIO A. BOGLOSA	LGU - Banate	Municipal Engineer (OIC) Engineer I
14	HONRADO M. PINEDA	DOTC- PDS	Engineer 1

Attendance Sheet

Venue: 16/F Unit166 Columbia Tower Ortigas Avenue, Mandaluyong City 1555 Philippines

Date: September 29, 2015

No.	Name	Organization/ Department	Position/ Title
15	ELENITA D. ASUNCION	DOTC-WTPD	Sr. TDO
16	BELINDA C. SALVOSA	DOTC-WTPD	Sr. TDO
17	MANNY LADIZABAL	DOTC-WTPD	Sr. CDO
18	ENRICO C. FERRE	DOTC - WTPD	Chief, WTPD
19	DENNIS M. ALBANO	DOTC - WTPD	Sr. CDO
20	MENCHIE D. BOGNALOS	DOTC - WTPD	
21	MYRA B. MEDINA	DOTC - WTPD	
22	FRANCISCO TAMPUS	DOTC - WTPD	
23	EMMA RIVERO	DOTC-WTPD	
24	ABELARDO D. SIRE JR.	DOTC	Project Manager
25	FELICISIMO PANGILINAN JR.	DOTC - Planning	OIC
26	MILKY BABILONIA	DOTC - Planning	
27	HOMER T. DE LA PAZ	DOTC - Planning	
28	SHANICA SOLLEGUE	DOTC - Planning	

Attendance Sheet

Venue: 16/F Unit166 Columbia Tower Ortigas Avenue, Mandaluyong City 1555 Philippines

Date: September 29, 2015

No.	Name	Organization/ Department	Position/ Title
29	ERNESTO CRUZ	JICA-Study Team	Civil Engineer
30	SUZANNE Z. TORRES	JICA-Study Team	
31	SHISHIDO TATSUYUKI	JICA-Study Team	Team Leader
32	SHIMADA TAKASHI	JICA-Study Team	
33	HINO ISAO	JICA-Study Team	
34	SAITO KEN	JICA-Study Team	
35			
35			
36			
37			
38			
39			
40			

(3) Presentation Materials

1) Tentative draft for Discussion on Guidelines for Selecting Social Ports in the Target Area

Screening Criteria and Guideline for Social Ports Development

On 29 & 30 Sept. 2015
JICA Study Team for
Disaster –Resilient Feeder Ports
& Logistics Network

SHIMADA/JICA * OCDI 1

Takashi SHIMADA
Principal Researcher, OCDI

- In 1981, I started working in the Ministry of Transport (MOT) in Japan as a Civil Engineer.
- I have been engaged in transport planning and engineering for more than 33 years.
- I have also taken part in overseas projects such as in Algeria, Vietnam , the Philippines and Cambodia over a 10-year period.
- In 2004, I was also a lecturer of port and airport development policy at Kobe National University.
- I took an early retirement option of Ministry of Land, Infrastructure and Transport (MLIT) and have been working in OCDI since 2014 as a principal researcher.
- Contact Add.= t-shimada@ocdi.or.jp

SHIMADA/JICA * OCDI 2

Table of Contents

SHIMADA/JICA ≈ OCDI

1. Ports in the Philippines

- Total Number of Philippine Ports= 2,035
- Public Ports= 1,612
  - Base Port & Terminal Ports = Relevant Port Authority
  - Other Governmental Ports
    - ✓ Social Port = National Fund (DoTC and Port Authority)
      Feeder Ports = Foregin Fund (DoTC), part of social ports
    - ✓ Tourism Port = Natonal Fund planned by DoT and DoTC
    - ✓ Fishing Ports = National Fund (PFDA)
- Private Ports= 423
  - Private Commercial Ports= Public Use
  - Private Non Commercial Ports= Particular Use

SHIMADA/JICA ≈ OCDI

2-1 Back Ground for Social Port Development

1. Since 1992, the DOTC has took over the development of government ports (feeder port, social port) from DPWH.
2. After this, Feeder Ports by ODA were developed based on JICA Mater Plans Studied in 2000 and 2004.
3. Social ports developed by the national government budget are mainly based on LGU request or regional political will.

SHIMADA/JICA × OCDI

2-2 Current Budgetary System to develop Social Ports

1. Management Commission by Central Government=DoTC, DA,
2. Grant Budget by Central Government
3. IRA(Internal Revenue Allotment)=80%Project Cost
4. Funding Assistance=Budget Shear between Authority and LGU. Auditor' check for Specification and Financial Aspects is required
5. Invested fully by LGU= Highly Urbanized City
6. PPP or BOT

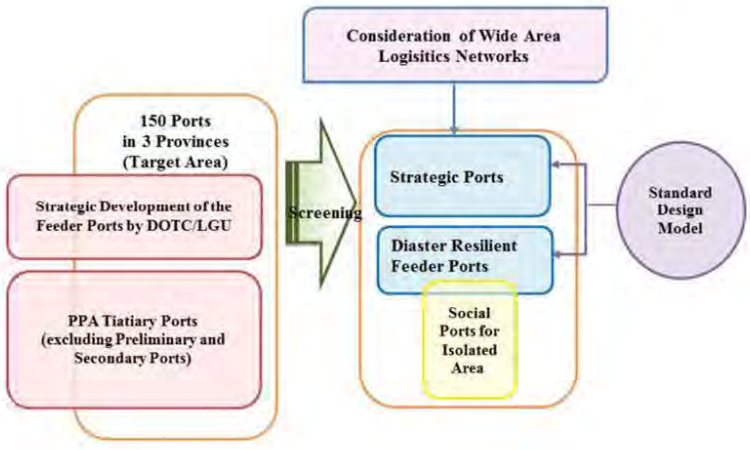
SHIMADA/JICA × OCDI

2-3 Current Issues for Social Port Management

1. LGU should assign 8 staffs to manage social port by Local Law or Ordinance for collection of fees and safety management. But the management social port is not effective. Sometimes, social port facilities are abandoned and have not been utilized anymore.
2. Maintenance of port including other infrastructure is the last priority in LGU Budget.
3. LGU should be responsible for daily maintenance. On the other hand, the responsibility or burden share for large scale repair is not clearly.
4. Registration book on which social port facilities are listed, does not actually exist. Property management is not done appropriately.
5. Engineers in LGUs are mainly specialized to road and river engineering, but not familiar to port engineering. Sometimes, they request ports in inappropriate sites without considering natural conditions.
6. There is duplication or institutional conflicts among the relevant agencies.

SHIMADA/JICA * OCDI 7

3-1 Study Scope of Feeder Port System for Disaster Resilient and Isolated Area



SHIMADA/JICA * OCDI 8

3-2 Target Area and Major Ports

3 provinces, Iloilo, Bohol and Leyte

Around 142 Public Ports in the target area
Excluding Cebu and Negros

Legend
- Existing Ro-Ro Terminal (☆Base Key City Ro-Ro Terminal)
- On-going Ro-Ro Terminal Development
- Terminal Port
- CY2015 Social and Tourism ports development project

	Population			Area	Density
	1990	2000	2010	Km2	per Km2
Iloilo (excluding Iloilo City)	1,337,981	1,559,182	1,805,576	5,079.17	439.1
Iloilo City	309,505	366,391	424,619		
Bohol	948,403	1,139,130	1,255,128	4,820.96	260.3
Leyte (excluding Tacloban City)	1,230,925	1,413,697	1,567,984	6,515.05	274.6
Tacloban City	136,891	178,639	221,174		

SHIMADA/JICA * OCDI 9

3-3 Current Situation of Ports Development in Target Area

Classification	Symbol	Iloilo Prov.	Bohol Prov.	Leyte Prov.	Total
Population 2010 (,000)		**2,230**	**1,255**	**1,789**	**5,274**
Private	●	**10**	**6**	**10**	**26**
Base / Terminal	●	3	6	5	14
Social	●	21	68	39	128
Public Total		**24**	**74**	**44**	**142**
One Port /50,000 per Dev. Ratio		45 (0.53)	25 (2.96)	35 (1.26)	105 (1.35)
One Port in Municipality In the Coast		18 (1.33)	29 (3.00)	32 (1.38)	89 (1.59)

SHIMADA/JICA * OCDI 10

3-4 Ports in Target Area (1)

SHIMADA/JICA * OCDI 11

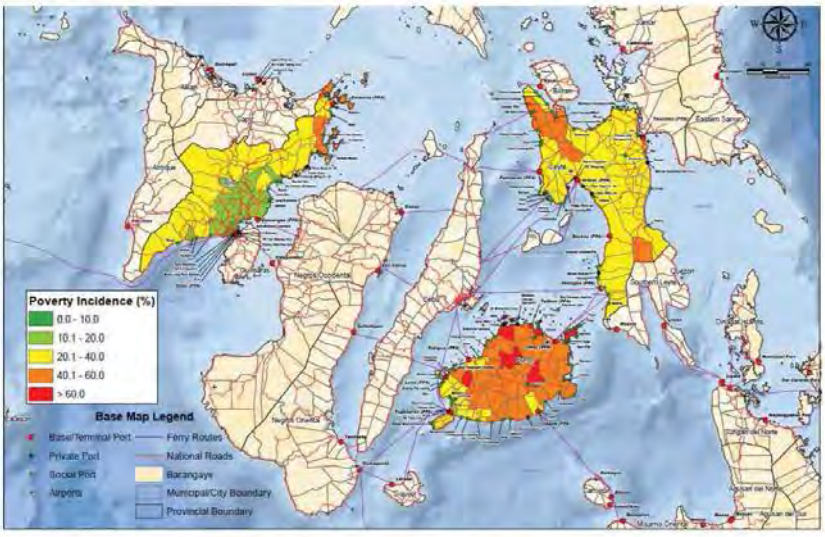
3-5 Ports in Target Area (2)

SHIMADA/JICA * OCDI 12

3-6 Ports and Population Distribution

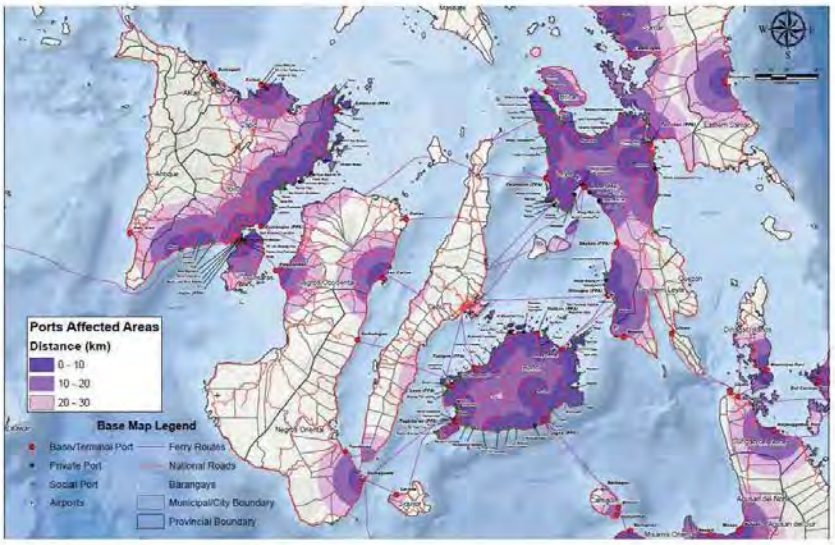
SHIMADA/JICA * OCDI 13

3-7 Ports and Poverty Incidence



SHIMADA/JICA * OCDI 14

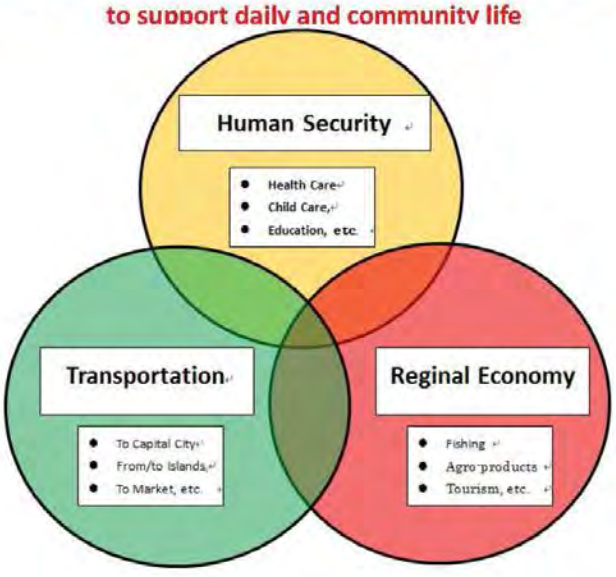
3-8 Ports Density



SHIMADA/JICA * OCDI 15

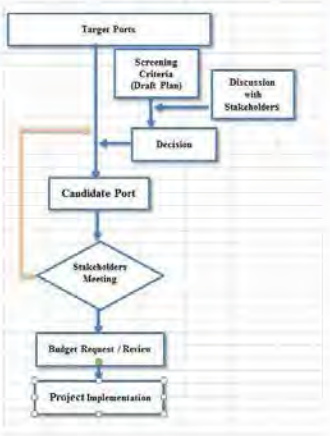
3-9 Basic Roles of Social Port

to support daily and community life



SHIMADA/JICA * OCDI 16

3-10 Screening Flow for Investment for Social Ports



Preliminary Screening by Simple Criteria

- ✓ **Municipality and DoTC Discussion**

Secondary Screening by Detail Criteria

- ✓ **DoTC Official Meeting**
- ✓ **Other Opinion Relevant Authorities**
- ✓ **Provincial Development Committee**

SHIMADA/JICA + OCDI 17

3-11
5 Criteria for Preliminary Screening

1. Number of Public Ports in Municipality (0 or 1) is prioritized.
2. Municipality Income Level Grade 1 should be excluded.
3. No Investment by DOTC and PPA during latest 3 years
4. No ODA investment in the past
5. Poverty incidence (More than 30%)

SHIMADA/JICA + OCDI 18

3-12 9 Secondary Criteria to Prioritize considering Area Characteristics

Red marks are absolute Requirements

1. Distance to Neighbor Port (more than 10km)
2. Distance from NHW (more than 20 km)
3. Purpose of Investment (Connection to/ from Isolated Island is prioritized)
4. Distance to Provencal Capital (more than 50km is prioritized)
5. Water depth (more than 4m above MSL)
6. Project site is not in a preserved/protected area (DENR definition) to ensure minimal impact to marine environment.
7. LGU has the right of way and land ownership of the project site
8. LGU has the commitment allocate budget to operate and maintain the port
9. Community organization has been established for the port operation and maintenance (e.g. port manager, port tariff collecting personnel)

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4-1 Trial for Screening of Bohol Ports

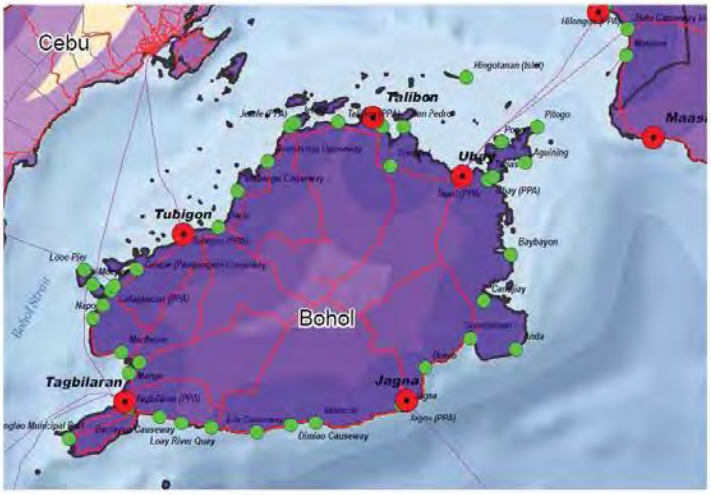
Name of Port / Company	Location (Municipality)	NSPDP 1)	SRRFPD P2)	Local Fund 3)	Rehab DOT C	Rehab PPA	O&M	Population of Municipality		Income classification of Municipality	Poverty Incidence of Municipality
								(2000)	Ratio	(2010)	(2012)

SHIMADA/JICA * OCDI 20

4-2 Ports in Bohol Province

SHIMADA/JICA * OCDI 21

4-3 Distance between Neighbor Ports
10km, 20km, 30km

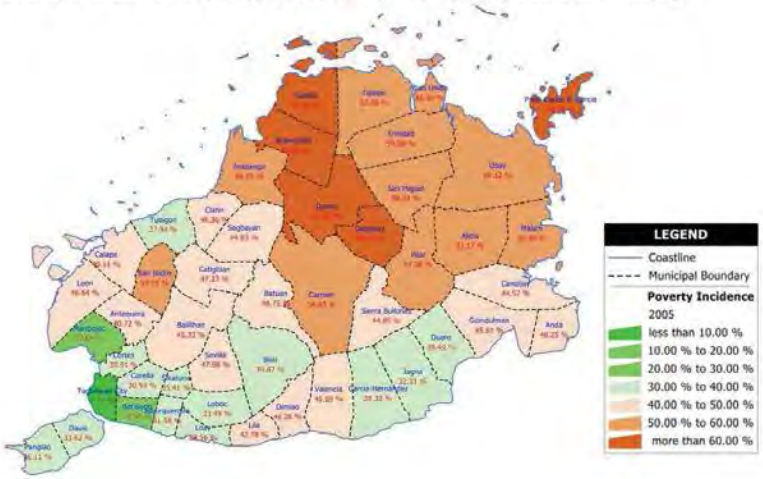


SHIMADA/JICA * OCDI 22

4-4 Poverty Indicator in Bohol

Source; PPDO Bohol

Poverty Indicator in Jetafe, Buenavista, and Laping Island are strong.



SHIMADA/JICA＊OCDI 23

4-5 Mangrove Forest in Bohol

Source; PPDO Bohol

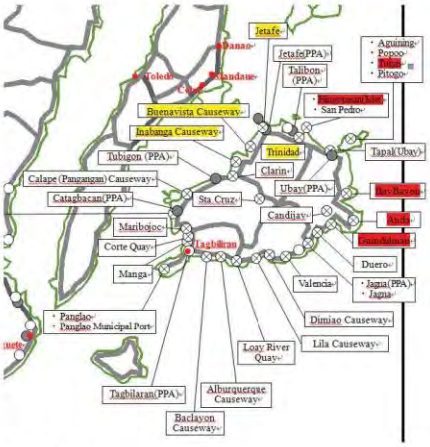
Mangrove forests exist in northern area.
particularly, Bayan, Unido and Mabini

SHIMADA/JICA＊OCDI 24

4-6 Result of Trial Screening in Bohol

9 ports are screened out and 4 ports are prioritized by secondary criteria.

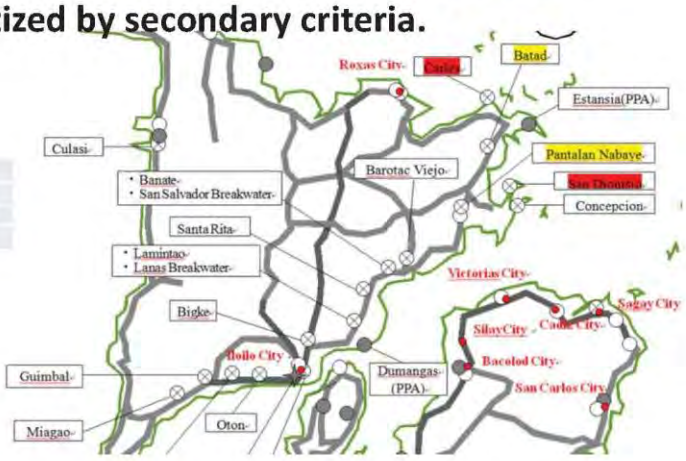
Inabanga Causeway	Inabanga
Buenavista Causeway	Buenavista
Jetafe	Jetafe
Trinidad	Trinidad
Hingotanan (Islet)	Bien Unido
Tugas	Pres. Carlos Garcia
Baybayon	Mabini
Anda	Anda
Guindulman	Guindulman



5-1 Result of Trial Screening in Iloilo

4 ports are screened out and 2 ports are prioritized by secondary criteria.

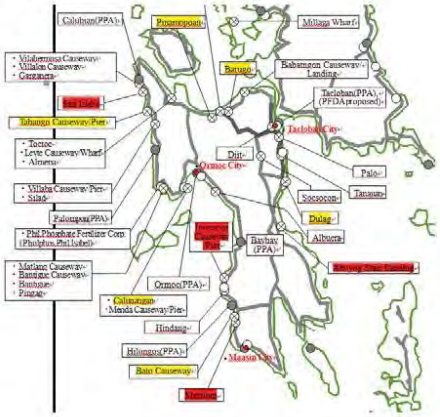
Carles	Carles
Batad	Batad
San Dionisio	San Dionisio
Pantalan Nabaye	Ajuy



5-2 Result of Trial Screening in Leyte

11 ports are screened out and 4 ports are prioritized by secondary criteria.

Pinamopoan	Capoocan
Barugo	Barugo
Dulag	Dulag
Abuyog Stair Landing	Abuyog
San Isidro	San Isidro
Tabango Causeway/Pier	Tabango
Calunangan	Merida
Inopacan Causeway/Pier	Inopacan
Bato Causeway, Iniguihan	Bato
Matalom	Matalom
Carigara Causeway/Pier	Carigara



6. Important Points

1. One social port is developed in one municipality basically . To develop more than one port should be examined well.
2. High urbanized cities develop social ports by themselves.
3. Low income municipalities and high poverty areas are prioritized.
4. Ports connecting to islands are prioritized.
5. Social ports that were invested by Gov. and PPA in the past, are carefully examined if LGUs manage it well or not.
6. Port facility register book should be justified by PMB and facility owner .
7. LGUs engineer should be upgrade the capability for port development, maintenance and management.

2) Features of Transportation Through Ports in the Target Area

Features of transportation through ports in the target area

- Contents -

1. The specification of target ports
2. The cargo flow of target ports
3. The logistics network in target area
4. Handling of "Fuel and By-products"
5. Finding

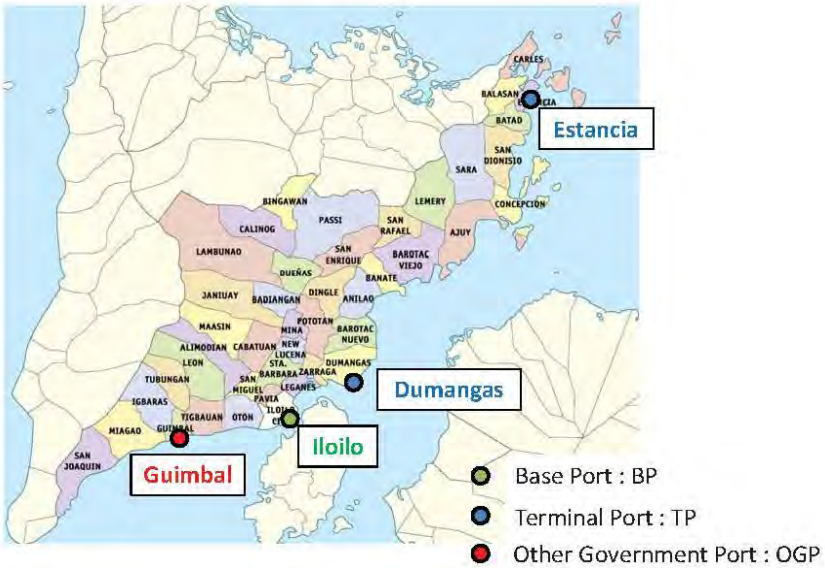
Source

1. Annual Port Statistics Data (PPA) CY 2012, 2013, 2014
   http://www.ppa.com.ph/ppa%20web/portstat.htm
2. Monthly Port Statistics Data (PPA) CY2014
   PMO-Iloilo, PMO-Tagbilaran, PMO-Ormoc/ Tacloban

1

1. The specification of target ports

1-1. ILOILO : PMO-Iloilo



2

1. The specification of target ports

Total Cargo Throughput (CY2014)

Domestic (Inbound/Outbound)

	Name of Ports		Vol. of Cargo(m.t)	
1	Iloilo	BP	2,621,697	A
2	Bulk Cement	Priv.	147,723	
3	Petron	Priv.	127,002	
4	Milagrosa	Priv.	48,539	
5	Dumangas	OGP	38,199	B
	.....			
		Total	3,021,511	C

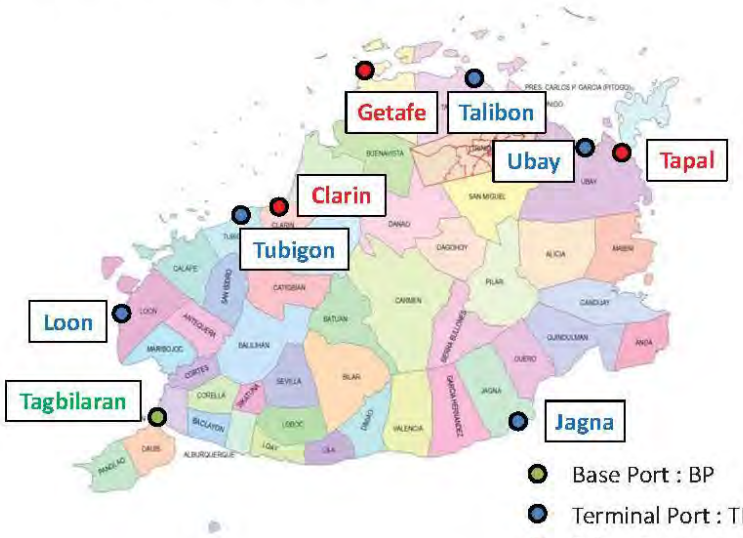
Iloilo (BP) / Dumangas = A / B = x 68.6

Iloilo (BP) / Total = A / C = 86.7%

3

1. The specification of target ports

1-2. BOHOL : PMO-Tagbilaran



4

1. The specification of target ports

Total Cargo Throughput (CY2014)

Domestic (Inbound/Outbound)

	Name of Ports		Vol. of Cargo(m.t)	
1	Tagbilaran	BP	1,286,778	A
2	Tubigon	TP	114,475	B
3	Ubay	TP	100,530	
4	Tapal	OGP	80,608	
5	Jagna	TP	74,452	
	.....			
		Total	3,008,883	C

Tagbilaran (BP) / Tubigon = A / B = x 11.2

Tagbilaran (BP) / Total = A / C = 42.8%

5

1. The specification of target ports

1-3. LEYTE : PMO-Ormoc/Tacloban

6

1. The specification of target ports

Total Cargo Throughput (CY2014)

Domestic (Inbound/Outbound)

	Name of Ports		Vol. of Cargo(m.t)	
1	Tacloban (TAC)	BP	741,956	A
2	Ormoc (ORM)	BP	440,862	
3	Pasar (ORM)	Priv.	348,156	
4	Philphos (ORM)	Priv.	224,798	
5	Bato (ORM)	OGP	171,045	B
	.....			
		Total	2,708,238	C

Ormoc+Tacloban (BP) / Bato = A / B = x 6.9

Ormoc+Tacloban (BP) / Total = A / B = 43.7%

PMO - Ormoc : ORM

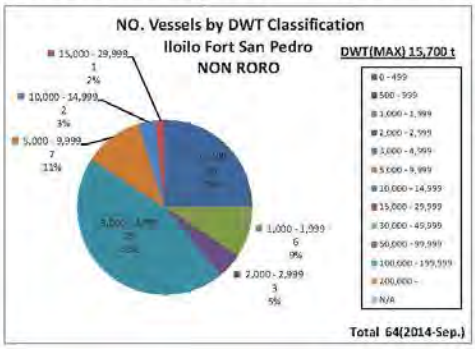
PMO - Tacloban : TAC

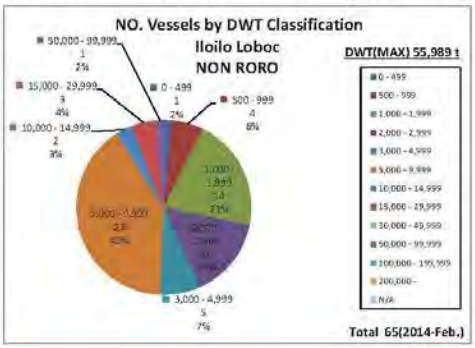
7

1. The specification of target ports

1-4. Iloilo (BP) : Iloilo

No. Vessels by DWT Classification and Draft (2014-Sep./Feb.)





	Draft (m)	
	Arrival	Depature
Average	4.76	4.27
Max	7.35	7.30

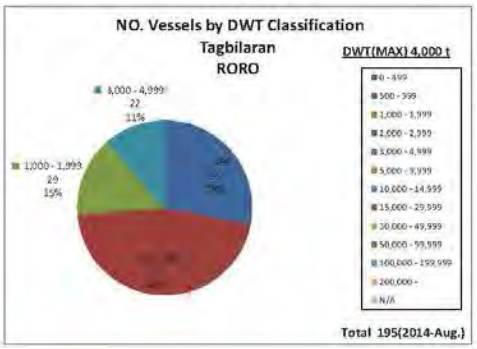
	Draft (m)	
	Arrival	Depature
Average	4.88	4.06
Max	6.66	6.70

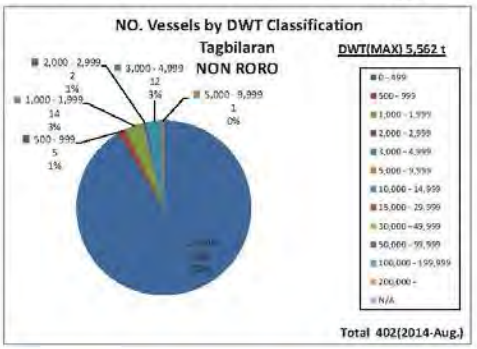
8

1. The specification of target ports

1-5. Tagbilaran (BP) : Bohol

No. Vessels by DWT Classification and Draft (2014-Aug.)





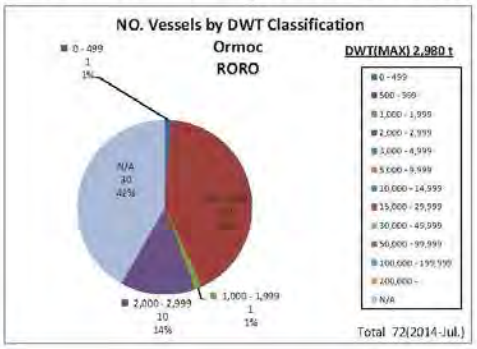
	Draft (m)	
	Arrival	Depature
Average	2.49	2.37
Max	9.00	4.40

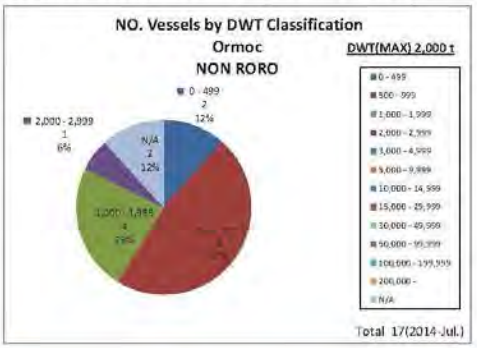
	Draft (m)	
	Arrival	Depature
Average	1.86	1.81
Max	6.20	7.00

1. The specification of target ports

1-6. Ormoc (BP) : Leyte

No. Vessels by DWT Classification and Draft (2014-Jul.)





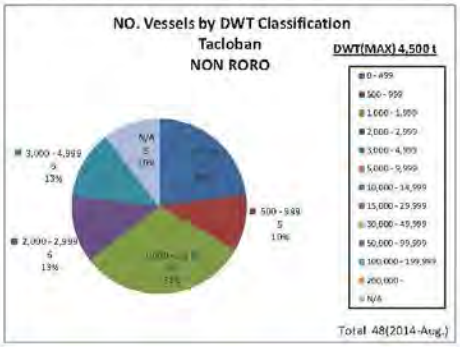
	Draft (m)	
	Arrival	Depature
Average	3.53	3.37
Max	5.50	5.00

	Draft (m)	
	Arrival	Depature
Average	3.16	1.81
Max	4.90	4.20

1. The specification of target ports

1-7. Tacloban (BP) : Leyte

No. Vessels by DWT Classification and Draft (2014-Aug.)



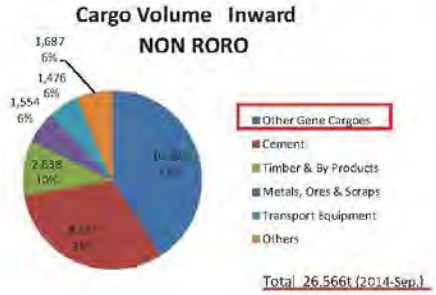
	Draft (m)	
	Arrival	Depature
Average	4.22	2.98
Max	11.00	5.50

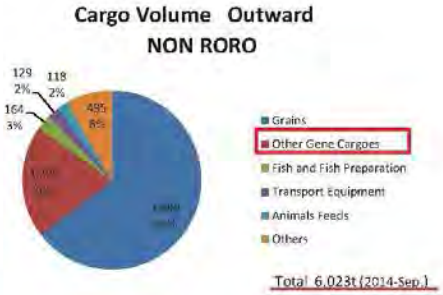
2. The cargo flow of target ports

2-1. Iloilo - FORT SAN PEDRO (BP) : Iloilo

Monthly Cargo Volume (2014-Sep.)

FORT SAN PEDRO





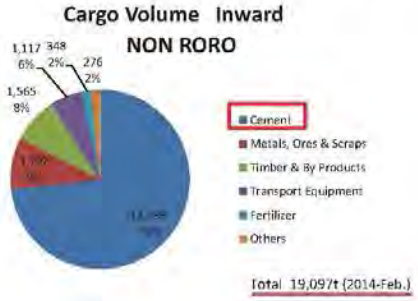
- In each case, the share of "Other Gene. Cargo" ranges between 20% and 30%

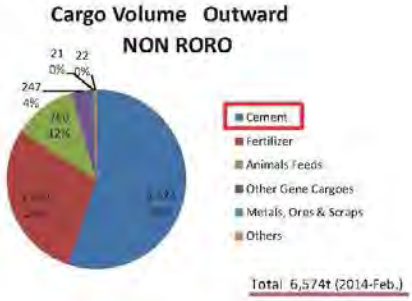
2. The cargo flow of target ports

2-2. Iloilo – Loboc (BP) : Iloilo

Monthly Cargo Volume (2014-Feb.)

Iloilo Commercial Port Complex-Loboc



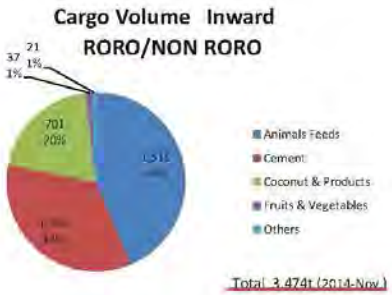


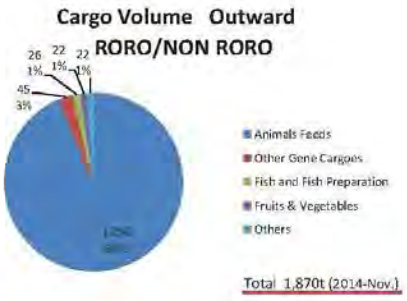
- In each case, the share of "Cement" is over 50%

2. The cargo flow of target ports

2-3. Dumangas (TP) : Iloilo

Monthly Cargo Volume (2014-Nov.)





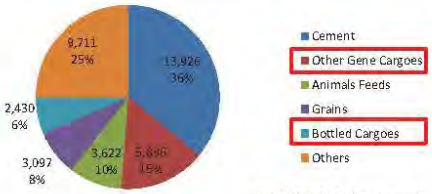
- A large share of items is handled by NON RORO (4vessels)
  Inward : RORO 59 t, NON RORO 3,415 t
  Outward : RORO 115 t, NONO RORO 1,755 t

2. The cargo flow of target ports

2-4. Tagbilaran (TP) : Bohol

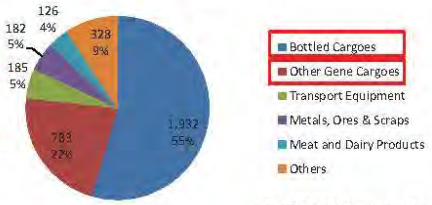
Monthly Cargo Volume (2014-Aug.)

Cargo Volume Inward RORO/NON RORO



Total 38,682t (2014-Aug.)

Cargo Volume Outward RORO/NON RORO



Total 3,536t (2014-Aug.)

- In each case, the share of "Other Gene. Cargo" is significant
- Outward: The share of "Bottled Cargoes" is over 50%

15

2. The cargo flow of target ports

2-5. Talibon, Tubigon, Clarin, Getafe : Bohol

16

2. The cargo flow of target ports

Number of Vessels – monthly (2014-Mar.)

		No Vessels Total	No Vessels (Cebu - Cebu)
Tubigon (TP)	RORO	185	185
	NON RORO	469	466
Crarin (OGP)	NON RORO	12	12
Getafe (OGP)	NON RORO	389	389
Talibon (TP)	RORO	29	29
	NON RORO	65	64

- Cebu is a significant logistics hub in the northern part of Bohol

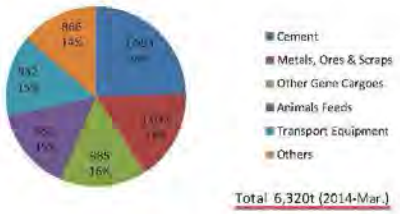
17

2. The cargo flow of target ports

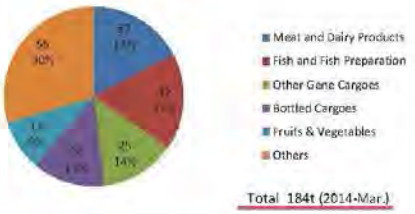
Monthly Cargo Volume (2014-Mar.)

RORO (Cebu-4 ports-Cebu)

Cargo Volume Inward RORO



Cargo Volume Outward RORO



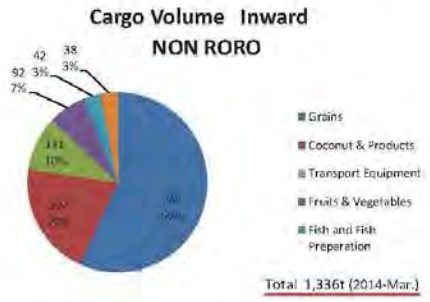
- Inward: Industrial materials make up a significant share of the total
- Outward: Food products account for a significant share of the total
- Inward / Outward = 6,320t / 184t=34.3

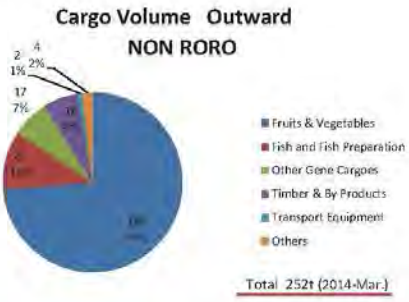
18

2. The cargo flow of target ports

Monthly Cargo Volume (2014-Mar.)

NON RORO (Cebu-4 ports-Cebu)



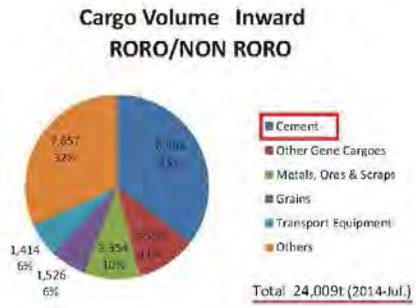


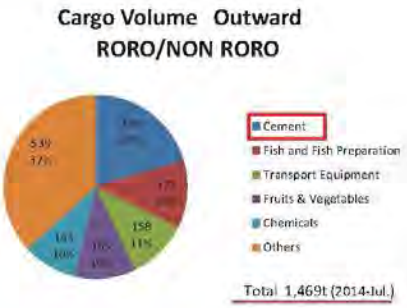
- In each case, food products make up a significant share of the total
- Inward / Outward = 1,336t / 252t=5.3

2. The cargo flow of target ports

2-6. Ormoc (BP) : Leyte

Monthly Cargo Volume (2014-Jul.)



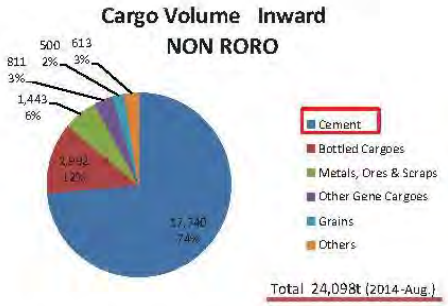


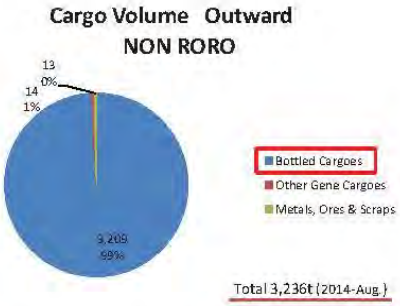
- In each case, the share of "Cement" is significant
- Inward / Outward = 24,009t / 1,469t=16.3

2. The cargo flow of target ports

2-7. Tacloban (BP) : Leyte

Monthly Cargo Volume (2014-Aug.)





- Inward: The share of "Cement" materials is significant
- Outward: "Bottled Cargoes" account for almost 100% of the total

21

2. The cargo flow of target ports

2-8. Hilongos (TP) : Leyte

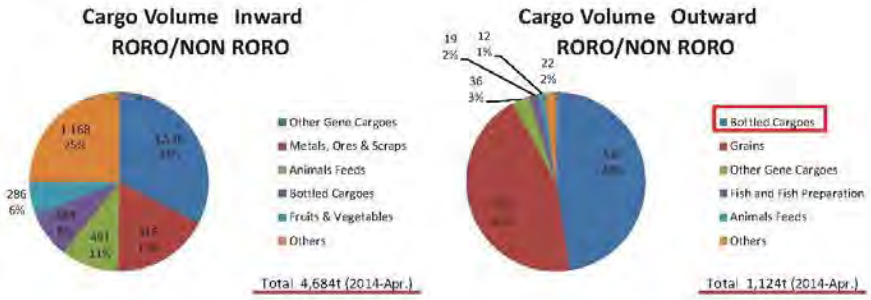
Number of Vessels (2014-Apr.)

	No Vessels Total	Ship Call (Last-Next)	No Vessels
RORO	54	Cebu-Cebu	54 (100%)
NON RORO	23	Cebu-Cebu	23 (100%)

22

2. The cargo flow of target ports

Monthly Cargo Volume (2014-Apr.)



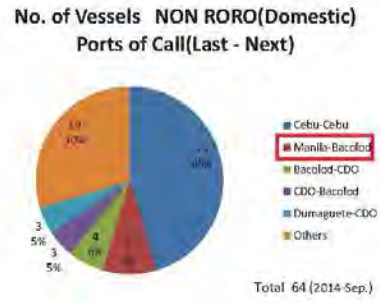
- Outward: "Bottled Cargoes" and "Grains" account for over 90% of total cargoes

3. The logistics network in target area

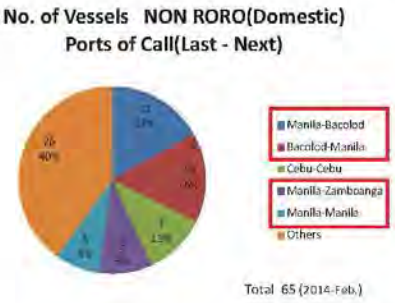
3-1. Iloilo (BP) : Iloilo

Number of Vessels (2014-Sep./Feb.)

FORT SAN PEDRO



Iloilo Commercial Port Complex-Loboc



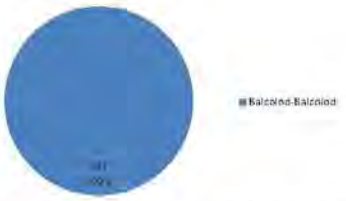
- Some NON RORO vessels are in service between long-distance ports (e.g. Manila, Zamboanga)

3. The logistics network in target area

3-2. Dumangas (TP) : Iloilo

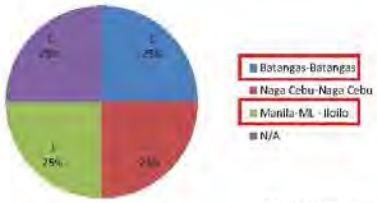
Number of Vessels (2014-Nov.)

No. of Vessels RORO(Domestic)
Ports of Call(Last - Next)



Total 627 (2014-Nov.)

No. of Vessels NON RORO(Domestic)
Ports of Call(Last - Next)



Total 4 (2014-Nov.)

- All RORO vessels go into service between Balcolod
- Some NON RORO vessels go into service between long-distance ports (e.g. Manila, Batangas)

25

3. The logistics network in target area

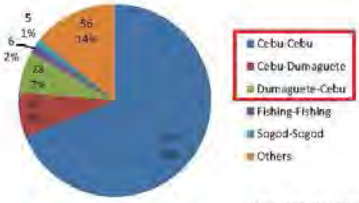
3-3. Tagbilaran (TP) : Bohol

Number of Vessels (2014-Aug.)

No. of Vessels RORO(Domestic)
Ports of Call(Last - Next)

Total 195 (2014-Aug.)

No. of Vessels NON RORO(Domestic)
Ports of Call(Last - Next)



Total 402 (2014-Aug.)

- In each case, many vessels are engaged in services that link with Cebu

26

3. The logistics network in target area

3-4. Tapal (OGP) : Bohol

Comparison of Cargo Volume per Vessel

		Tapal(OGP)	Ubay(TP)	Tagbilaran(BP)
2014	a. No. Vessels	90	2,952	7,362
	b. Cargo Vol.	80,608 t	100,530 t	1,286,778 t
	b / a	**895.6 t**	**34.1 t**	**174.8 t**
2012	a. No. Vessels	185	2,437	6,376
	b. Cargo Vol.	131,103 t	31,552 t	1,142,671 t
	b / a	**708.7 t**	**12.9 t**	**179.2 t**
2013	a. No. Vessels	197	2,626	6,776
	b. Cargo Vol.	721,254 t	42,323 t	1,142,671 t
	b / a	**3,661.2 t**	**16.1 t**	**168.6 t**

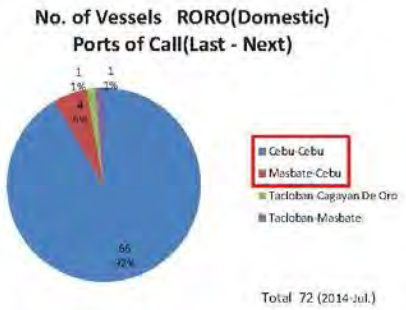
- Cargo volume per vessel of Tapal is large compare to the other ports

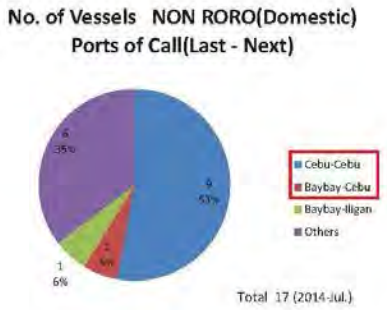
27

3. The logistics network in target area

3-5. Ormoc (BP) : Leyte

Number of Vessels (2014-Jul.)





- In each case, many vessels are engaged in services that link with Cebu

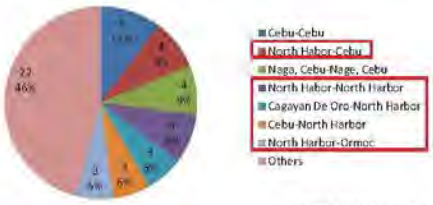
28

3. The logistics network in target area

3-6. Tacloban (BP) : Leyte

Number of Vessels (2014-Aug.)

No. of Vessels NON RORO(Domestic)
Ports of Call(Last - Next)



Total 48 (2014-Aug.)

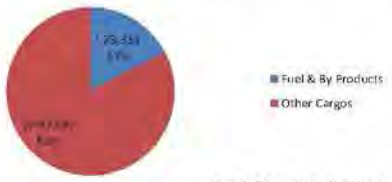
- Sea lanes are dispersed in Visayas and beyond
- Some NON RORO vessels are in service between long-distance ports (e.g. Manila)

29

4. Handling of "Fuel and By-products"

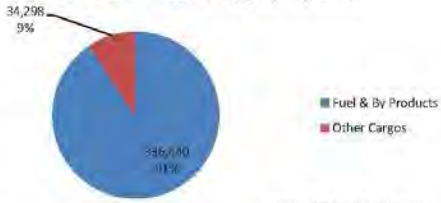
4-1. ILOILO LOBOC, PRYSE GASES (Priv.): PMO-Iloilo

Cargo Volume(2014)
PMO:ILOILO, Domestic(Inbound)



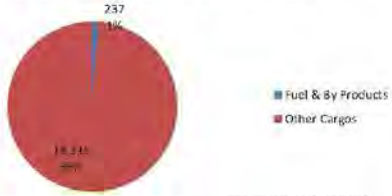
Total 3,021,511t (CY2014)

Cargo Volume(2014)
PMO:ILOILO, Foreign(Import)



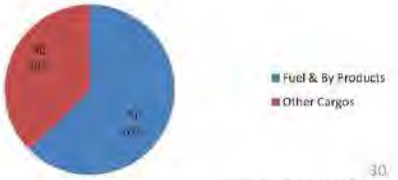
Total 370,738t (CY2014)

Number of Vessels(2014)
PMO:ILOILO, Domestic(Inbound)



Total 18,552 (CY2014)

Number of Vessels(2014)
PMO:ILOILO, Foreign(Import)



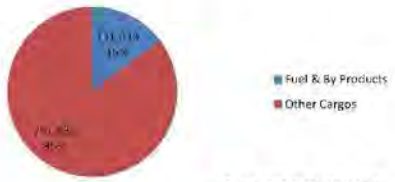
Total 80 (CY2014)

30

4. Handling of "Fuel and By-products"

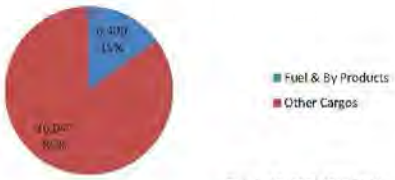
4-2. SHELL ANIBONG, PETRON, SUPREME STAR OIL (Priv.): PMO-Tacloban

Cargo Volume(2014)
PMO:TACLOBAN, Domestic(Inbound)



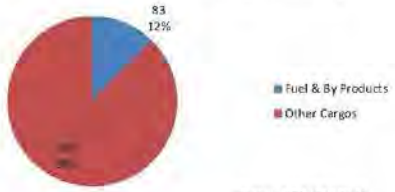
Total 882,843t (CY2014)

Cargo Volume(2014)
PMO:TACLOBAN, Foreign(Import)



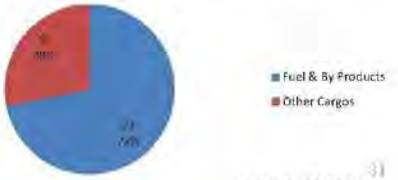
Total 42,447t (CY2014)

Number of Vessels(2014)
PMO:TACLOBAN, Domestic(Inbound)



Total 672 (CY2014)

Number of Vessels(2014)
PMO:TACLOBAN, Foreign(Import)



Total 32 (CY2014)

5. Finding

Finding-1

1. The specification of target ports

- There are one or two representative ports (BP) in each province
- The share (BP) of total cargo throughput in each province is as below;

  Iloilo 86.7%, Bohol 42.8%, Leyte 43.7%
- The cargo volume of each BP is much larger than total cargo volume of the other ports (TP, OGP) in province

  Iloilo x 68.6, Bohol x11.2, Leyte x6.9

5. Finding

Finding-2

2. The cargo flow of target ports

- Many cargoes are biased toward inbound, especially from Cebu
- Many cargoes are concentrated at Iloilo port in Iloilo Provinces
- Bohol Provinces receive a large volume of Cement and Other General Cargo from Cebu
- Ormoc Port and Tacloban Port handle a large proportion of cargo in Leyte Provinces

5. Finding

Finding-3

3. The logistics network in the target area

- Cebu is a significant logistics hub in Visayas
- Base Ports (Iloilo, Tagbilaran, Tacloban) in addition to Tapal Port (OGP) handle the cargo from extra-regional ports (e.g. Manila, Batangas)

5. Finding

Finding-4

4. Handling of "Fuel and By-products"

- Fuel and By-products are unloaded at private ports (which is listed in the column of "Private port" and "PMO Iloilo or PMO Tacloban" in PPA Statistics)
- It occupies around 90% of imported volume at Iloilo Port

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Thanks for your attention!

JICA Study Team

The Overseas Coastal Area Development Institute of Japan

Oriental Consultants Global Co., Ltd.

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3) Tentative Draft for Discussion on Guidelines for Selecting Disaster Resilient Ports in Target Area

Department of Transportation and Communications (DOTC)

Japan International Cooperation Agency (JICA)

Seminar on Disaster-resilient Feeder Ports and Logistics Network in the Republic of the Philippines

Guidelines for Selection of Disaster Resilient Ports

1. Disaster Resilient Port
2. Selecting Disaster Resilient Ports
3. Guideline

Sept. 29 2015

Tatsuyuki SHISHIDO
JICA survey team

1

Disaster Resilient Port

A port which can:

maintain minimum port function;
contribute to form logistics networks; and
support disaster management activities

in case a natural disaster hits the port and/or its surrounding area.

2

Requirement for a Disaster Resilient Port

- To support livelihoods and industry in damaged areas by providing port service early
  Livelihoods/industrial activity support function
- To play a role as hub of cargo transportation and passenger traffic
  Logistics function
- To contribute in forming alternative routes when land transportation routes are damaged
  Bypass function
- To provide space for disaster management activities immediately after a disaster
  Space-providing function

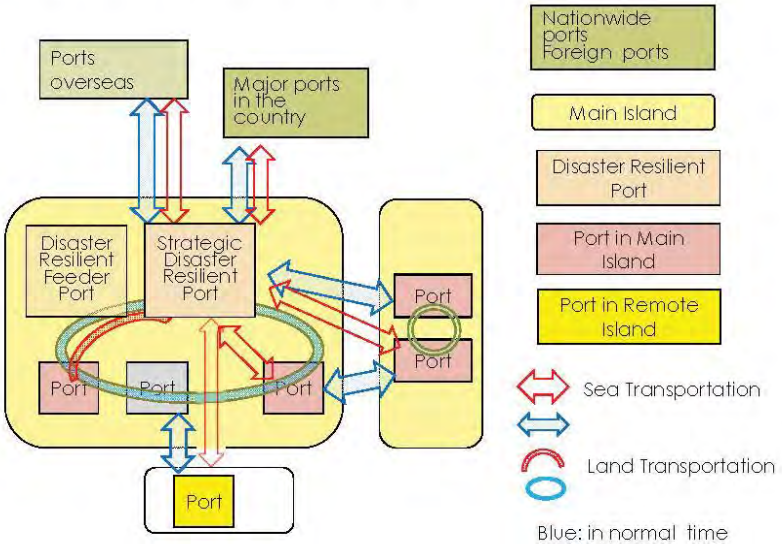
3

Basic Policy for the improvement of Disaster Resilient Ports

- One disaster resilient port shall be deployed in each province <**Strategic Disaster Resilient Port**>
- Port(s) other than the strategic disaster resilient port shall be enhanced against disasters according to importance from the viewpoint of disaster resilience. Number of the ports shall be decided considering population and economic activities in the Province. <**Disaster Resilient Feeder Port**>
- Small ports located along coastal lines and not damaged seriously may receive goods or persons transported by small boats from disaster resilient ports
- Relation to the ports in neighboring provinces shall be taken into consideration.

4

Image of Ports and Port Networks



5

Ports to be considered in the Target Area

Iloilo Province	1)	2)
Iloilo Port	PMO(BP)	BP
Dumangas Port	Under TMO	OGP
Estancia Port	Under TMO	TP
Guimbal Port	Under TMO	OGP

Bohol Province	1)	2)
Tagbilaran Port	PMO(BP)	BP
Tubigon Port	Under TMO	TP
Jetafe Port	Under TMO	TP
Tabilon Port	Under TMO	TP
Ubay Port	Under TMO	TP
Jagna Port	Under TMO	TP
Tapal Port	Under TMO	OGP
Loay Port	Under TMO	OGP

Leyte Province	1)	2)
Tacloban Port	PMO(BP)	BP
Ormoc Port	PMO(BP)	BP
Palampon Port	Under TMO	TP
San Isdro Port	Under TMO	TP
Baybay port	Under TMO	TP
Hlongos Port	Under TMO	TP
Isabel Port	Under TMO	OGP
Bato Port		OGP

1) PPA materials
2) PPA statistics

6

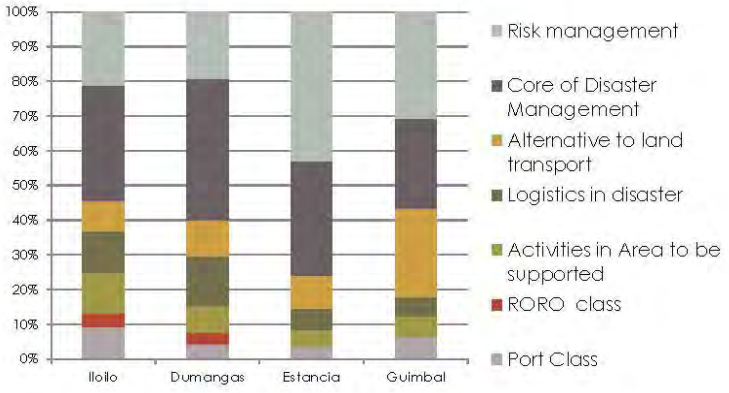
Method of Calculating the Degree of Importance

Logistics	0.1		
Port Class	0.8	Masterplan study in 2004	
RORO class	0.2	Masterplan study in 2004	
Disaster Resilient	0.9		
Activities in Area to be supported		Population of municipality	
	0.10	Cargo volume	
Logistics in disaster	0.10	Route from/to nationwide or foreign ports	
		RORO Service Frequency	
		Road in the Vicinity	
Alternative to land transport	0.10	Ports in the Province	
		Traffic of Coastal Road behind the Port	
Core of Disaster Management	0.35	Maximum depth of Berth	
		Area of Port	
		Port Management	
		Location at Disaster Management Center	
		Building in the port area	
Risk management	0.35	Degree of Disaster Risk	
		Existence of Alternative Ports	
		Location from the Representative Port	

7

Numerical results -Ports in Iloilo Province

Iloilo	Dumangas	Estancia	Guimbal
8	4	5	3



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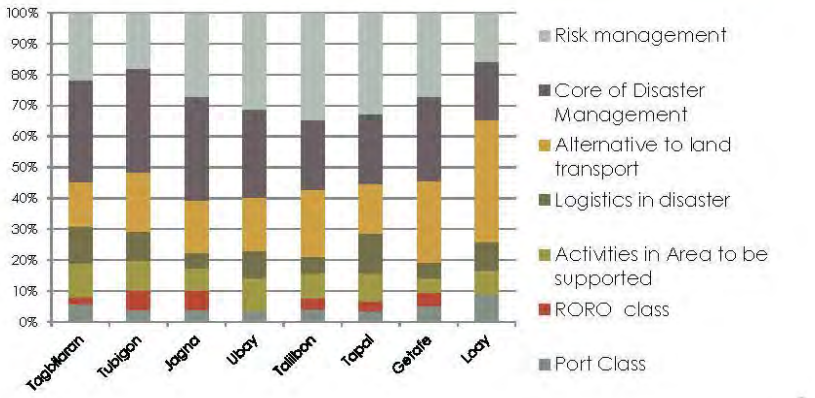
Numerical Results -Ports in Bohol Province

Tagbilaran	Tubigon	Jagna	Ubay	Talibon	Tapal	Getafe	Loay
6	5	5	5	4	5	3	3

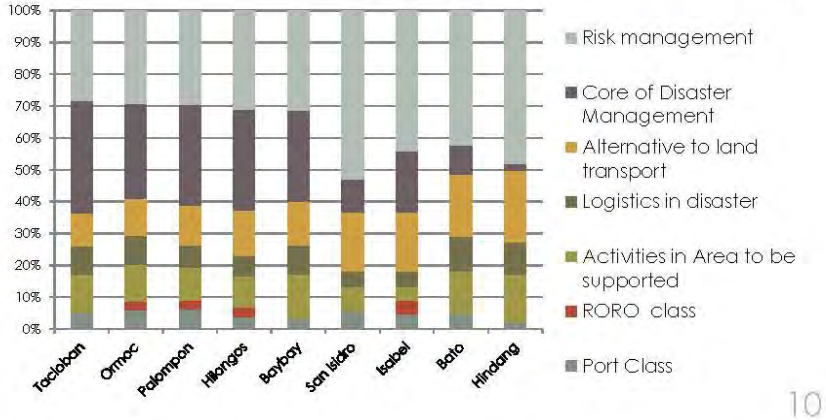


9

Numerical Results -Ports in Leyte Province

Tacloban	Ormoc	Palompon	Hilongos	Baybay	San Isidro	Isabel	Bato*)
7	6	5	5	5	4	3	3

*) data on several items could not be obtained



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Assessing the Numerical Results

Prov.	Strategic Disaster Resilient Port	Candidate Disaster Resilient Feeder Port	Points in assessing the numerical result
Iloilo	**Iloilo**	**Estancia**	Relation to neighboring Prov.
Bohol	**Tagbilaran**	**Tapal**, Jagna Ubay, Tubigon	Investment cost Natural conditions Location
Leyte	**Tacloban**	**Ormoc**	Location (west/East)

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Draft Skelton of Guidelines

1. Introduction
   Role of ports in time of disaster
   Damages caused by disasters
2. Evaluation of the degree of importance
2-1 Preliminary selection of Target Ports
   Calculation of the degree of importance
2-2 Assessing Numerical Results
   Engineering aspect
   Economic/financial aspect
   Social/Environmental aspect
3. Coordination with stakeholders
3.1 Port users and related persons
3.2 Relevant agencies
3.3 Designation of Disaster Resilient Ports

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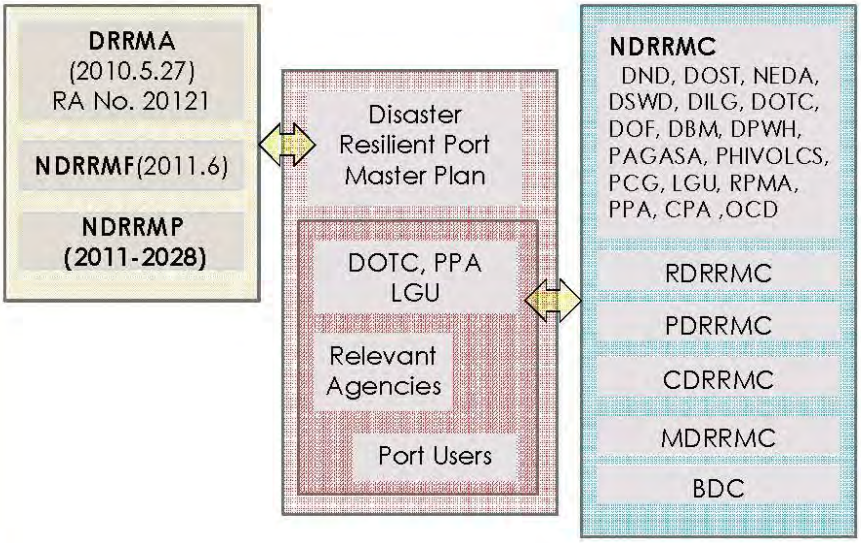
Consistency with Government Policy



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Build Back Better

Thanks for Your Attention

14

4) Tentative Draft for Discussion on Standard Design Models of Disaster Resilient Port Facilities

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

Results of Field Survey and Standard Design Model of Disaster Resilient Ports

29 September 2015

JICA Survey Team

1

Summary of the Investigation of Port Facilities in Leyte Area

Port Facilities	Unit	TACLOBAN	PALOMPON	ISABEL	ORMOC	BAYBAY	HILONGOS	BATO	BABATUGON
Cargo Berthing length (depth, m)	m	922 (10.0m)	235, (6.78 m)	84 (3.0 m)	793(5.91 m) 10 berths	428.2 (3.98 m) 5 berths	375 (3.19 m) 5 berths	150 3 berths	None
Degree of damage		Flood only							
RORO Facilities	Unit	2	1	None	3	1	2	1	None
Total port area	m^2	45,000	18,399	2,106	18,132	7,997	14,119	1,800	None
Working area	m^2	7,756				None	574		
Open Storage	m^2	6,553	8,297	-	4,733	834	6,944	900	None
Warehouse or Transit shed	m^2	540.00	675	-					None
Degree of damage		Transit shed, small buldgs and 1 crane totally damaged	Roof, ceiling damage						
Marshalling Area	m^2	-	1,814	-	1,373	540	558	None	None
Vehicle Parking Areas	m^2	-	1,240	-	3,337, (61 vehicles)	45, (12 vehicles)	132	None	None
Passenger Terminal Building	m^2	-	150	None	1,412	315	271	None	None
Degree of damage			Roof, ceiling damage			Roof, ceiling damage	Roof, ceiling damage		
Admin Bldg, etc	m^2	686 x 3 stories	166	104	281	58	58	None	None
Degree of damage		Totally Damaged	Roof, ceiling damage		PMO and othe bldgs damaged				
Degree of total damage		Serious damage	Midium Damage	Very Minor	Midium Damage	Minor Damage	Minor Damage	Very Minor	None
Rehabilitated date, cost(mil. Peso)		2014/12/30, (25.9)	2015/3/31, (5.6)		2014/12/30, (4.0)	2014/3/14, (1.5)	2014/3/14, (2.1)		

Tacloban Port

Damaged Conditions by Typhoon Yolanda	 PPA	 PPA	  PPA
	Totally damaged warehouse by 5.2 meter storm surge of typhoon Yolanda but the column structure was not damaged.	Inside view of Admn. Building after Typhoon. Windows doors furniture documents etc. were damaged and washed by storm surge but main building structure was not seriously damaged	Condition of the wharf after typhoon(left). Wharf structure was not damaged by storm surge and waves. Storm surge overflow the wharf and remaining debris. PCG vessel at the open space near entrance gate (right).
Rehabilitation	 Survey Team	 Survey Team	     Survey Team
	Renovated Warehouse (Wall material change to CHB)	Renovated Admin. Building	It was not found the damage caused by typhoon during the investigation. Condition of the wharf deck and piles are basically sound. Open-type wharf is rehabilitaing by mean of steel pipe sheet pile.

Summary of the Investigation of Port Facilities in Bohol Area

Port Facilities	Unit	TAGBILARAN	JAGNA	UBAY	TUBIGON	CATAGBACAN	GETAFE	TAPAL	POPOO	Guindluman
Cargo Berthing length (depth, m)	m	705.3 (8.0 m)	153.00 (11.0m)	222.00 (3.0m)	396.00 (5.2m)	144.00 (4.00-6.00m)	46.5 (6.5 m)	36.00 (4.00m)	21.8 (1.5m)	66 (1.0 m)
Degree of damage		Edge of pier damaged			Pier blocks move 5cm	Totally damaged Pier removed				Stair landing damaged
RORO Facilities	Unit	2	2	3	2	2	2	1	None	None
Degree of damage					Settlement by 30 cm	Totally damaged Ramp settled	Settlement by 30 cm			
Total port area	m^2	53,150	7,309	33,909	19,421	3,304	3,217	3,985	Cause way 222m	2,400
Open Storage	m^2	5,688	390	19,873	2,813	441	600	1,725	None	Fish market
Degree of damage		Pavement crack and elevation gap 40cm			Pavement & access road crack 20 to 30cm	Pavement crack 30 to 40cm				
Warehouse or Transit shed	m^2	600								
Working area	m^2	20,705	4,693	7,202	1,951	849	926	1,182	None	None
Vehicle Parking Areas	m^2	5,336	300	1,520	2,957	None	400	None	None	None
Passenger Terminal Building	m^2	623.4	240	210	1,472	None	None	30	100	None
Degree of damage		Totally damaged								
ADM Buildg	m^2	760.2	Tran. Shed300	120	68	60	60	30	None	None
Degree of damage		Totally damaged			Leaning 15 degrees	Gate house settled				
Degree of total damage		Serious damage	Very Minor	Very Minor	Medium damage	Serious damage	Medium damage	Very Minor	Very Minor	Damaged by Yolanda
Rehabilitated date, cost(mil. Peso)										

	Tagbilaran			Tubigon		Cataghacan (Loon)	Getafe
Damaged Conditions by Typhoon Yolanda	 PPA	 PPA	  PPA Survey Team	 PPA	  PPA	  PPA	 
	(Top) Broken landside concrete piles of the Berths (IBRD finded) (Down) Broken Pile cap concrete for steel pipe pile (PPA funded)	Settlement and cracks of yards (40cm elevation gap)	Cracks on floor and structures of Administration and PTB abandoned.	Broken concrete piles of the pier	Cracks on the pavement of open storage and access	The super structure of the cruise ship berth which moved outward. Cruise berth was demolished and removed.	Cracks on the pavement of open storage and access
Rehabilitation			 Survey Team	 Survey Team			  Survey Team
	No repair yet	Rehabilitated (Partially still under repair)	New PT Building (under construction)	Pavement are repaired but the piles of pier are not yet. Port Manager info: Ground level raise 1m at Catagbacan and settle 1m at Tubigon and Clarin.		No repair yet	Some raked piles at RORO ramp were broken. Asphalt was filled in the crack of pavement.

Summary of the Investigation of Port Facilities in Iloilo Area

Port Facilities	Unit	ILOILO			DUMANGAS	ESTANCIA (PPA)	ESTANCIA (Fish Port)	BANATE	GUIMBAL	CULASI
		Commercial (Container)	San Pedoro (General Cargo)	River Wharf						
Cargo Berthing length (depth, m)	m	526 (10.5 m)	634.3 (6.0 m)	980 (5.0 m)	108 (4.5 m, 6.0 m)	117 (6.0 m)	160	Causeway 300	39 (16.0 m)	33 (2.5 m)
Degree of damage						Pier slab damaged by uplift of wave				
RORO Facilities	Unit	1	1	3	2	None	None	None	None	1
Total port area	m^2	222,000	35,976	-	Approx. 22,000	Approx. 8,000	Approx. 20,000	Approx. 1,000	Approx. 7,300	Approx. 2,500
Open Storage	m^2	86,192	3,800	-	-	4,490	-	None	None	None
Warehouse or Transit shed	m^2	CFS 7,500	-	-	None	None	Market hall 500	None	None	None
Degree of damage						Rock mound & pavement repair	Flood up to roof			
Marshalling Area	m^2	27,500	2,366	-	1,800	None	-	None	None	None
Vehicle Parking Areas	m^2	Equipment shed 525	None	-	Approx. 2,000	None	-	None	None	None
Passenger Terminal Building	m^2	None	2,100	-	750	480	None	None	None	Approx.. 80
ADM buildg	m^2	-	-	-	60	48	-	None	None	None
Degree of total damage		Very Minor	Very Minor	Very Minor	Very Minor	Midium Damage	Minor Damage	Very Minor	Very Minor	Very Minor
Rehabilitated date, cost(mil. Peso)						2014/12/10, (7.0)				

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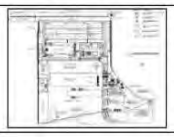
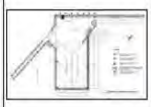
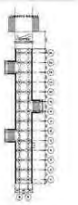
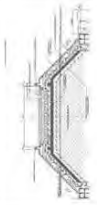
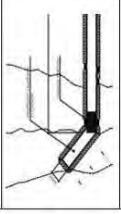
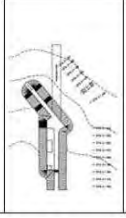
	Iloilo		Dumangas	Estancia (PPA)	Estancia (LGU)
	Container Terminal	Fort San Pedro(Gen Cargo)			
Damaged Conditions by Typhoon Yolanda					
	Damage by Typhoon Yolanda is minor.		Damage by Typhoon Yolanda is minor.	Slab and piles at landside of approach pier were damaged by typhoon. Revetment near approach pier was eroded by typhoon. Storm surge up to window of ground floor. Damaged by oil leakage from grounded generator barge nearby.	Minor damage for berthing facilities but roof of market hall was damaged by storm surge by typhoon.
Rehabilitation	  	   	 	    	 
	Concrete condition under the slab could not inspect due to wave conditions.	Relatively good condition except few concrete piles are damaged.	No inspection due to high tide	Slab and piles at landside of approach pier have been repaired. Revetment have been rehabilitated. (portion of white concrete) No structural damage for buildings.	Damage has been rehabilitated.

Summary of Bohol and Yolanda Disaster Rehabilitation Project for DOTC

	Bohol Rehabilitation						Yolanda Rehabilitation	
	Guindulman	Inabanga	Baclayon	Mribojoc	Clarin	Buenavista	Albuera Port (Leyte)	Banate Port (Iloilo)
Population	31,789	43,291	18,630	20,491	20,296	27,031	-	29,543
No. of Barangays	19	50	17	22	24	35	-	18
Source of Livelihood	Fish and Agri.	Fish and Agri.	Fishing and Farming	Fish and Agri.	-	-	-	Fish and Agri.
Handling cargo							-	Fish, shell, etc
Damaged facilities							-	
-Causeway	Erosion	Settlement	Erosion	Erosion	Erosion	Erosion	Erosion	Shoulder
-Landing facilities	Stair landing damaged	Settlement	-	-	-	-	Stair landing	Stair landing
Estimated cost for Rehabilitation (Mil. Peso)	19.3	33.8	6.2	12.7	5.5	1.9	7.9	3.0
Phot of Damage								
Proposed Plan of Rehabilitation								

Summary of Existing Structural Type of Berthing Facilities for Three Provinces

	Pier				Sheet Pile Quaywalls		Causeway
	Finger Pier	Open-type Wharves			Concrete Sheet Piles	Steel Sheet Piles	
		Concrete Piles	Steel Pipe Piles				
			Vertical & Raking Piles	Vertical Piles			
Type of Structure	Most piers in Philippines are supported by concrete piles.	Coupled raking piles are adopted for open-type wharves on concrete piles to resist the horizontal forces.	In case of deep water wharves and quay cranes on the deck, coupled raking piles may be required due to the large horizontal forces. In this study, the container wharf in Iloilo Port is the one for disaster resilient.	Vertical steel pipe piles are selected to resist the horizontal forces by vertical piles only. They have the feature of easier construction procedure than raked piles.	Concrete sheet piles are selected for the most cases of shallow water wharves in Philippines due to less anticorrosion treatment required. Anchor wall is selected for the most of anchor type.	In case of more than 10 m water depth, steel sheet piles and/or steel pipe piles are used instead of concrete sheet piles. Most of the anchors are steel pipe piles (vertical piles or coupled raking piles).	Small-scale wharf for shallow draft vessels
LEYTE (Total 9 ports)	Tacloban(15°), Ormoc(15°), Isabel(5°), Palompon(7°), Hirongos(N/C), Baybay(15°), Bato(0°, ramp 10°)	Tacloban, Palompon, Ormoc				Tacloban (Steel Pipe Sheet Pile)	Babatngon, Hindan (Suspension of causeway)
BOHOL (Total 10 ports)	Tagbilaran Passenger berths(10°), Catagbacan(15°), Ubay(15°), Tubigon(N/C), Talibon(N/C), Getafe (N/C)	Tagbilaran	Tagbilaran			RoRo ramp in Tagbilaran	Popoo, Guindulman (Existing), Dimino, Carlin
ILOILO (Total 7 ports)	Dumangas(N/C), PPA Estancia(10°), Guimbal(N/C), Ajuy(5° to10°), DOTC Estancia N/C: Not Clear	Iloilo FSP (Fort San Pedro Terminal), Iloilo IRW (Iloilo River Wharf)	Iloilo ICPC (Iloilo Commercial Port Complex)	Iloilo ICPC (Iloilo Commercial Port Complex)	Old Iloilo FSP (Fort San Pedro Terminal), but now steel sheet pile in front	Iloilo FSP (Fort San Pedro Terminal)	DOTC Estancia, Banate,
Percentage	64%	18%	7%	4%	-	7%	-

Type and Area of Buildings for Disaster Resilient Ports

Name of buidings	Unit	TACLOBAN	ORMOC	TAGBILARAN	TAPAL	ILOILO (ICPC)	PPA ESTANCIA
Administration/ Office Building		RC Building w Roof Deck	RC Building w/ GI Roofing	Mixed Mat'ls w/ GI Roofing (Temporary)	RC Building w/ Roof Deck	RC Building w/ Roof Deck	RC Building w/ GI Roofing
		3 Storey	1 Storey	2 Storey	1 Storey	4 Storey	2 Storey
	m^2	686 x 3	281	261.45 x 2	30	435 x4	240 (2nd Flr. only)
CFS		None	None	None	None	RC Building w/ GI Roofing	None
						1 Storey	
	m^2					7467.4	
Warehouse		RC Building w/ GI Roofing	None	RC Building w/ GI Roofing	None	RC Building w/ GI Roofing	None
		1 Storey		1 Storey		1 Storey	
		540		300		1027.8	
Passenger Terminal Building		None	RC Building w/ GI Roofing	RC Building w Roof Deck	None	None	RC Building w/ GI Roofing
			1 Storey	2 Storey			2 Storey
	m^2		1,412	397 x 2			240 (Grnd Flr. only)

Evaluation of Existing Berthing Facilities for Survey Ports

	Description
A	Minor damage, 80 to 100% operational
B	Midium damage, 60 to 80% operational
C	Big damage, 40 to 60% operational
D	Not operational, less than 40% operational

	Tacloban	Palompon	Isabel	Ormoc	Baybay	Hilongos	Bato
Type	Pier	Open type wharf	Pier	Pier	Pier	Pier	Pier
Piles	PSC (40cm x 40cm)	RC (40cm x 40cm)	RC (40cm x 40cm)	RC (40cm x 40cm)	RC (40cm x 40cm), RC(45cm x 45cm)	RC	RC
Pile Angle	0 & 15	0 & 7	0 & 5	0 & 15	0 & 15	0 & ?	0 & ?
Slab & Beam	Slab: Precast type Beam (W50xH40cm) No damage	Partialy under repairing slab concrete	No damage	Beam (W40xH30cm) Partialy damaged Under repairing	Slab bottom is partialy damaged.	No damage	No damage
Retaining Wall	Conc. Sheet Piles	Conc. Sheet Piles	Concrete Walls	-	-	Concrete Walls	Concrete Walls
Condition	A	A	A	B	B	A	A
	No damage	No damage	Partialy damaged piles	Damaged slab	Damaged slab	No damage	No damage

	Tagbilaran	Ubay	Tubigon	Catebacan (Loon)	Clerin	Getafe	Tagal
Type	Open type wharf	Pier	Pier	Pier	Pier	Pier	Pier
Piles	SPP ϕ50cm, RC40cm	RC (40cm x 40cm)	RC (40cm x 40cm)	PSC (45cm x 45cm)	RC (40cm x 40cm)	RC (40cm x 40cm)	RC (40cm x 40cm)
Pile Angle	0 & 10	0 & 15	0 & ?	0 & 15	0	0 & ?	
Slab & Beam	Pile caps are partialy damaged.	Slab concrete is partialy damaged due to hit by ship	Damaged by earthquakes	Most of the facilities are destroied by earthquakes.	All washed away		
Retaining Wall	Under constructing concrete walls due to damaged by earthquake	Conc. Sheet piles	Damaged by earthquakes	Causeway Under repair due to earthquake		Concrete Walls	
Condition	B	B	B	D	D	B	A
	Partialy damaged piles	Partialy damaged	Raking piles are damaged by quake.	Seriously damaged	Seriously damaged	few piles are broke	No damage

Evaluation of Existing Berthing Facilities for Survey Ports

	Description
A	Minor damage, 80 to 100% operational
B	Midium damage, 60 to 80% operational
C	Big damage, 40 to 60% operational
D	Not operational, less than 40% operational

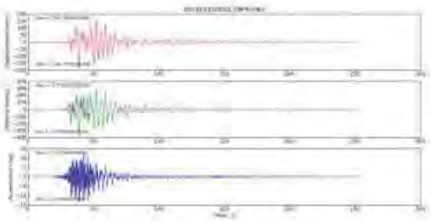
	Iloilo (Container)	Iloilo (Gen Cargo)	Iloilo (River Wharf)	Dumangas	Estancia (PPA)	Ajuy Culasi
Type	Open type wharf	Open type wharf	Open type wharf	Pier	Pier	Pier
Piles	SPP ϕ1020mm (IBRD) SPP ϕ600mm (PPA) RC (50cm x 50cm) (PPA)	RC (40cm x 40cm)	RC 40cm 45cm, PSC 40cm	RC (40cm x 40cm	RC (40cm x 40cm)	RC (40cm x 40cm)
Pile Angle	0 & 15 & 20	0 & ?			0 & 10	0 & 10
Slab & Beam	Crane rails on slab				Pile caps damaged by Yolanda are repaired.	No damage
Retaining Wall						L-shaped Conc. Walls
Condition	A	A	A	A	A	A
	No damage	No damage	No damage	No damage	No damage (Repaired)	No damage

Considerable Disaster by Natural Phenomena for Disaster Resilient Ports

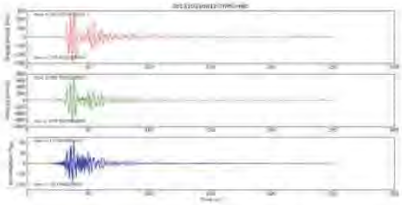
Natural Phenomena	External Force	Type of facility and damage	Design condition	Target facilities
Typhoon	Wind	Damage of port building (Roof, window, door)	wind speed 240kph of Yolanda	Model: Buildings
	High wave	Damage of berthing facilities, revetment, causeway (move, settle, erode, etc.)	No damage except minor damage in Estancial	Model: Estancia pier only
	Storm Surge	Damage of port building (flood, window, door, equipment)	Storm surge height (m) by OCD estimation for all province	Model: Buildings
Earthquake	Seismic movement	Berthing facility and building (move, settle)	Ground acceleration and design seismic coefficient Kh=0.20	Model: Berthing facility, Buildings
	Liquefaction	Ground settlement	No soil condition available	Reference cost only
Tsunami	Inundation	Same as storm surge	Tsunami height (m) by OCD estimation for all province except Iloilo	Model: Berthing facility, Buildings
	Wave pressure	Damage of breakwater		

Design Condition of Earthquake (Bohol)

Vertical Movement

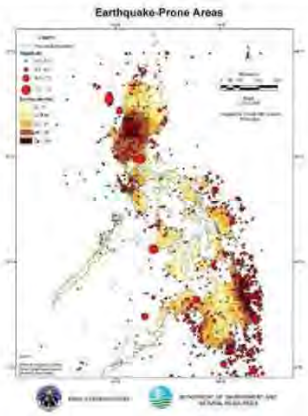


Horizontal Movement



Max. acceleration (214 gal)

Design seismic coefficient Kh=0.20

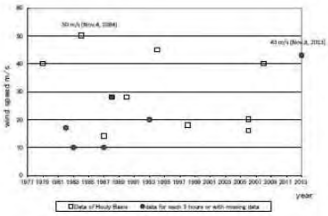


	Magnitude	Origin	Location	Date
1	7.9	Tectonic	Moro Gulf	August 16, 1976
2	7.8	Tectonic	Luzon Island	July 16, 1990
3	7.5	Tectonic	Luzon Island	November 30, 1645
4	7.6	Tectonic	Mindanao	March 31, 1955
5	7.3	Tectonic	Casiguran, Aurora	August 2, 1968
6	7.2	Tectonic	Bohol & Cebu	October 15, 2013
7	7.1	Tectonic	Mindoro	November 15, 1994
8	6.7	Tectonic	Negros Oriental	February 6, 2012
9	8.3	Tectonic	Panay (Lady Caycay)	January 25, 1948
10	*Unknown*	Tectonic	Manila	June 19, 1665

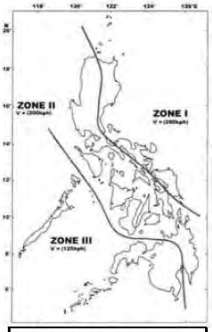
Big 10 Earthquake in the Philippine

Design Condition of Typhoon (Yolanda)

Track of Yolanda November 2013



Biggest wind velocity in the year from 1977 to 2013

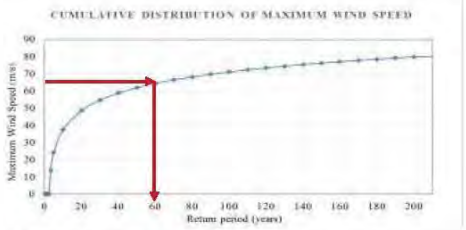


NSCP Design wind Speed

Wind speed of Yolanda (source PAGASA)

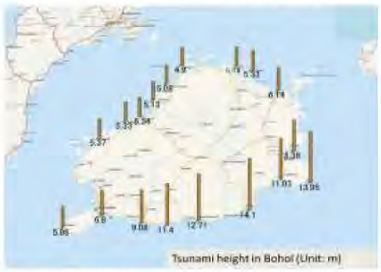
Based on the barograph, the lowest station pressure observed in Guiuan Station before the instrument was damaged by TY Yolanda was 910 hPa at 5:00AM, 08 November 2013. At this pressure, the equivalent **maximum sustained wind is 240kph**

Design wind speed 240kph



Provability Analysis for Typhoon Yolanda

Estimated Storm Surge and Tsunami Height (m) based on the Historical Record Source OCD Ready Project



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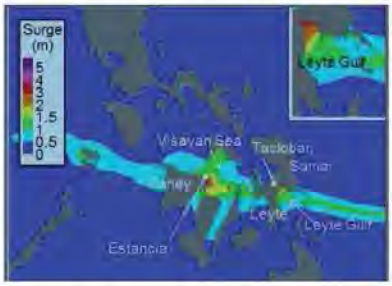
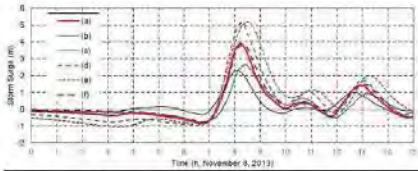
Design Condition of Storm Surge (Yolanda)

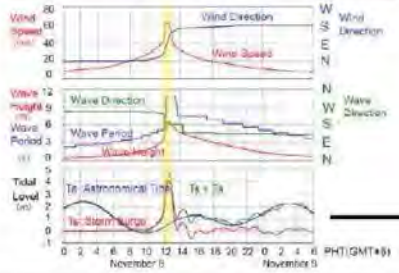


Height of Storm Surge by Yolanda

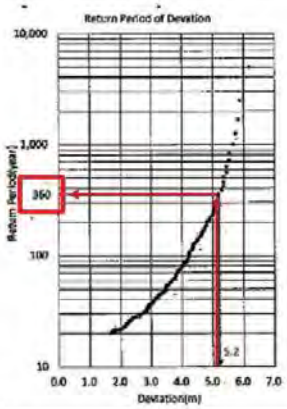


Simulation of Storm Surge at Tacloban

	Storm Surge by Yolanda	Estimated Storm Surge by OCD
Tacloban	4.00	3.42 (at Bgy. San Roque, Tanauan)
Estancia	4.00	3.86



Simulation with site survey data of wind speed, wave and Storm Surge at Estancia



Estimated Return Period of Storm Surge by Yolanda

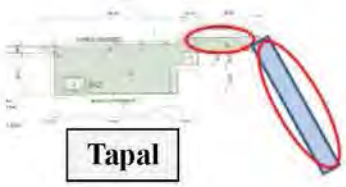
Professor, Eric C. Cruz
D. Eng UP

Location of Disaster Resilient Port Facilities in Selected Ports

Tacloban

Ormoc

Tagbilaran



Tapal

Iloilo

:Location of SDM

Estancia

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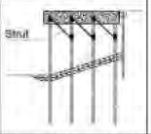
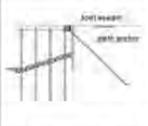
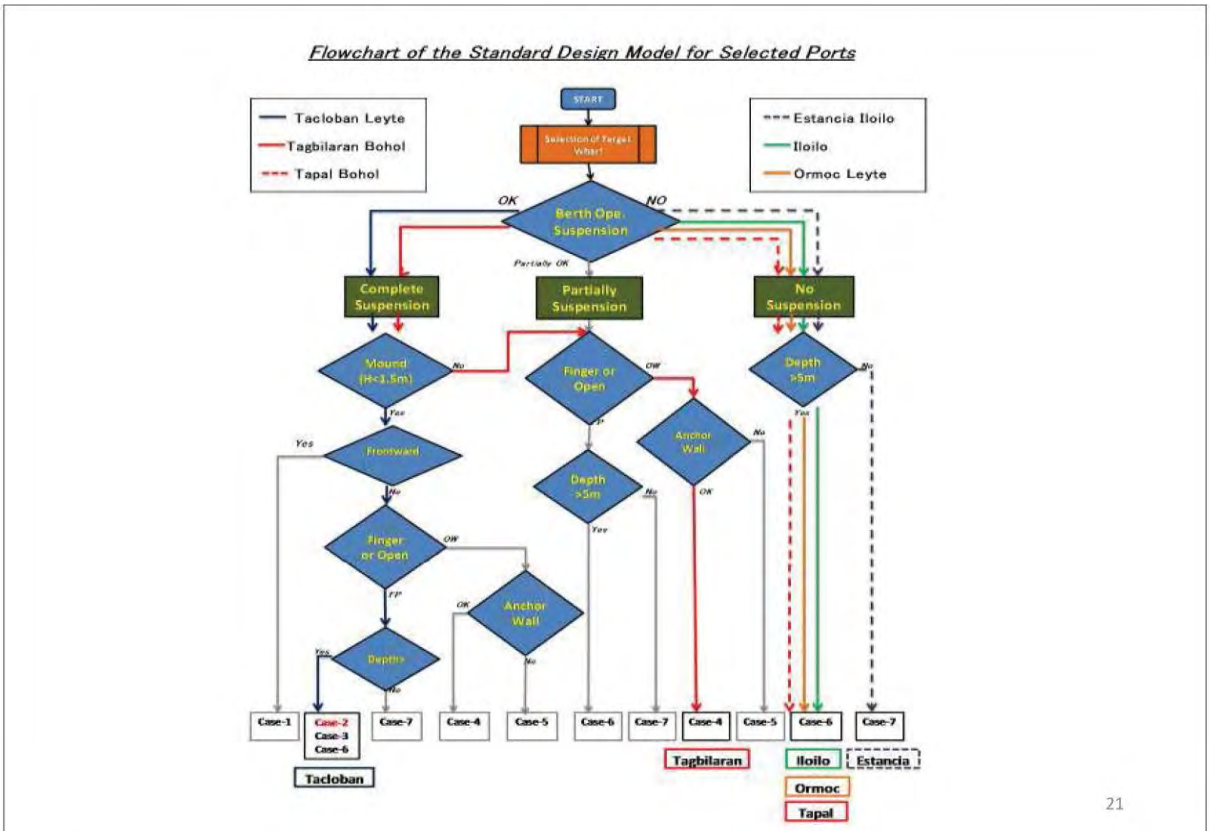
Typical Sections of Standard Design Model for Earthquake

	Case-1	Case-2	Case-3	Case-4	Case-5	Case-6	Case-7
Method	Installation of Coupled Raking Piles in front of Berth line	Removal of Deck and Installation of Coupled Raking Piles	Removal of Deck and Installation of Submerged Struts	Installation of Tie Rod, Anchor Wall and Sealant	Installation of Ground Anchor and Joint Sealant	Installation of Submerged Steel Beams	Installation of Reinforced Concrete Beams
Typical Section							
General Description	・Additional raking piles resist against the horizontal seismic forces. ・Raking piles and coping concrete are installed in front of the existing berth. ・The berth line is shifted seawards.	・Additional raking piles resist against the horizontal seismic forces. ・Existing deck concrete is removed partially. ・Coupled raking piles are installed between the existing piles. ・Removed area is to be reinforced and rehabilitated.	・Additional strut structure resist against the horizontal seismic forces. ・Submerged struts are installed onto the existing piles after removal of all deck concrete. ・Grouting mortar is injected between struts and piles to be integrated firmly. ・After setting struts, new deck concrete is reconstructed.	・Additional anchors with tie rods resist against the seaward horizontal seismic forces. ・Retaining wall resists the landward horizontal seismic forces through joint sealant. ・Land side deck concrete is removed partially and tie rods are installed to connect between deck and anchor wall. ・After installation of anchor, deck concrete is rehabilitated.	・Additional ground anchors resist against the seaward horizontal seismic forces. ・Retaining wall resists the landward horizontal seismic forces through joint sealant. ・Land side deck concrete is removed partially and ground anchors are installed. ・Deck concrete is rehabilitated after installation of ground anchors.	・Additional submerged beams reinforce pile structure to resist against the horizontal seismic forces. ・Submerged steel beams are installed to connect the existing piles each other. ・Grouting mortar is injected between steel beam and pile to be fixed firmly.	・Additional reinforced concrete beams reduce the stress of the existing piles and increase the resistances against the horizontal seismic forces. ・Concrete beams are constructed underneath the existing concrete beams.
Special Consideration for Rehabilitation	・Berth utilization is totally stopped due to construction of new concrete deck. ・Due to big equipment for construction, it is not recommendable for small size of berth (depth and length).	・Berth utilization is totally stopped due to demolition and reconstruction of the center of concrete deck. ・Due to big equipment for construction, it is not recommendable for small size of berth (depth and length).	・Berth utilization is totally stopped due to demolition and reconstruction of all concrete deck. ・Due to big equipment for construction, it is not recommendable for small size of berth (depth and length).	・Firm retaining wall structure is necessary behind the pier to resist horizontal seismic force. ・The space for construction area of anchor wall with tie rod is necessary. ・Berth utilization is partially possible due to the construction area behind the pier.	・Firm retaining wall structure is necessary behind the pier to resist horizontal seismic force. ・The space for construction area of ground anchor on the pier is necessary. ・Berth utilization is partially possible due to the small construction area on concrete deck.	・Berth utilization during construction is possible due to no construction work on land. ・Due to special equipment/tool such as floater, Special experience is necessary. ・It is applicable for large scale structure due to flexibility of large size of beam.	・Berth utilization during construction is possible due to no construction work on land. ・Due to minimal equipment for construction, no special experience is neccessary. ・It is applicable for small scale structure only due to additional beam under the concrete deck.
Main Materials	・Steel pipe piles have more resilience than PC piles. ・Steel pipe piles can be driven with 20-25 degrees of slope.	・Steel pipe piles have more resilience than PC piles. ・Steel pipe piles can be driven with 20-25 degrees of slope.	・Submerged struts are fabricated in the suitable factory. ・Grouting mortar is necessary.	・Tie rods are available in the Philippine.	・Ground anchors are to be imported from foreign countries.	・Submerged steel beams are fabricated in the suitable factory. ・Grouting mortar is necessary.	・Rebars and concrete only
Quality Control	・No special skill is necessary.	・No special skill is necessary.	・Special experience for installation is required to construct submerged struts.	・No special skill is necessary.	・Special experience for installation is required to construct ground anchors.	・Special experience for installation is required to construct submerged beams.	・No special skill is necessary.
Workability	・Floating piling barge is required to be able to drive a raking pile. ・No special skilled works is needed.	・A special stage to be able to install raking pile is set on the deck. ・Normal construction methods are adopted except above stage. ・No offshore equipment is required.	・Demolition of all deck concrete is required. ・The dimensions of struts are to be adjusted by measuring the existing pile locations. ・Special engineering know-hows are required for installation of struts. ・Many kinds of works are to be carried out and construction period will be the longest.	・ Basically all works are onshore. ・ The deck side of tie wire should be fixed firmly with deck concrete to retain the horizontal forces. ・ Joint sealant is installed between deck concrete and coping of revetment.	・ Basically all works are onshore. ・ Drilling equipment is required to set the ground anchor into bearing layer. ・ The deck side of ground anchor should be fixed firmly with deck concrete to retain the horizontal forces. ・ Joint sealant is installed between deck concrete and coping of revetment.	・Special technical know-hows are required to install the submerged steel beams below the deck concrete. ・The length of each beam are determined by the location of the existing piles. ・Most of works are carried out under water. ・Special floater is necessary to install submerged beam.	・Large temporary stagings under water are required because most of works should be carried out below low tide level. ・Underwater concrete should be placed with securing the good quality of concrete. ・High-early-strength cement may use to utilize the berth after concrete placing.

Note : For all of type of above reinforcing structure, Environmental Performance Report and Management Plan (EPRMP) is required.

Preliminary Evaluation for Economical, Operational and Technical Matters for Standard Design Model

		Case-1		Case-2		Case-3		Case-4		Case-5		Case-6		Case-7	
Method		Installation of Coupled Raking Piles in front of Berthline		Removal of Deck and Installation of Coupled Raking Piles		Removal of Deck and Installation of Submerged Struts		Installation of Anchor Wall and Sealant		Installtion of Ground Anchor and Joint Sealant		Installtion of Submerged Steel Beams		Installtion of Reinforced Concrete Beams	
Item	Priority Weights	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Quality Control	3	2	6	2	6	3	9	1	3	3	9	3	9	2	6
Workability	3	3	9	3	9	4	12	1	3	2	6	3	9	2	6
Construction Period	3	4	12	4	12	5	15	2	6	2	6	1	3	3	9
Work Suspension Period	2	3	6	3	6	4	8	2	4	2	4	1	2	1	2
Construction Cost	1	5 (1.00)	5	5 (1.03)	5	4 (0.75)	4	1 (0.32)	1	2 (0.39)	2	4 (0.70)	4	3 (0.61)	3
Total Score		38		38		48		17		27		27		26	
Rank		3		3		4		1		2		2		2	


Flowchart of the Standard Design Model for Selected Ports
Tacloban Leyte
Tagbilaran Bohol
Tapal Bohol
Estancia Iloilo
Iloilo
Ormoc Leyte
START
Berth Ope. Suspension
OK
NO
Partially OK
Complete Suspension
Partially Suspension
No Suspension
Mound (H<1.5m)
Finger or Open
Depth >5m
Anchor Wall
Frontward
Depth >5m
Finger or Open
Anchor Wall
Depth>
Case-1
Case-2
Case-3
Case-6
Case-7
Case-4
Case-5
Case-6
Case-7
Case-4
Case-5
Case-6
Case-7
Tacloban
Tagbilaran
Iloilo
Estancia
Ormoc
Tapal
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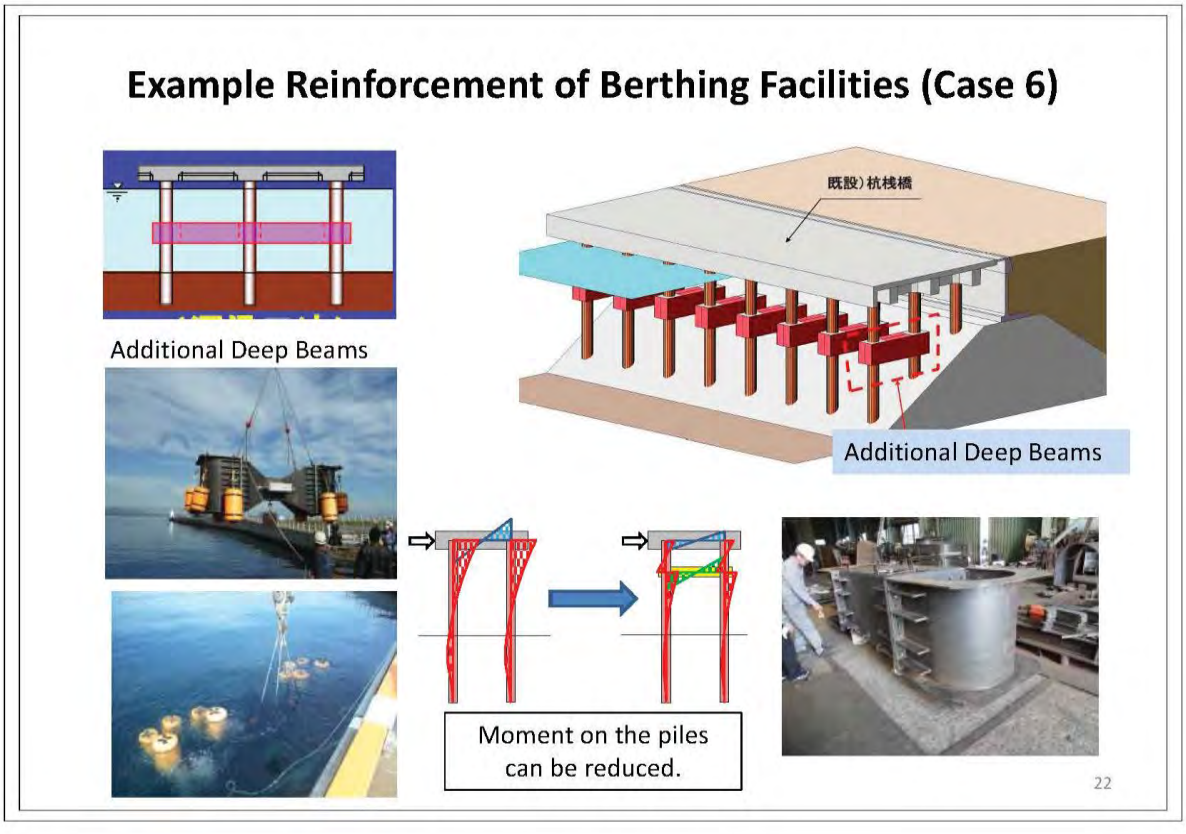

Example Reinforcement of Berthing Facilities (Case 6)
既設）杭桟橋
Additional Deep Beams
Additional Deep Beams
Moment on the piles can be reduced.
22

Expected Damage by Typhoon Wind

Design Criteria
- Current National Structural Code of the Philippines (NSCP) version 2010 divides the country into three zones.
- Design wind speed of Leyte, Bohol and Iloilo is 200kph=55.6m/sec
- Estimated wind speed of Yolanda is 240kph=66.7m/sec

1) Disaster for marine and civil structure by typhoon
Basically there is no damage for civil and marine structure by typhoon wind.

2) Disaster for building structure
-For the Yolanda level of typhoon, common wooden and GI roofing building is not strong enough, all port buildings is recommended RC with CHB and heavy duty door and window.




Expected damage for Storm Surge and Tsunami

Expected height of Storm Surge and Tsunami based on OCD report are as below;

	Tacloban	Olmoc	Tagbilaran	Tapal	Iloilo	Estancia
Storm Surge (m)	4.00	2.97	2.69	2.23	3.49	3.86
Tsunami (m)	4.00	3.00	6.80	6.14		

Overflow of storm surge on the wharf

Damaged transit shed by storm surge

Tsunami overflow the seawall in North Japan

Damaged precast slab by Tsunami in Japan

Based on the Japanese Tsunami, there was damage of precast slab between open-type wharf and retaining wall by 10m height tsunami in several ports as shown the photo.

Proposed Disaster Resilient Facilities for Storm Surge and Tsunami

Berthing facilities

- Precast slab provision for the pier for 6m height of Tsunami

Buildings

ADM

- Office :2nd floor
- Office equipment: 2nd floor
- Doc, file:2nd floor

Transit shed and Warehouse

- All existing transit shed and warehouse are RC structure and GI roofing.

Passenger Terminal Building

- All existing PTB are RC structure and concrete roof deck or GI roofing.
- Further study for 6m high tsunami for the buildings of Tagbilaran. Tapal no building.

Utilities

Utilities

- Power supply
- Water supply
- Communication

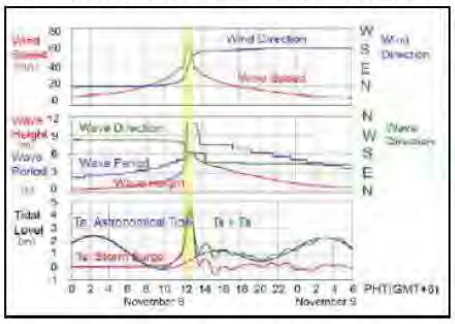
- Above utilities will be provided after disaster.

Others

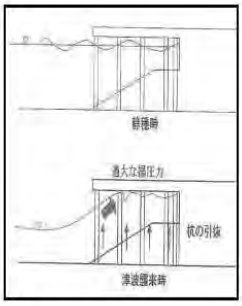
Expected damage by Wave of Typhoon

As experienced during typhoon Yolanda, there is no damage for the berthing facility except Estancia because all selected ports are sheltered from the high wave or located closed sea.

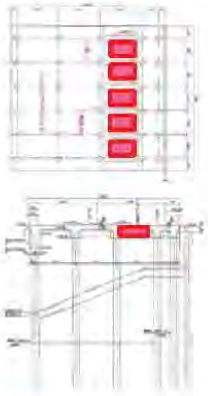
Condition of the wave action at Estancia



Condition of tide and wave height



Uplift pressure due to high wave



: Precast slab

In order to prevent the damage of the pier and piles by uplift, precast slab shall be provided to reduce the uplift pressure.

Preparation of Standard design Model for the berthing facilities, buildings, utilities and others for disaster resilient.

Standard Design Model of berthing facilities for Disaster Resilient Ports are as follows.

Name of Port	Leyte Area		Bohol Area		Iloilo Area	
	Tacloban	Ormoc	Tagbilaran	Tapal	Iloilo	Estancia
Case No.	Case 2	Case 6	Case 4	Case 6	Case 6	Case 7

Basis of the Cost Estimate for standard Design Model

1. Cost estimate includes standard design model for berthing facilities, buildings, utilities and additional facilities for disaster resilient except followings;

1) Repair for damage on the existing facilities
2) Rehabilitation of deteriorated structure
3) Improvement for the existing facilities

END OF PRESENTATION

THANK YOU FOR YOUR ATTENTION

2.4. Consultation Meeting

(1) Minutes of the Meeting

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

Date:	September 30, 2015
Venue:	DOTC Headquarters 16/F Unit166 Columbia Tower Ortigas Avenue, Mandaluyong City 1555 Philippines
Purpose:	Explanation of the Intermediate Report by the JICA Study Team
Participants:	See attached attendance sheet
Handout materials:	Presentation paper Scope of the Study and Survey Method

1. The consultation meeting on Data Collection Survey on Disaster-resilient Feeder Ports and Logistics Network in the Republic of the Philippines was held on September 30, 2015 at the meeting room Unit 166 of the Department of Transportation and Communications (herein after referred to DOTC) under the participation of personnel of DOTC, PPA, NEDA, DBM, DOF, DILG, DPWH and PHIVOLCS. The attendees are shown in the attached attendance sheet

2. The JICA study team made presentations on intermediate results of main subjects of the survey: the disaster resilient ports in the target area and guidelines on disaster resilient ports; guidelines of social ports and trial selection in the target area; and standard model design of disaster resilient port facilities of the disaster resilient ports in the target area. In addition, findings on port activities and port network in the target area and budgetary system of Philippines related to Disaster Risk Reduction Management were presented.

3. The following discussion points were tackled during the question and answer sessions.

Mr. Paul Irineo P. Montano, Local Government Operations Officer IV, representative from DILG, raised clarification under Item 4-2 (Screening Criteria based on Basic concept of Social Port), why put the title 'Regional Economy' while what you needed is the population of the municipality? He also asked whether the criteria could be applied in prioritizing from a viewpoint of LGU.

Mr. Shimada answered that the method of prioritizing the social port under LGU could be

applied when LGU intended to give the priority. He added it was better to add local factors.

Mr. Maximo M. Montana II, representative form DPWH made also the following observations on Item 4-2.

- Item a (Municipality Income Grade) under #1 Human Security should be well described in #3 Regional Economy;
- Item a (Population of Municipality) under # 3 Regional Economy can well describe the extent of population served by the social port under #1 Human Security; and
- Under #2 Transportation, would term "access" from National Highway be more appropriate than distance from National Highway considering that the port is available through an access road to national highway?

Mr. Shimada explained that the word of accessibility included several factors such as time, pavement condition. Such detail factors shall be discussed in the second screening meeting. Simple indicator is better as a criterion.

Ms. Consuelo Beltran, Director IV and representative from DBM, commented that the project by PPP or ODA needs to be submitted and approved by NEDA ICC and Board.

This was confirmed by Ms Hazel Palapus, Repesentative form NEDA-Infrastructure Staff, but added that only those projects that cost P1 Billion and above need to be approved by the NEDA Board. Other infrastructure projects below the P1B will just need to be included in CIIP. Ms. Ellen explained that the budget of the project on social ports may be appropriated in normal process.

Ms. Dolly Asere, representative form DOF, made a comment on applying insurance to port facilities in case they are damaged due to typhoon, earthquake and tsunami, such that the LGUs or port administrator/operator can claim to rehabilitate the port. She also added that PPA rehabilitate its own port facilities using its own funds but that there are cases that PPA uses government fund in case there is a large scale disaster. Mr. Shishido said that the situation of ports in other countries would be checked whether this is being practised or not. Engr. Renato L. Yumang, a principal engineer of PPA, informed the Meeting that he will ~~to~~ confirm first with the Head Office whether PPA applies insurance or not.

Mr. Montano said that he will also look for a document on application of insurance scheme to public infrastructure and send the information to DOTC as soon as possible.

Mr. Montano further asked if the level of the LGU prioritization for port maintenance was considered in the selection criteria for social ports. He was of the view that the LGU may have included in their annual or multi-year investment plan the maintenance and/or construction of their own port/s and the LGU may have also different prioritization parameters. He then thought of the need to have a balance project selection methodology or

criteria.

Mr. Ferre of DOTC, informed that in the past and the current situation for ports programming, the Department used to receive various requests for port development coming from the different LGUs nationwide. Because of the extensive number of requests coming in but limited budget allocated for ports in a certain year, prioritization process is applied to select which ports need to be funded first and implemented. The existing selection criteria that we presently use is the subject of assessment by this Study to come up with an improved and more rational selection process/criteria.

Mr. Hayato Nakamura, representative from JICA, suggested that location of airport is one of important factors for disaster management and it should be mentioned in the report.

4. The participants acknowledge the contents of the presentations and agreed the basic direction of preparing guidelines for disaster resilient ports and social ports. The ports selected as disaster resilient ports are Iloilo port, Estancia Port, Tagbilaran Port, Tapal Port, Tacloban Port and Ormoc Port in the study and the direction of preparing standard design model for the proposed port facilities.

5. The study team will proceed to the finalization based on the result of the meeting.

6. Next consultation meeting will be held in the middle of November.

Date September 30, 2015

ENRICO C. FERRE

Division Chief
Water Transport Planning Division
Department of Transportation and 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: 16/F Unit166 Columbia Tower Ortigas Avenue, Mandaluyong City 1555 Philippines

Date: September 30, 2015

No.	Name	Organization/ Department	Position/ Title
1	RACHELLE RABINO	DPWH	OJT-PPD/Planning Service
2	GLORIA V. CUNANAN	DPWH	E-IV DPD.PS
3	RALPH JOED DELA CRUZ	DPWH	E-II , DPD, PS
4	MAXIMO M. MONTANA II	DPWH	PO IV
5	CONSUELO BELTRAN	DBM	CBMS
6	SHIELA YECLA	DBM	BMS
7	PAUL IRENEO P. MONTANO	DILG	LGOO IV
8	RENATO L. YUMANG	PPA	Municipal Engineer
9	FROILAN S. DE VERA	DOF	Finance Analyst
10	DOLLY ASERRE	DOF	Finance Analyst V
11	VICTOR B. PAMI	PHILVOLCS	PO I
12	HAYATO NAKAMURA	JICA Philippines Office	Project Formulation Adviser on DRRM
13	CORINA ISABEL C. ALCANTARA	DOTC- Office of the Undersecretary for Planning	Project Development Office
14	MILKY BABILONIA	DOTC- Office of the Undersecretary for Planning	Project Development Office
15	SHANICA SEN V. SOLLEGUE	DOTC- Office of the Undersecretary for Planning	Project Development Office

Attendance Sheet

Venue: 16/F Unit166 Columbia Tower Ortigas Avenue, Mandaluyong City 1555 Philippines

Date: September 30, 2015

No.	Name	Organization/ Department	Position/ Title
16	HAZEL PALAPUS	NEDA	Senior EDS
17	FELICISIMO C. PANGILINAN	DOTC	Deputy and OIC, Planning Service
18	ENRICO FERRE	DOTC - WTPD	Chief
19	ELENITA D. ASUNCION	DOTC - WTPD	Sr TDO
20	HOMER DELA PAZ	DOTC - WTPD	
21	DENNIS M. ALBANO	DOTC - WTPD	Sr TDO
22	BELINDA C. SALVOSA	DOTC - WTPD	SCDO
23	EMMA P. RIVERO	DOTC - WTPD	STDO
24	MENCHIE D. BOGNALOS	DOTC - WTPD	
25	MYRA B. MEDINA	DOTC - WTPD	
26	TATSUYUKI SHISHIDO	JICA Study Team	Team Leader
27	TAKASHI SHIMADA	JICA Study Team	
28	ISAO HINO	JICA Study Team	
29	KEN SAITO	JICA Study Team	
30	SUZANNE TORRES	JICA Study Team - Support Staff	

Attendance Sheet

Venue: 16/F Unit166 Columbia Tower Ortigas Avenue, Mandaluyong City 1555 Philippines

Date: September 30, 2015

No.	Name	Organization/ Department	Position/ Title
31	ERNESTO CRUZ	JICA Study Team - Support Staff	C.E
32			
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(3) Presentation Materials

1) Tentative draft for Discussion on Guidelines for Selecting Social Ports in the Target Area

Screening Criteria and Guideline for Social Ports Development

On 30 Sept. 2015
JICA Study Team for
Disaster –Resilient Feeder Ports
& Logistics Network

SHIMADA/JICA * OCDI 1

Takashi SHIMADA
Principal Researcher, OCDI

- In 1981, I started working in the Ministry of Transport (MOT) in Japan as a Civil Engineer.
- I have been engaged in transport planning and engineering for more than 33 years.
- I have also taken part in overseas projects such as in Algeria, Vietnam , the Philippines and Cambodia over a 10-year period.
- In 2004, I was also a lecturer of port and airport development policy at Kobe National University.
- I took an early retirement option of Ministry of Land, Infrastructure and Transport (MLIT) and have been working in OCDI since 2014 as a principal researcher.
- Contact Add.= t-shimada@ocdi.or.jp

SHIMADA/JICA * OCDI 2

Table of Contents

SHIMADA/JICA * OCDI

1. Ports in the Philippines

- Total Number of Philippine Ports= 2,035
- Public Ports= 1,612
  - Base Port & Terminal Ports = Relevant Port Authority
  - Other Governmental Ports
    - ✓ Social Port = National Fund (DoTC and Port Authority)
      Feeder Ports = Foregin Fund (DoTC), part of social ports
    - ✓ Tourism Port = Natonal Fund planned by DoT and DoTC
    - ✓ Fishing Ports = National Fund (PFDA)
- Private Ports= 423
  - Private Commercial Ports= Public Use
  - Private Non Commercial Ports= Particular Use

SHIMADA/JICA * OCDI

2-1 Back Ground for Social Port Development

1. Since 1992, the DOTC has took over the development of government ports (feeder port, social port) from DPWH.
2. After this, Feeder Ports by ODA were developed based on JICA Mater Plans Studied in 2000 and 2004.
3. Social ports developed by the national government budget are mainly based on LGU request or regional political will.

SHIMADA/JICA × OCDI

2-2 Current Budgetary System to develop Social Ports

1. Construction by Central Government=DoTC, DA, and Management Commission to LGU
2. Grant Budget by Central Government
3. IRA(Internal Revenue Allotment)=80%Project Cost
4. Funding Assistance=Budget Shear between Authority and LGU. Auditor' check for Specification and Financial Aspects is required
5. Invested fully by LGU= Highly Urbanized City
6. PPP or BOT

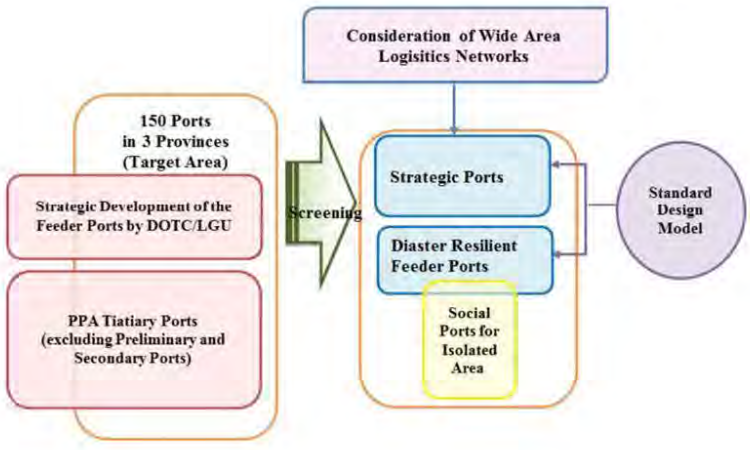
SHIMADA/JICA × OCDI

2-3 Current Issues for Social Port Management

1. LGU should assign staffs to manage social port by Local Law or Ordinance for collection of fees and safety management. But the management social port is not effective. Sometimes, social port facilities are abandoned and have not been utilized anymore.
2. Maintenance of port including other infrastructure is the last priority in LGU Budget.
3. LGU should be responsible for daily maintenance. On the other hand, the responsibility or burden share for large scale repair is not clearly.
4. Registration book on which social port facilities are listed, does not exist. Property management is not done appropriately.
5. Engineers in LGUs are mainly specialized to road and river engineering, but not familiar to port engineering. Sometimes, they request ports in inappropriate sites without considering natural conditions.
6. There is duplication or institutional conflicts among the relevant agencies.

SHIMADA/JICA * OCDI 7

3-1 Study Scope of Feeder Port System for Disaster Resilient and Isolated Area



SHIMADA/JICA * OCDI 8

3-2 Target Area and Major Ports

3 provinces, Iloilo, Bohol and Leyte

Around 142 Public Ports in the target area
Excluding Cebu and Negros

Legend
- Existing Ro-Ro Terminal (☆Base Key City Ro-Ro Terminal)
- On-going Ro-Ro Terminal Development
- Terminal Port
- CY2015 Social and Tourism ports development project

	Population			Area	Density
	1990	2000	2010	Km2	per Km2
Iloilo (excluding Iloilo City)	1,337,981	1,559,182	1,805,576	5,079.17	439.1
Iloilo City	309,505	366,391	424,619		
Bohol	948,403	1,139,130	1,255,128	4,820.96	260.3
Leyte (excluding Tacloban City)	1,230,925	1,413,697	1,567,984	6,515.05	274.6
Tacloban City	136,891	178,639	221,174		

SHIMADA/JICA * OCDI 9

3-3 Current Situation of Ports Development in Target Area

Classification	Symbol	Iloilo Prov.	Bohol Prov.	Leyte Prov.	Total
Population 2010 (,000)		**2,230**	**1,255**	**1,789**	**5,274**
Private	●	**10**	**6**	**10**	**26**
Base / Terminal	●	3	6	5	14
Social	●	21	68	39	128
Public Total		**24**	**74**	**44**	**142**
One Port /50,000 per Dev. Ratio		45 (0.53)	25 (2.96)	35 (1.26)	105 (1.35)
One Port in Municipality In the Coast		18 (1.33)	29 (3.00)	32 (1.38)	89 (1.59)

SHIMADA/JICA * OCDI 10

3-4 Ports in Target Area (1)

SHIMADA/JICA * OCDI 11

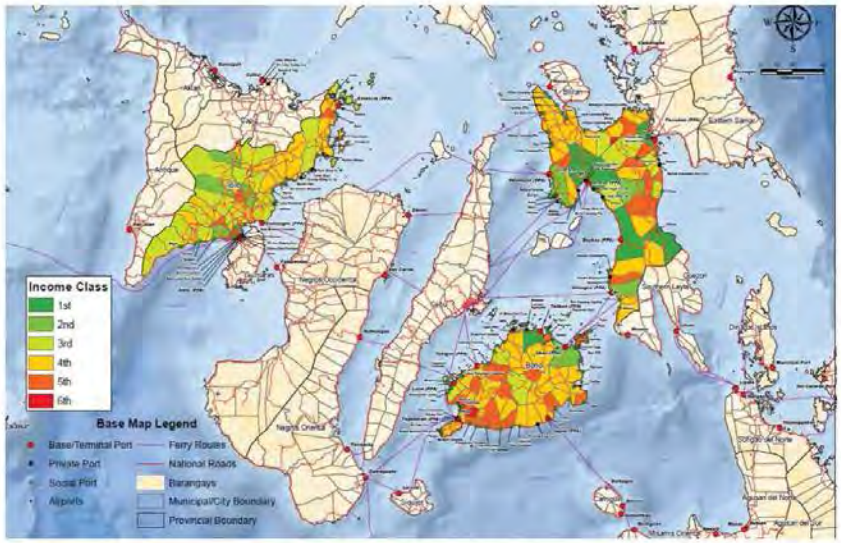
3-5 Ports in Target Area (2)

SHIMADA/JICA * OCDI 12

3-6 Ports and Population Distribution

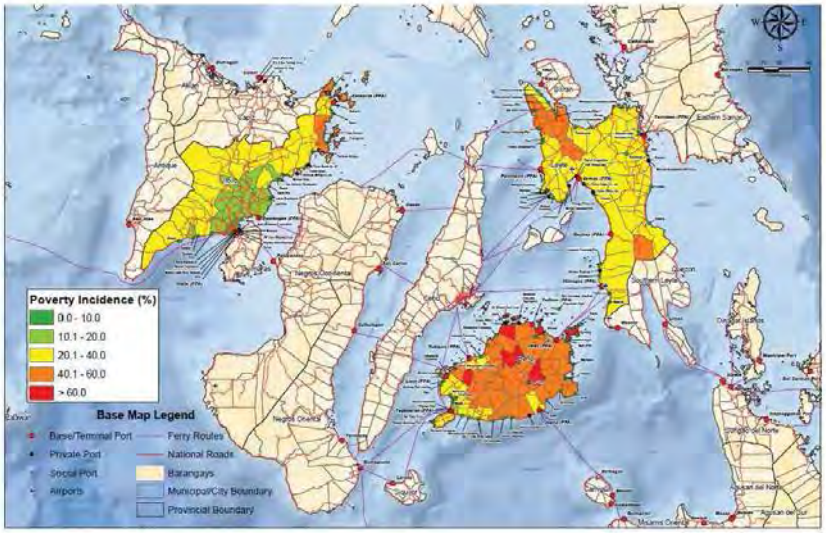
SHIMADA/JICA * OCDI 13

3-7 Ports and Municipal Income



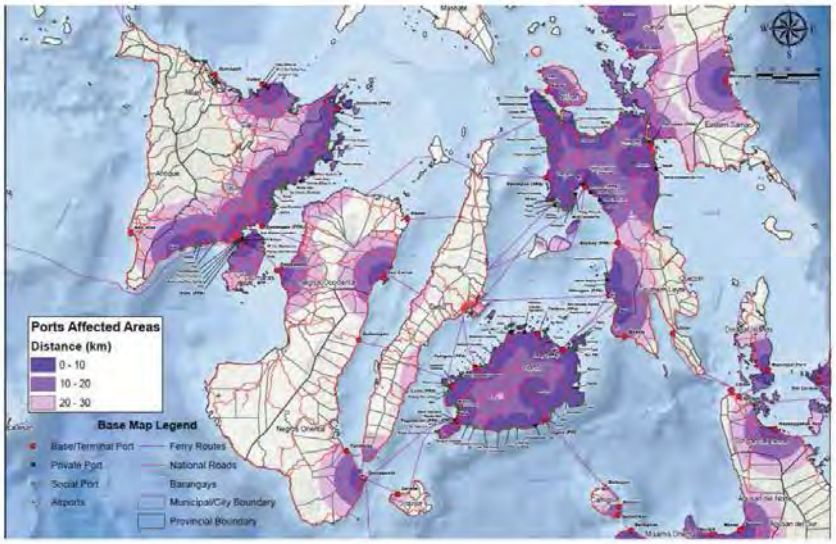
SHIMADA/JICA * OCDI 14

3-8 Ports and Poverty Incidence



SHIMADA/JICA * OCDI 15

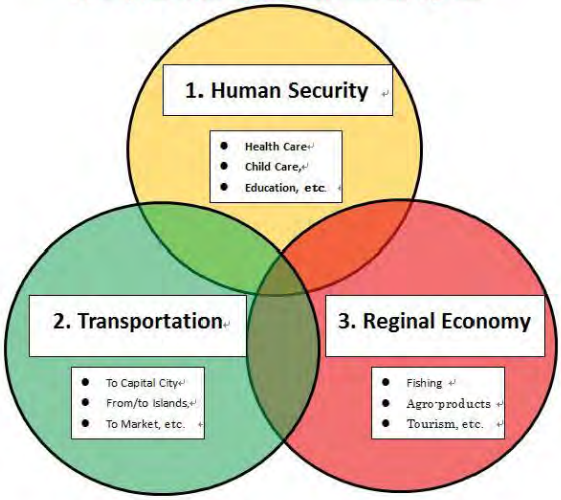
3-9 Ports Density



SHIMADA/JICA * OCDI 16

4-1 Basic Concept of Social Port

to support daily and community life



SHIMADA/JICA＊OCDI 17

4-2 Screening Criteria based on Basic Concept of Social Port

1. Human Security

a. Municipality Income Grade
b. Poverty Incident
c. Distance from Province Capital

2. Transportation

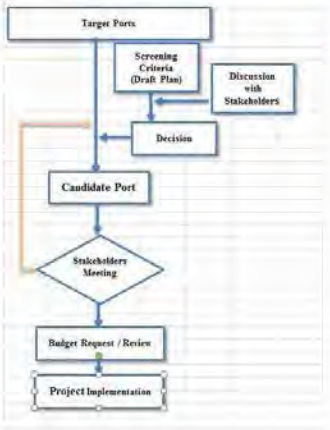
a. Connection to Island or Isolated Area
b. Distance from Neighbor Ports
c. Distance from National Highway

3. Reginal Economy

a. Population of Municipality
b. Port Scale

SHIMADA/JICA＊OCDI 18

4-3 Screening Flow for Selection of Social Ports



Preliminary Screening

- ✓ **Municipality and DoTC Discussion**

Secondary Screening

Absolute Requirements

- ✓ **DoTC Official Meeting**
- ✓ **Other Opinion Relevant Authorities**
- ✓ **Provincial Development Committee**

4-4
5 Criteria for Preliminary Screening

1. Number of Public Ports in Municipality (0 or 1) is prioritized excluding isolated island.
2. Municipality Income Class 1 should be excluded.
3. No Investment by DOTC and PPA during latest 3 years excluding phased project.
4. No ODA investment in the past basically
5. Poverty incidence (More than 30%)

4-4 5 Secondary Criteria to Prioritize considering Area Characteristics

1. Beneficiary Population (more 25,000)
2. Distance to Neighbor Port (more than 10km)
3. Distance to NHW (more than 10 km)
4. Purpose of Investment (Connection to/ from Isolated Island is prioritized)
5. Distance to Provencal Capital (more than 50km is prioritized)
6. Water depth (more than 4m above MSL)

SHIMADA/JICA × OCDI 21

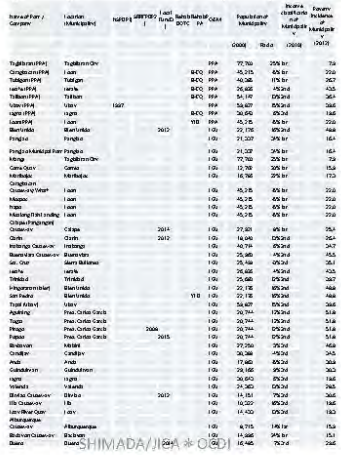
4-6 Absolute Requirements

1. Project site is not in a preserved/protected area (DENR definition) to ensure minimal impact to marine environment.
2. LGU has the right of way and land ownership of the project site
3. LGU has the commitment allocate budget to operate and maintain the port
4. Community organization has been established for the port operation and maintenance (e.g. port manager, port tariff collecting personnel)

SHIMADA/JICA × OCDI 22

5-1 Screening Data

Name of Port / Company	Location (Municipality)	NSPDP 1)	SRRFPD P2)	Local Fund 3)	Rehab DOT C	Rehab PPA	O&M	Population of Municipality		Income classification of Municipality	Poverty Incidence of Municipality (2012)
								(2000)	Ratio	(2010)	



SHIMADA/JICA * OCDI

23

5-2 Result of Trial Screening in Iloilo

3 ports are screened out and 2 ports are prioritized by secondary criteria.

Carles	Carles
Batad	Batad
San Dionisio	San Dionisio

SHIMADA/JICA * OCDI

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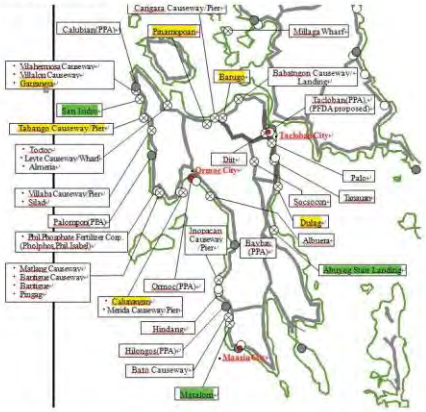
5-3 Result of Trial Screening in Leyte

9 ports are screened out and 3 ports are prioritized by secondary criteria.

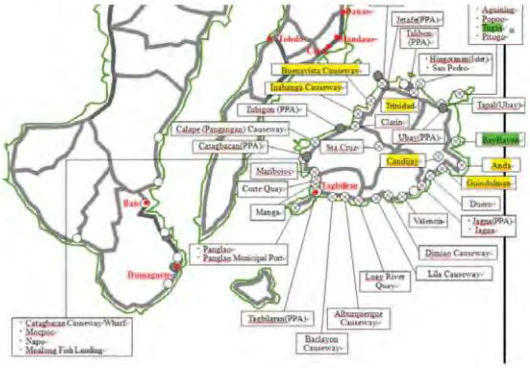
Garganera	Calubian
Pinamopoan	Capoocan
Barugo	Barugo
Dulag	Dulag
Abuyog Stair Landing	Abuyog
San Isidro	San Isidro
Tabango Causeway/Pier	Tabango
Calunangan	Merida
Matalom	Matalom

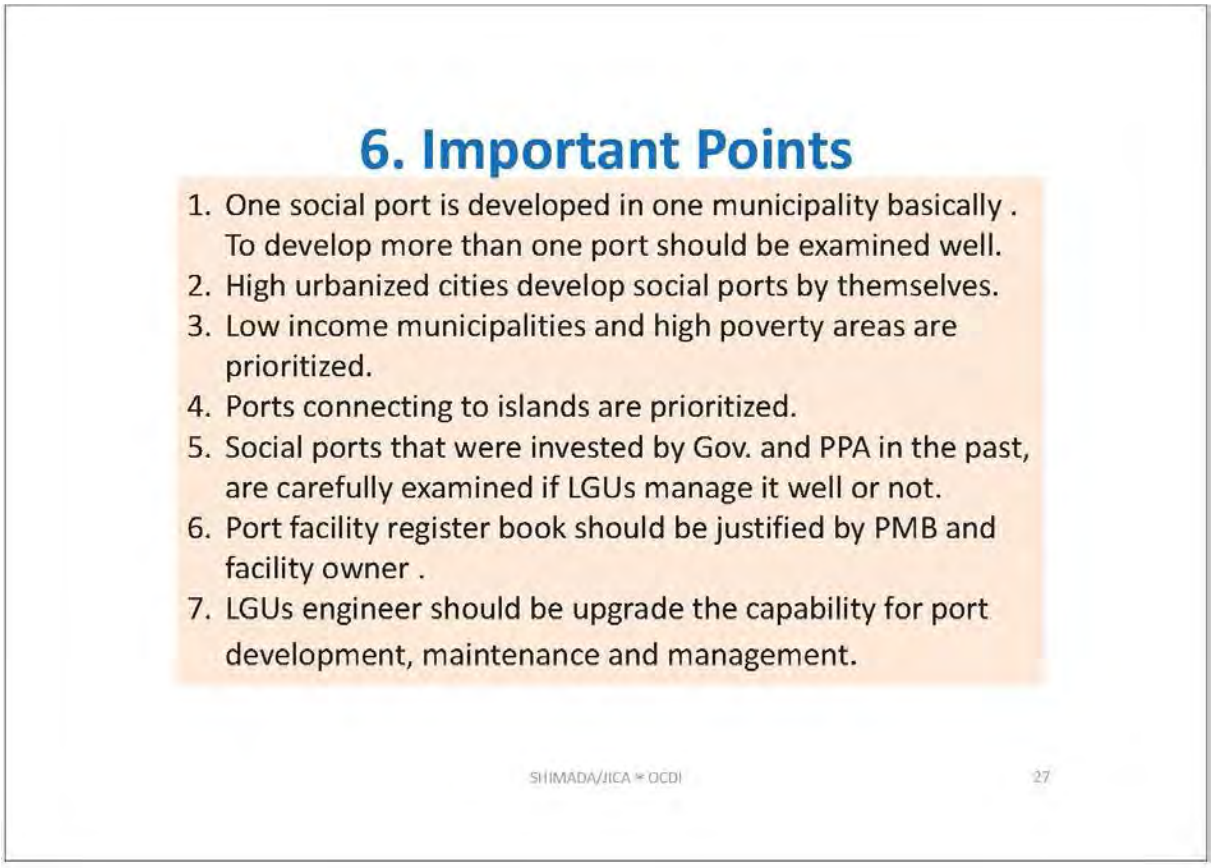


5-5 Result of Trial Screening in Bohol

8 ports are screened out and 2 ports are prioritized by secondary criteria.

Inabanga Causeway	Inabanga
Buenavista Causeway	Buenavista
Trinidad	Trinidad
Tugas	Pres. Carlos Garcia
Baybayon	Mabini
Candijay	Candijay
Anda	Anda
Guindulman	Guindulman




6. Important Points
1. One social port is developed in one municipality basically . To develop more than one port should be examined well.
2. High urbanized cities develop social ports by themselves.
3. Low income municipalities and high poverty areas are prioritized.
4. Ports connecting to islands are prioritized.
5. Social ports that were invested by Gov. and PPA in the past, are carefully examined if LGUs manage it well or not.
6. Port facility register book should be justified by PMB and facility owner .
7. LGUs engineer should be upgrade the capability for port development, maintenance and management.
SHIMADA/JICA * OCDI
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2) Features of Transportation Through Ports in the Target Area

Features of transportation through ports in the target area

- Contents -

1. The specification of target ports
2. The cargo flow of target ports
3. The logistics network in target area
4. Handling of "Fuel and By-products"
5. Finding

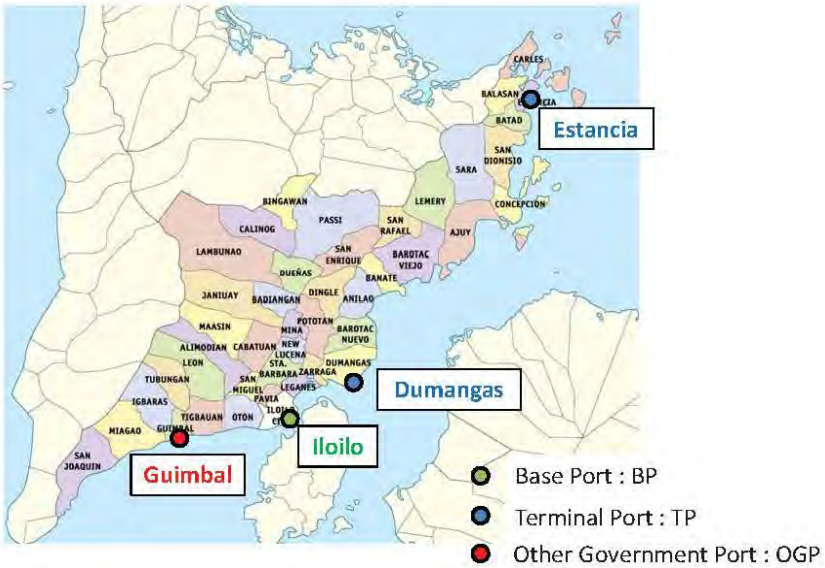
Source

1. Annual Port Statistics Data (PPA) CY 2012, 2013, 2014
   http://www.ppa.com.ph/ppa%20web/portstat.htm
2. Monthly Port Statistics Data (PPA) CY2014
   PMO-Iloilo, PMO-Tagbilaran, PMO-Ormoc/ Tacloban

1

1. The specification of target ports

1-1. ILOILO : PMO-Iloilo



2

1. The specification of target ports

Total Cargo Throughput (CY2014)

Domestic (Inbound/Outbound)

	Name of Ports		Vol. of Cargo(m.t)	
1	Iloilo	BP	2,621,697	A
2	Bulk Cement	Priv.	147,723	
3	Petron	Priv.	127,002	
4	Milagrosa	Priv.	48,539	
5	Dumangas	OGP	38,199	B
	.....			
		Total	3,021,511	C

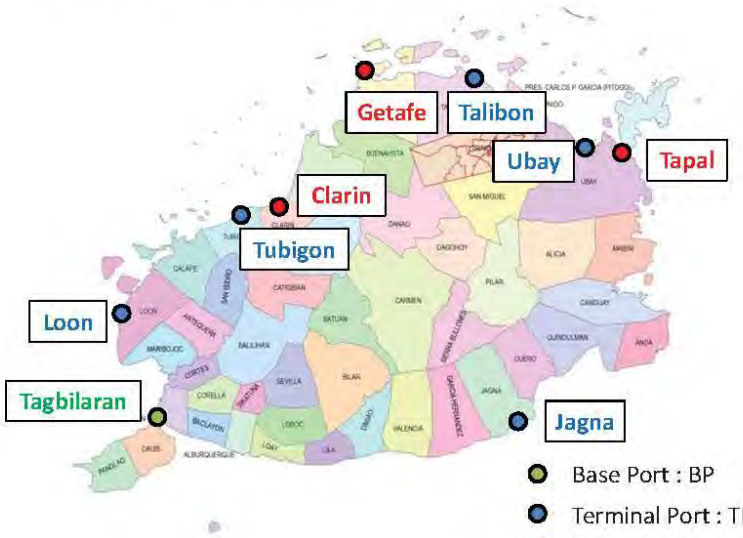
Iloilo (BP) / Dumangas = A / B = x 68.6

Iloilo (BP) / Total = A / C = 86.7%

3

1. The specification of target ports

1-2. BOHOL : PMO-Tagbilaran



4

1. The specification of target ports

Total Cargo Throughput (CY2014)

Domestic (Inbound/Outbound)

	Name of Ports		Vol. of Cargo(m.t)	
1	Tagbilaran	BP	1,286,778	A
2	Tubigon	TP	114,475	B
3	Ubay	TP	100,530	
4	Tapal	OGP	80,608	
5	Jagna	TP	74,452	
	.....			
		Total	3,008,883	C

Tagbilaran (BP) / Tubigon = A / B = x 11.2

Tagbilaran (BP) / Total = A / C = 42.8%

5

1. The specification of target ports

1-3. LEYTE : PMO-Ormoc/Tacloban

6

1. The specification of target ports

Total Cargo Throughput (CY2014)

Domestic (Inbound/Outbound)

	Name of Ports		Vol. of Cargo(m.t)	
1	Tacloban (TAC)	BP	741,956	A
2	Ormoc (ORM)	BP	440,862	
3	Pasar (ORM)	Priv.	348,156	
4	Philphos (ORM)	Priv.	224,798	
5	Bato (ORM)	OGP	171,045	B
	.....			
		Total	2,708,238	C

Ormoc+Tacloban (BP) / Bato = A / B = x 6.9

Ormoc+Tacloban (BP) / Total = A / B = 43.7%

PMO - Ormoc : ORM

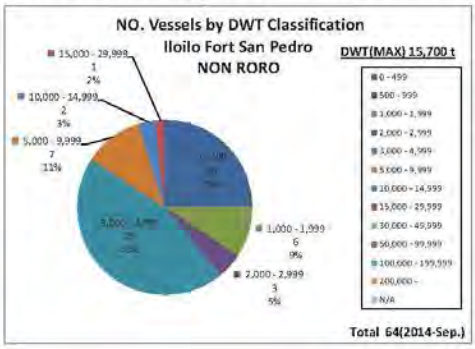
PMO - Tacloban : TAC

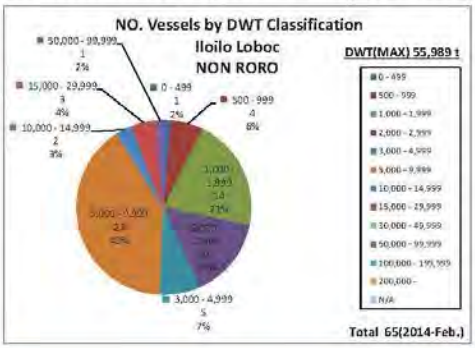
7

1. The specification of target ports

1-4. Iloilo (BP) : Iloilo

No. Vessels by DWT Classification and Draft (2014-Sep./Feb.)





	Draft (m)	
	Arrival	Depature
Average	4.76	4.27
Max	7.35	7.30

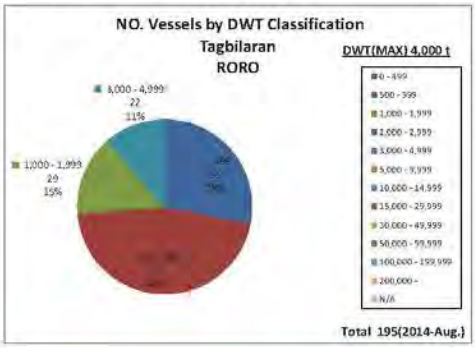
	Draft (m)	
	Arrival	Depature
Average	4.88	4.06
Max	6.66	6.70

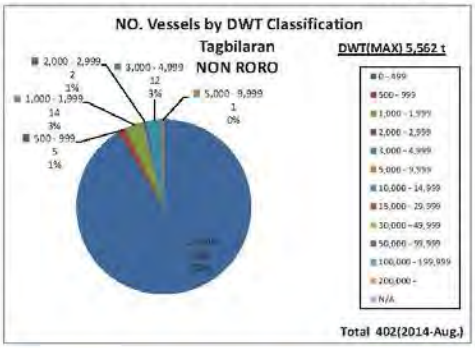
8

1. The specification of target ports

1-5. Tagbilaran (BP) : Bohol

No. Vessels by DWT Classification and Draft (2014-Aug.)





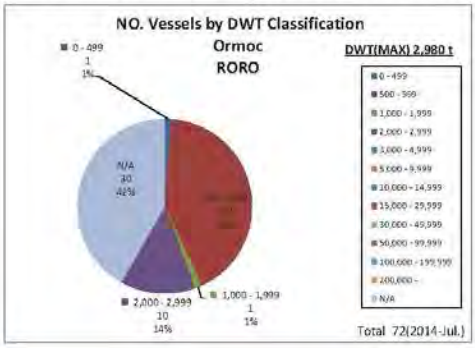
	Draft (m)	
	Arrival	Depature
Average	2.49	2.37
Max	9.00	4.40

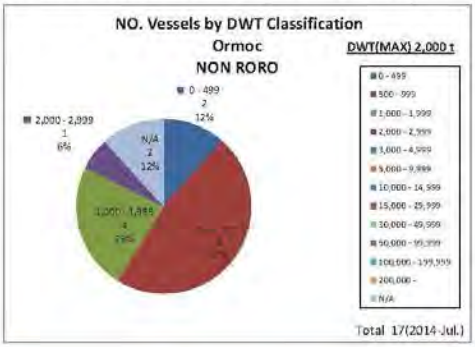
	Draft (m)	
	Arrival	Depature
Average	1.86	1.81
Max	6.20	7.00

1. The specification of target ports

1-6. Ormoc (BP) : Leyte

No. Vessels by DWT Classification and Draft (2014-Jul.)





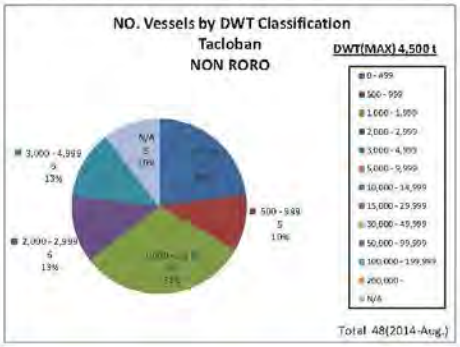
	Draft (m)	
	Arrival	Depature
Average	3.53	3.37
Max	5.50	5.00

	Draft (m)	
	Arrival	Depature
Average	3.16	1.81
Max	4.90	4.20

1. The specification of target ports

1-7. Tacloban (BP) : Leyte

No. Vessels by DWT Classification and Draft (2014-Aug.)



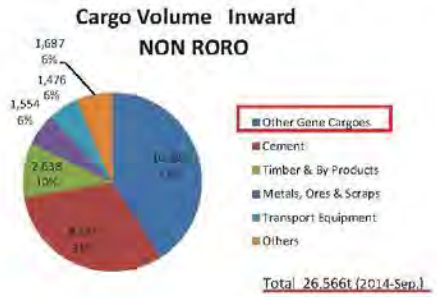
	Draft (m)	
	Arrival	Depature
Average	4.22	2.98
Max	11.00	5.50

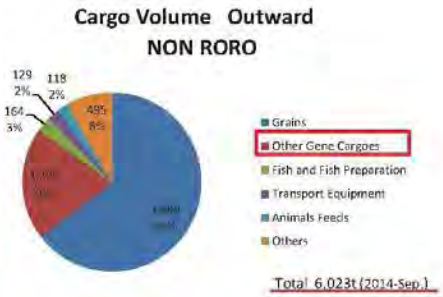
2. The cargo flow of target ports

2-1. Iloilo - FORT SAN PEDRO (BP) : Iloilo

Monthly Cargo Volume (2014-Sep.)

FORT SAN PEDRO





- In each case, the share of "Other Gene. Cargo" ranges between 20% and 30%

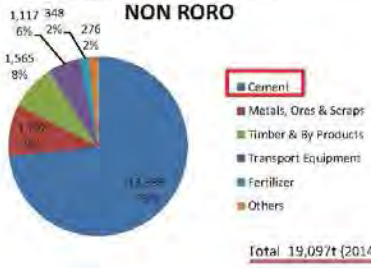
2. The cargo flow of target ports

2-2. Iloilo – Loboc (BP) : Iloilo

Monthly Cargo Volume (2014-Feb.)

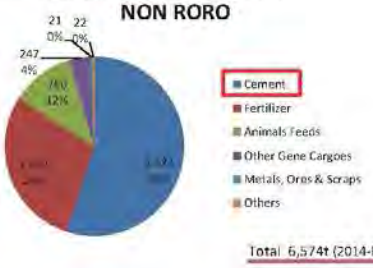
Iloilo Commercial Port Complex-Loboc

Cargo Volume Inward NON RORO



Total 19,097t (2014-Feb.)

Cargo Volume Outward NON RORO



Total 6,574t (2014-Feb.)

- In each case, the share of "Cement" is over 50%

13

2. The cargo flow of target ports

2-3. Tagbilaran (TP) : Bohol

Monthly Cargo Volume (2014-Aug.)

Cargo Volume Inward RORO/NON RORO

Total 38,682t (2014-Aug.)

Cargo Volume Outward RORO/NON RORO

Total 3,536t (2014-Aug.)

- In each case, the share of "Other Gene. Cargo" is significant
- Outward: The share of "Bottled Cargoes" is over 50%

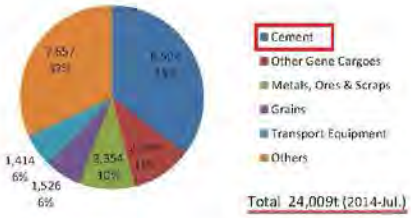
14

2. The cargo flow of target ports

2-4. Ormoc (BP) : Leyte

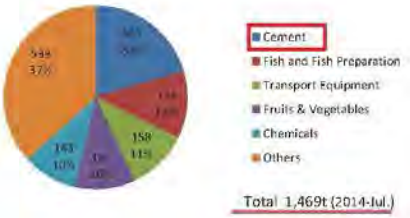
Monthly Cargo Volume (2014-Jul.)

Cargo Volume Inward RORO/NON RORO



Total 24,009t (2014-Jul.)

Cargo Volume Outward RORO/NON RORO



Total 1,469t (2014-Jul.)

- In each case, the share of "Cement" is significant
- Inward / Outward = 24,009t / 1,469t=16.3

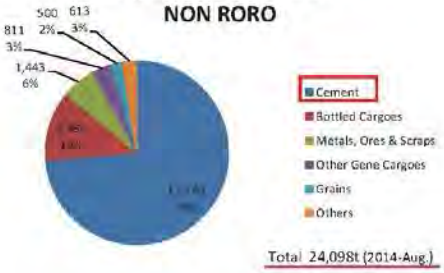
15

2. The cargo flow of target ports

2-5. Tacloban (BP) : Leyte

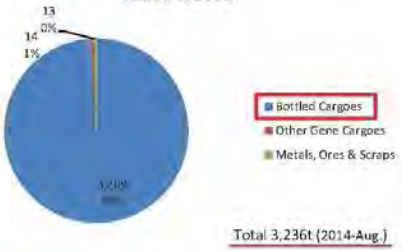
Monthly Cargo Volume (2014-Aug.)

Cargo Volume Inward NON RORO



Total 24,098t (2014-Aug.)

Cargo Volume Outward NON RORO



Total 3,236t (2014-Aug.)

- Inward: The share of "Cement" materials is significant
- Outward: "Bottled Cargoes" account for almost 100% of the total

16

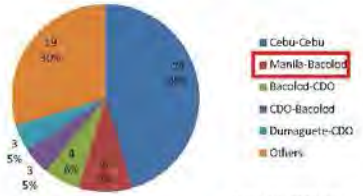
3. The logistics network in target area

3-1. Iloilo (BP) : Iloilo

Number of Vessels (2014-Sep./Feb.)

FORT SAN PEDRO

No. of Vessels NON RORO(Domestic)
Ports of Call(Last - Next)



Total 64 (2014-Sep.)

Iloilo Commercial Port Complex-Loboc

No. of Vessels NON RORO(Domestic)
Ports of Call(Last - Next)

Total 65 (2014-Feb.)

- Some NON RORO vessels are in service between long-distance ports (e.g. Manila, Zamboanga)

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3. The logistics network in target area

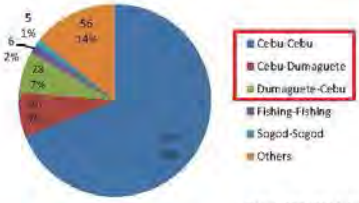
3-2. Tagbilaran (TP) : Bohol

Number of Vessels (2014-Aug.)

No. of Vessels RORO(Domestic)
Ports of Call(Last - Next)

Total 195 (2014-Aug.)

No. of Vessels NON RORO(Domestic)
Ports of Call(Last - Next)



Total 402 (2014-Aug.)

- In each case, many vessels are engaged in services that link with Cebu

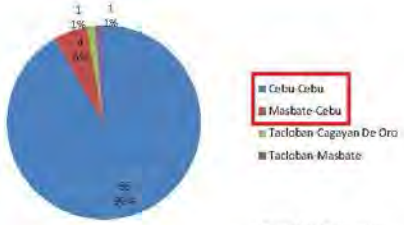
18

3. The logistics network in target area

3-3. Ormoc (BP) : Leyte

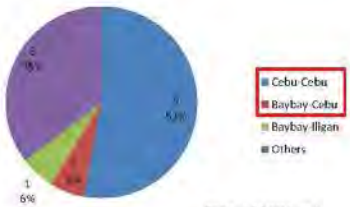
Number of Vessels (2014-Jul.)

No. of Vessels RORO(Domestic)
Ports of Call(Last - Next)



Total 72 (2014-Jul.)

No. of Vessels NON RORO(Domestic)
Ports of Call(Last - Next)



Total 17 (2014-Jul.)

- In each case, many vessels are engaged in services that link with Cebu

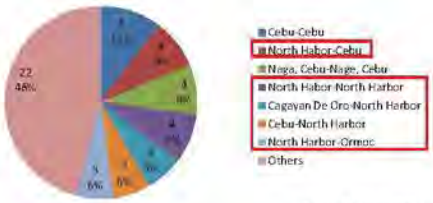
10

3. The logistics network in target area

3-4. Tacloban (BP) : Leyte

Number of Vessels (2014-Aug.)

No. of Vessels NON RORO(Domestic)
Ports of Call(Last - Next)



Total 48 (2014-Aug.)

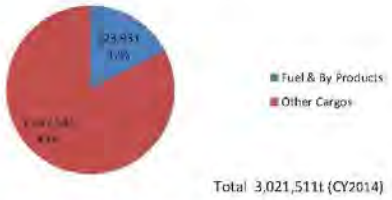
- Sea lanes are dispersed in Visayas and beyond
- Some NON RORO vessels are in service between long-distance ports (e.g. Manila)

20

4. Handling of "Fuel and By-products"

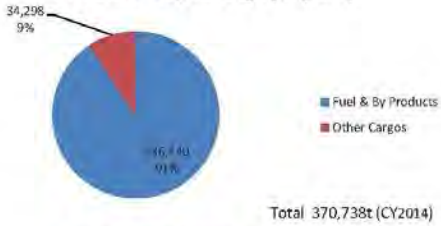
4-1. ILOILO LOBOC, PRYSE GASES (Priv.): PMO-Iloilo

Cargo Volume(2014)
PMO:ILOILO, Domestic(Inbound)



Total 3,021,511t (CY2014)

Cargo Volume(2014)
PMO:ILOILO, Foreign(Import)

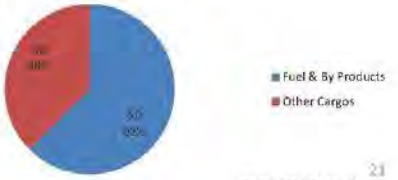


Total 370,738t (CY2014)

Number of Vessels(2014)
PMO:ILOILO, Domestic(Inbound)

Total 18,552 (CY2014)

Number of Vessels(2014)
PMO:ILOILO, Foreign(Import)



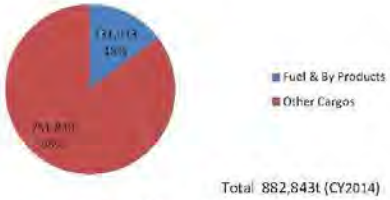
Total 80 (CY2014)

21

4. Handling of "Fuel and By-products"

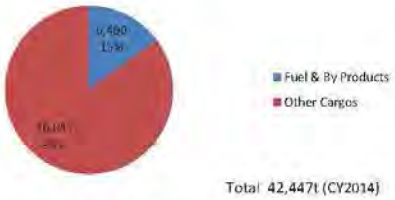
4-2. SHELL ANIBONG, PETRON, SUPREME STAR OIL (Priv.): PMO-Tacloban

Cargo Volume(2014)
PMO:TACLOBAN, Domestic(Inbound)



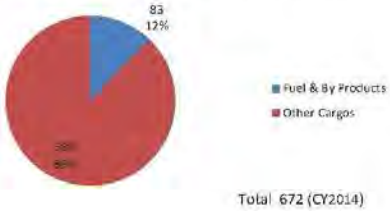
Total 882,843t (CY2014)

Cargo Volume(2014)
PMO:TACLOBAN, Foreign(Import)



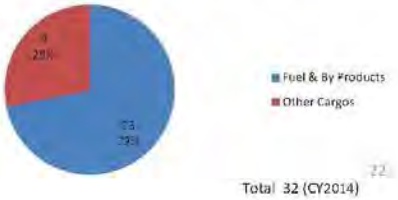
Total 42,447t (CY2014)

Number of Vessels(2014)
PMO:TACLOBAN, Domestic(Inbound)



Total 672 (CY2014)

Number of Vessels(2014)
PMO:TACLOBAN, Foreign(Import)



Total 32 (CY2014)

22

5. Finding

Finding-1

1. The specification of target ports

- There are one or two representative ports (BP) in each province
- The share (BP) of total cargo throughput in each province is as below;

  Iloilo 86.7%, Bohol 42.8%, Leyte 43.7%
- The cargo volume of each BP is much larger than total cargo volume of the other ports (TP, OGP) in province

  Iloilo x 68.6, Bohol x11.2, Leyte x6.9

5. Finding

Finding-2

2. The cargo flow of target ports

- Many cargoes are biased toward inbound, especially from Cebu
- Many cargoes are concentrated at Iloilo port in Iloilo Provinces
- Bohol Provinces receive a large volume of Cement and Other General Cargo from Cebu
- Ormoc Port and Tacloban Port handle a large proportion of cargo in Leyte Provinces

5. Finding

Finding-3

3. The logistics network in the target area

- Cebu is a significant logistics hub in Visayas
- Base Ports (Iloilo, Tagbilaran, Tacloban) in addition to Tapal Port (OGP) handle the cargo from extra-regional ports (e.g. Manila, Batangas)

5. Finding

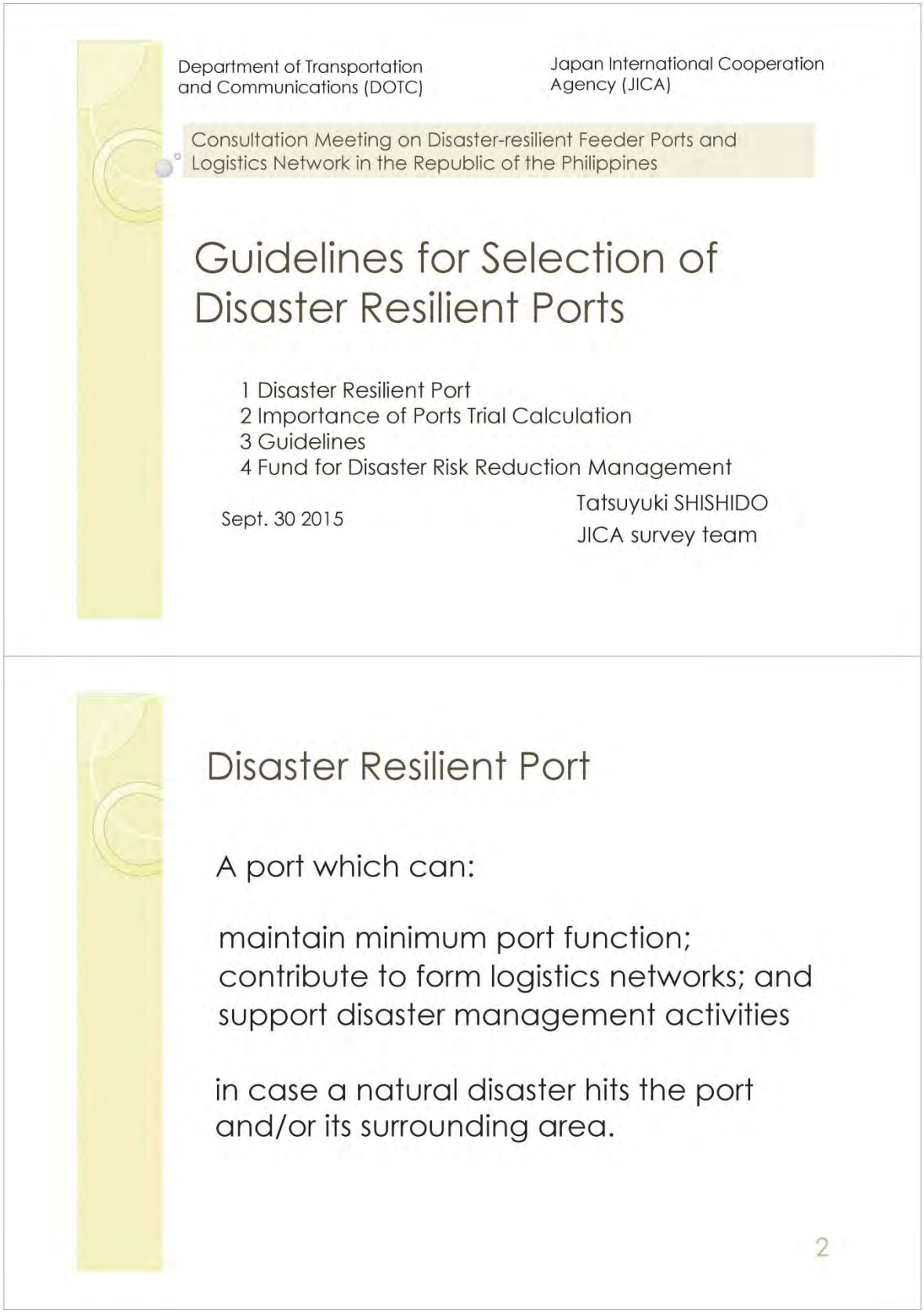
Finding-4

4. Handling of "Fuel and By-products"

- Fuel and By-products are unloaded at private ports (which is listed in the column of "Private port" and "PMO Iloilo or PMO Tacloban" in PPA Statistics)
- It occupies around 90% of imported volume at Iloilo Port


Thanks for your attention!
JICA Study Team
The Overseas Coastal Area Development Institute of Japan
Oriental Consultants Global Co., Ltd.
OCDI
OC GLOBAL

3) Tentative Draft for Discussion on Guidelines for Selecting Disaster Resilient Ports in Target Area



Requirement for a Disaster Resilient Port

- To support livelihoods and industry in damaged areas by providing port service early
  Livelihoods/industrial activity support function
- To play a role as hub of cargo transportation and passenger traffic
  Logistics function
- To contribute in forming alternative routes when land transportation routes are damaged
  Bypass function
- To provide space for disaster management activities immediately after a disaster
  Space-providing function

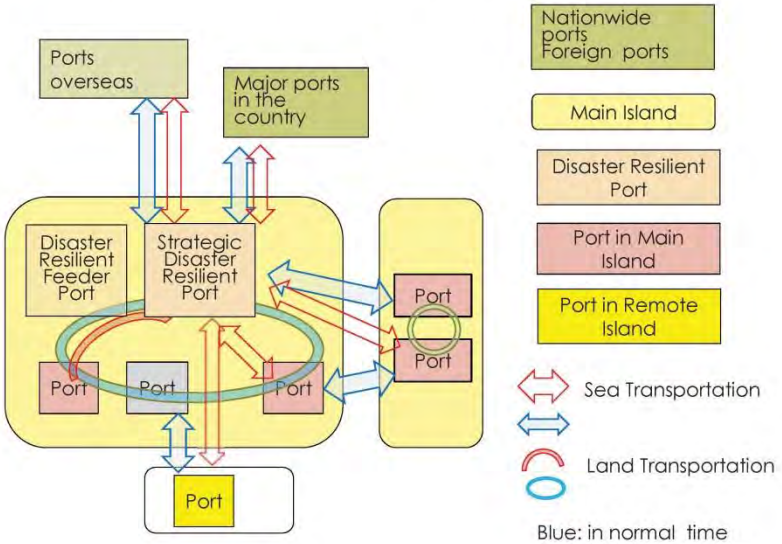
3

Basic Policy for the improvement of Disaster Resilient Ports

- One disaster resilient port shall be deployed in each province <**Strategic Disaster Resilient Port**>
- Port(s) other than the strategic disaster resilient port shall be enhanced against disasters according to importance from the viewpoint of disaster resilience. Number of the ports shall be decided considering population and economic activities in the Province. <**Disaster Resilient Feeder Port**>
- Small ports located along coastal lines and not damaged seriously may receive goods or persons transported by small boats from disaster resilient ports
- Relation to the ports in neighboring provinces shall be taken into consideration.

4

Image of Ports and Port Networks



5

Ports to be considered in the Target Area

Iloilo Province	1)	2)
Iloilo Port	PMO(BP)	BP
Dumangas Port	Under TMO	OGP
Estancia Port	Under TMO	TP
Guimbal Port	Under TMO	OGP

Bohol Province	1)	2)
Tagbilaran Port	PMO(BP)	BP
Tubigon Port	Under TMO	TP
Jetafe Port	Under TMO	TP
Tabilon Port	Under TMO	TP
Ubay Port	Under TMO	TP
Jagna Port	Under TMO	TP
Tapal Port	Under TMO	OGP
Loay Port	Under TMO	OGP

Leyte Province	1)	2)
Tacloban Port	PMO(BP)	BP
Ormoc Port	PMO(BP)	BP
Palampon Port	Under TMO	TP
San Isdro Port	Under TMO	TP
Baybay port	Under TMO	TP
Hlongos Port	Under TMO	TP
Isabel Port	Under TMO	OGP
Bato Port	-	OGP

1) PPA materials
2) PPA statistics

6

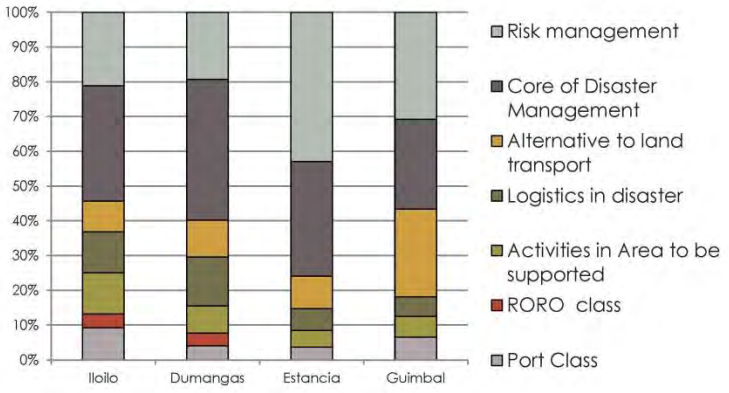
Method of Calculating the Degree of Importance

Logistics		0.1	
	Port Class	0.8	Masterplan study in 2004
	RORO class	0.2	Masterplan study in 2004
Disaster Resilient		0.9	
	Activities in Area to be supported	0.10	Population of municipality
			Cargo volume
	Logistics in disaster	0.10	Route from/to nationwide or foreign ports
			RORO Service Frequency
			Road in the Vicinity
	Alternative to land transport	0.10	Ports in the Province
			Traffic of Coastal Road behind the Port
	Core of Disaster Management	0.35	Maximum depth of Berth
			Area of Port
			Port Management
			Location at Disaster Management Center
			Building in the port area
	Risk management	0.35	Degree of Disaster Risk
			Existence of Alternative Ports
			Location from the Representative Port

7

Numerical results -Ports in Iloilo Province

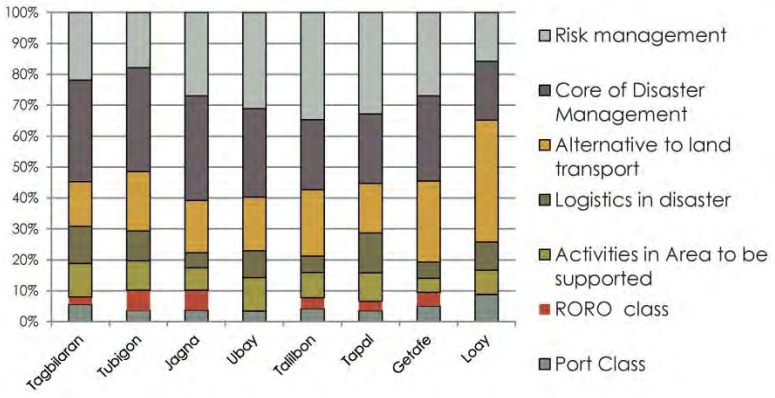
Iloilo	Dumangas	Estancia	Guimbal
8	4	5	3



8

Numerical Results -Ports in Bohol Province

Tagbilaran	Tubigon	Jagna	Ubay	Talilbon	Tapal	Getafe	Loay
6	5	5	5	4	5	3	3

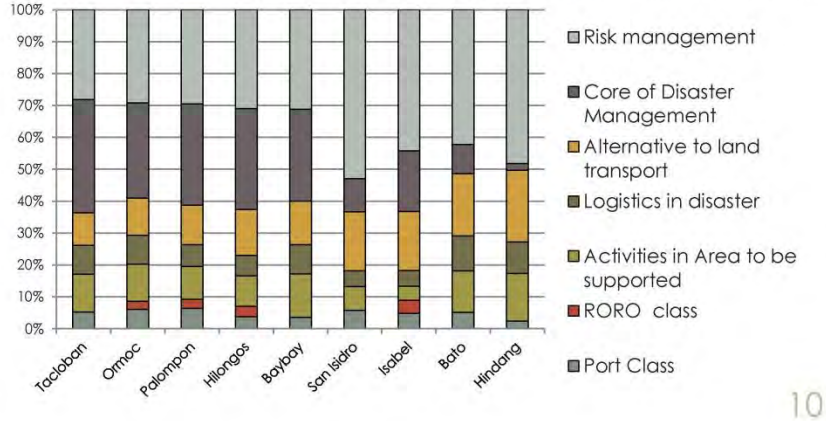


9

Numerical Results -Ports in Leyte Province

Tacloban	Ormoc	Palompon	Hilongos	Baybay	San Isidro	Isabel	Bato*)
7	6	5	5	5	4	3	3

*) data on several items could not be obtained



10

Assessing the Numerical Results

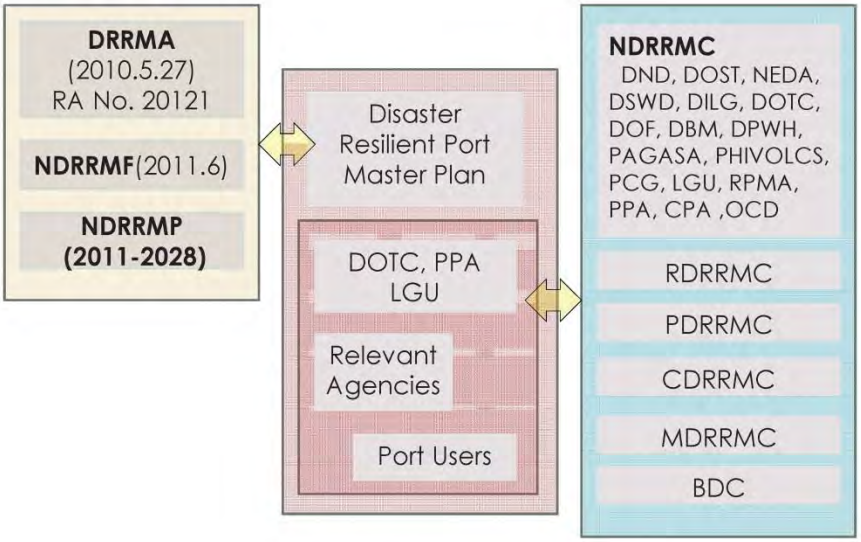
Prov.	Strategic Disaster Resilient Port	Candidate Disaster Resilient Feeder Port	Points in assessing the numerical result
Iloilo	**Iloilo**	**Estancia**	Relation to neighboring Prov.
Bohol	**Tagbilaran**	**Tapal**, Jagna Ubay, Tubigon	Investment cost Natural conditions Location
Leyte	**Tacloban**	**Ormoc**	Location (west/East)

11

Measures to be taken in a Disaster Resilient Port

Pre-Disaster Phase	Immediately before and during Disaster Phase	Post Disaster Phase
Physical Measures		
- Disaster resilient port master planning - Construction of disaster resilient port facilities	- Temporary strengthening for approaching typhoon - Installation of facilities for emergency operation as necessary	-Procurement of facilities for provisional use of damaged facilities - Rehabilitation of damaged facilities
Non-physical		
- Disaster resilient port master Planning - Preparing management and operation system in emergency - Drill	- Preparation for approaching typhoon - Survey of damaged facilities - Port management and operation in emergency	- Port management and operation in the stage of provisional use - Preparing Restoration Plan

Consistency with Government Policy



Draft Skelton of Guidelines

1. Introduction
   - Role of ports in time of disaster
   - Damages caused by disasters
2. Evaluation of the degree of importance
   - 2-1 Preliminary selection of Target Ports
     - Calculation of the degree of importance
   - 2-2 Assessing Numerical Results
     - Engineering aspect
     - Economic/financial aspect
     - Social/Environmental aspect
3. Coordination with stakeholders
   - 3.1 Port users and related persons
   - 3.2 Relevant agencies
   - 3.3 Designation of Disaster Resilient Ports

Funds related to Disaster Reduction and Management

National Disaster Risk Reduction and Management Fund 1), 2) NDRRMF

- -Lump sum fund to cover aid, relief, and rehabilitation services to communities/areas affected by calamities, repair and reconstruction of permanent structures, including capital expenditures for pre-disaster operations, rehabilitation and other related activities.
- -Approval of Office of President (PO) based on Recommendation of the National Disaster and Risk Reduction and Management Council (NDRRMC)
- -"Yolanda Comprehensive Rehabilitation and recovery Plan" is added in 2016

Quick Response Fund 1), 2) QRF

- -Built-in budgetary allocations that represent pre-disaster or standby funds for agencies in order to immediately assist areas stricken by catastrophes and crises.
- -The built-in QRFs to ensure immediate action during calamities

Disaster Management Assistance Fund (DMAF) /MDFO-PGB 3) DMAF

- -Financing support to mitigation and prevention, response and relief, and recovery and rehabilitation initiatives
- -Loan conditions depends on eligible subject and category of LGUs

Source:
1) Investing in the Right Priorities (The 2106 Budget Priorities Framework): DBM
2) Website of DBM <http://www.dbm.gov.ph/?page_id=8427#Nature>
3) Leaflet of Disaster Management Assistance Fund: MUNICIPAL DEVELOPMENT FUND OFFICE, Department of Finance

Particulars	2015	2016
National Disaster Risk Reduction and Management Fund	14,000	38,896
National Disaster Risk Reduction and Management Program (Calamity Fund)	13,000	19,000
Peoples survival Fund	1,000	1,000
Yonlada Comprehensive rehabilitation and Recovery Plan		18,896
Quick Response Fund	6,708	6,665
DA-OSEC	500	500
DepEd	1,00	1,000
DOH	500	510
DND-OCD	530	530
DPWH	1,000	1,300
DSWD	1,325	1,325
DOTC	1,000	1,000
N/A	500	500

Source: Investing in the Right Priorities (The 2106 Budget Priorities Framework): DBM

Financial Resources

	Government-owned facilities	Local Government-owned facilities	GOCC-owned facilities
Disaster resilient port facility construction	NDRRMF, GAA	LDRRMF, LGU's Budget, DMAF	GOCC's fund, NDRRMF
Reinforcement for Provisional Use	QRF, NDRRMF	LDRRMF, LGU's Budget, DMAF	GOCC's fund, NDRRMF
Rehabilitation of Damaged Facilities	QRF, NDRRMF, GAA	LDRRMF, LGU's Budget, DMAF	GOCC's fund, NDRRMF

Note:
1) Donor fund may be applied according to donor's policy
2) Budgets for disaster resilient port master planning and operational cost which is necessary for disaster management shall be required. The fund in the table can be applied to the budget
3) DOTC or PPA may financially support to LGUs in case of serious damages as necessary

Rehabilitation of Port Facilities

Rehabilitation of facilities damaged by Yolanda (DOTC)

Port	Amount (P)	Fund
21 ports 32 spots	329,600,000.00	Government Fund
15 ports 22 spots	248,600,000.00	QRF 2014
6 ports 10 spots	81,000,000.00	RRF

Source: PDS/DOTC

Rehabilitation of facilities damaged by Bohol Earthquake (PPA)

Port	Amount (P)	Fund
Tagbiralan, Tubigon, Talibon, Jetafe, Catagbacan	558,635,602.70	PPA Corporate fund

Source: PPA

REF: Budget for port in GAA (2015 in Peso)

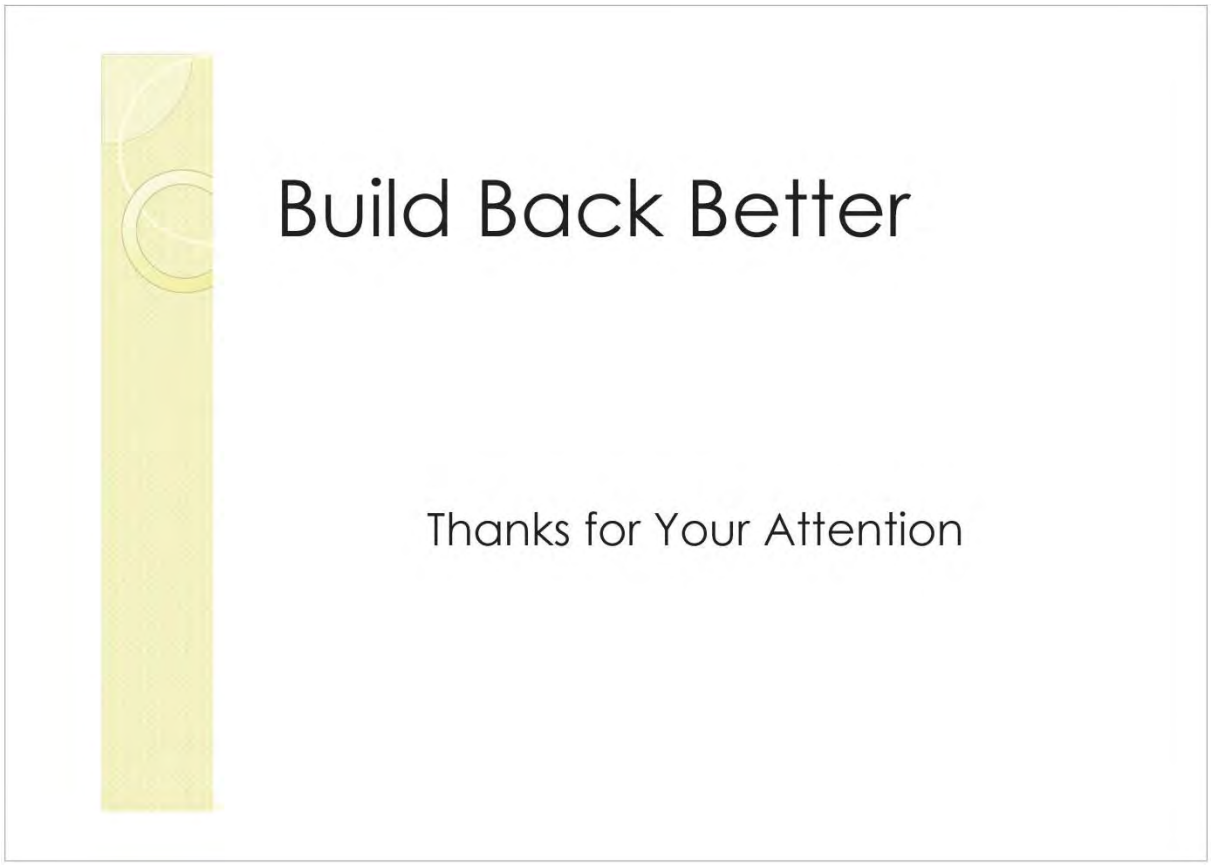
DOTC	**45,945,422,000**
Program	6,541,184,000
Project	39,404,238,000
Foreign assisted Project(s)	10,516, 754,000
Locally-Funded Project(s)	28,887,484,,000
Non Road Transportation	20,573,070,000
Ports, Lighthouses and Harbors	**1,631,453,000**

Source: GAA 2015

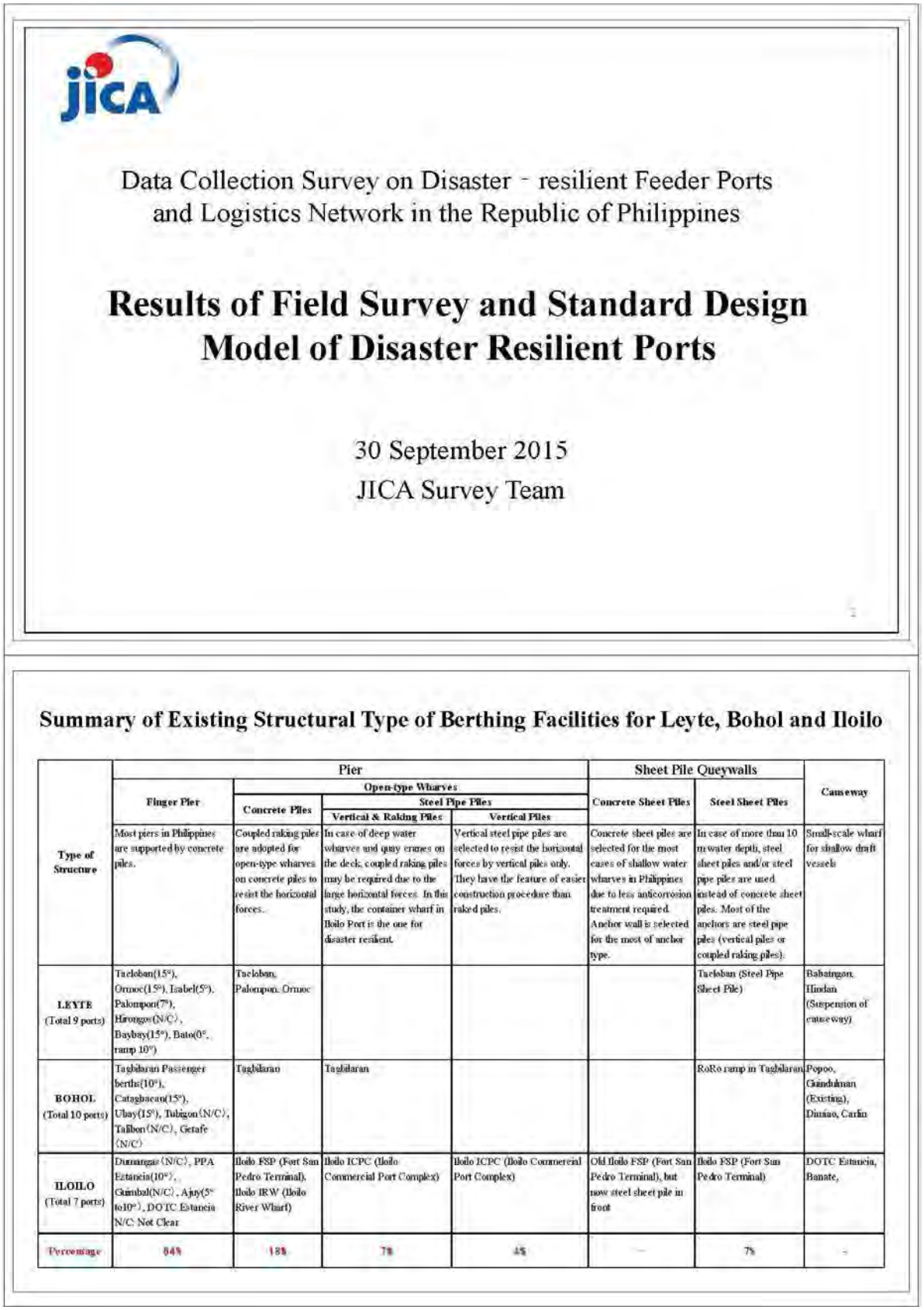
Ports, Lighthouses and Harbors

Year	Budget (1.000P)	Number of Spots
2012 [1)2)]	502,000	82
2013 [1)2)]	217,500	9
2014 [1)2)]	1,079,500	44
2015 [2)]	1,631,453	63
2016 [2)*]	1,031,500	37

* Proposal amount
Source:1) Website of DOTC , 2) WTPD


Build Back Better
Thanks for Your Attention

4) Tentative Draft for Discussion on Standard Design Models of Disaster Resilient Port Facilities



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

Results of Field Survey and Standard Design Model of Disaster Resilient Ports

30 September 2015

JICA Survey Team

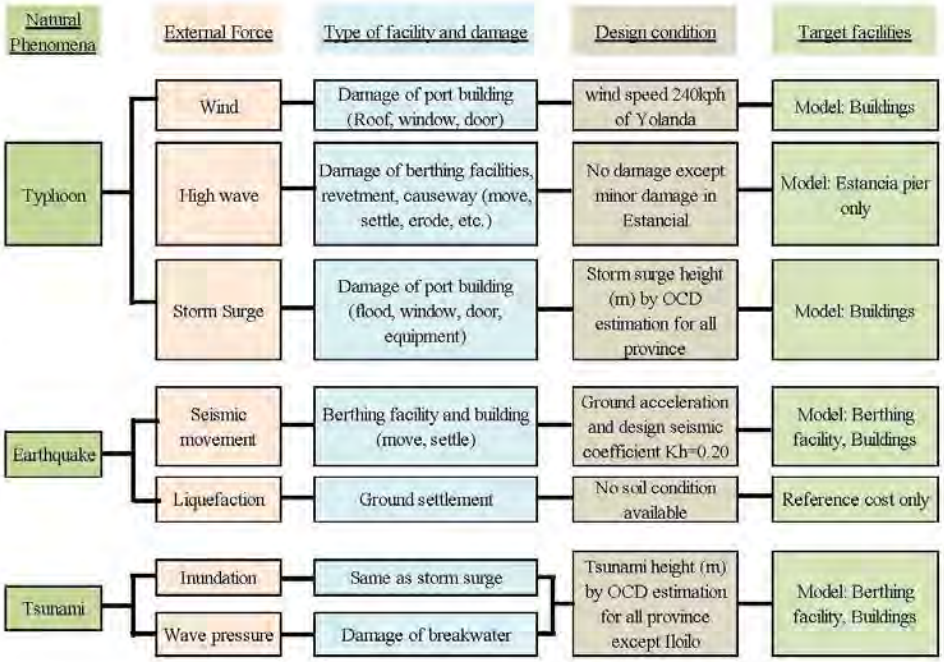
Summary of Existing Structural Type of Berthing Facilities for Leyte, Bohol and Iloilo

	Pier				Sheet Pile Quaywalls		Causeway
	Finger Pier	Open-type Wharves			Concrete Sheet Piles	Steel Sheet Piles	
		Concrete Piles	Steel Pipe Piles				
			Vertical & Raking Piles	Vertical Piles			
Type of Structure	Most piers in Philippines are supported by concrete piles.	Coupled raking piles are adopted for open-type wharves on concrete piles to resist the horizontal forces.	In case of deep water wharves and quay cranes on the deck, coupled raking piles may be required due to the large horizontal forces. In this study, the container wharf in Iloilo Port is the one for disaster resilient.	Vertical steel pipe piles are selected to resist the horizontal forces by vertical piles only. They have the feature of easier construction procedure than raked piles.	Concrete sheet piles are selected for the most cases of shallow water wharves in Philippines due to less anticorrosion treatment required. Anchor wall is selected for the most of anchor type.	In case of more than 10 m water depth, steel sheet piles and/or steel pipe piles are used instead of concrete sheet piles. Most of the anchors are steel pipe piles (vertical piles or coupled raking piles).	Small-scale wharf for shallow draft vessels
LEYTE (Total 9 ports)	Tacloban(15°), Ormoc(15°), Isabel(5°), Palompon(7°), Hirongos(N/C), Baybay(15°), Bato(0°, ramp 10°)	Tacloban, Palompon, Ormoc				Tacloban (Steel Pipe Sheet Pile)	Babatngon, Hindan (Suspension of causeway)
BOHOL (Total 10 ports)	Tagbilaran Passenger berths(10°), Catagbacan(15°), Ubay(15°), Tubigon(N/C), Talibon(N/C), Getafe (N/C)	Tagbilaran	Tagbilaran			RoRo ramp in Tagbilaran	Popoo, Guindulman (Existing), Dimiao, Carlin
ILOILO (Total 7 ports)	Dumangas (N/C), PPA Estancia(10°), Guimbal(N/C), Ajuy(5° to10°), DOTC Estancia N/C: Not Clear	Iloilo FSP (Fort San Pedro Terminal), Iloilo IRW (Iloilo River Wharf)	Iloilo ICPC (Iloilo Commercial Port Complex)	Iloilo ICPC (Iloilo Commercial Port Complex)	Old Iloilo FSP (Fort San Pedro Terminal), but now steel sheet pile in front	Iloilo FSP (Fort San Pedro Terminal)	DOTC Estancia, Banate,
Percentage	64%	18%	7%	4%	-	7%	-

Summary of Type and Area of Main Buildings for Disaster Resilient Six Ports

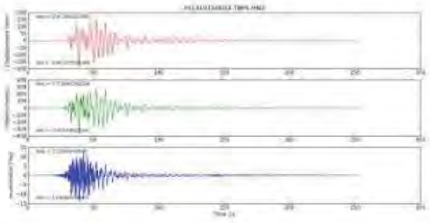
Name of buildings	Unit	TACLOBAN	ORMOC	TAGBILARAN	TAPAL	ILOILO (ICPC)	PPA ESTANCIA
Administration/ Office Building		RC Building w Roof Deck	RC Building w/ GI Roofing	Mixed Mat'ls w/ GI Roofing (Temporary)	RC Building w/ Roof Deck	RC Building w/ Roof Deck	RC Building w/ GI Roofing
		3 Storey	1 Storey	2 Storey	1 Storey	4 Storey	2 Storey
	m^2	686 x 3	281	261.45 x 2	30	435 x4	240 (2nd Flr. only)
CFS		None	None	None	None	RC Building w/ GI Roofing	None
						1 Storey	
	m^2					7467.4	
Warehouse		RC Building w/ GI Roofing	None	RC Building w/ GI Roofing	None	RC Building w/ GI Roofing	None
		1 Storey		1 Storey		1 Storey	
		540		300		1027.8	
Passenger Terminal Building		None	RC Building w/ GI Roofing	RC Building w Roof Deck	None	None	RC Building w/ GI Roofing
			1 Storey	2 Storey			2 Storey
	m^2		1,412	397 x 2			240 (Grnd Flr. only)

Considerable Damages by Natural Phenomena for Disaster Resilient Ports



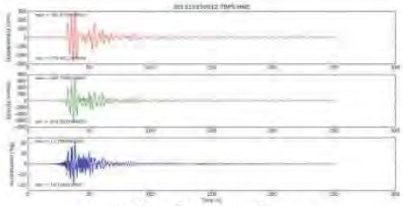
Design Condition of Earthquake (Bohol)

Vertical Movement



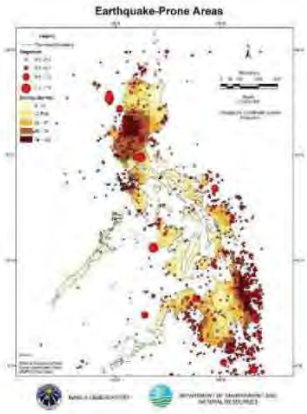
Horizontal Movement

Max. acceleration (214 gal)



Seismic waveform

Design seismic coefficient Kh=0.20



	Magnitude	Origin	Location	Date
1	7.9	Tectonic	Moro Gulf	August 16, 1976
2	7.8	Tectonic	Luzon Island	July 16, 1990
3	7.5	Tectonic	Luzon Island	November 30, 1645
4	7.6	Tectonic	Mindanao	March 31, 1955
5	7.3	Tectonic	Casiguran, Aurora	August 2, 1968
6	7.2	Tectonic	Bohol & Cebu	October 15, 2013
7	7.1	Tectonic	Mindoro	November 15, 1994
8	6.7	Tectonic	Negros Oriental	February 6, 2012
9	8.3	Tectonic	Panay (Lady Caycay)	January 25, 1948
10	*Unknown*	Tectonic	Manila	June 19, 1665

Big 10 Earthquake in the Philippine

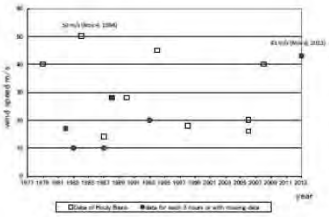
Design Condition of Typhoon (Yolanda)

Track of Yolanda November 2013

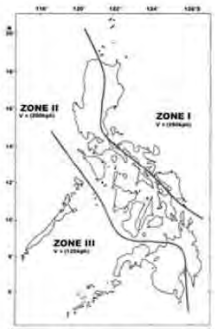
Wind speed of Yolanda (source PAGASA)

Based on the barograph, the lowest station pressure observed in Guiuan Station before the instrument was damaged by TY Yolanda was 910 hPa at 5:00AM, 08 November 2013. At this pressure, the equivalent **maximum sustained wind is 240kph**

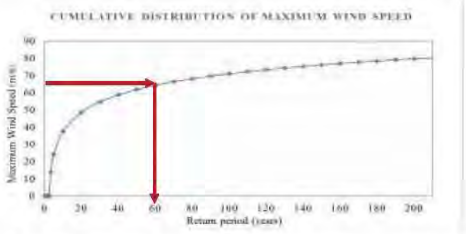
Design wind speed 240kph



Biggest wind velocity in the year from 1977 to 2013 at Guiuan

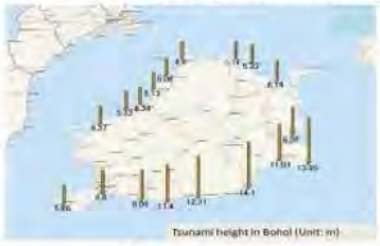


NSCP Design wind Speed



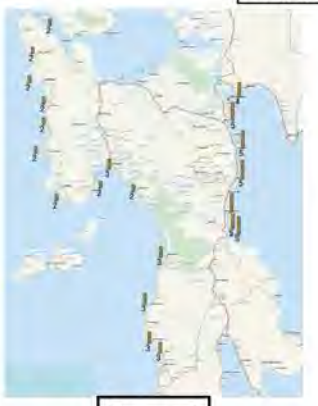
Provability Analysis for Typhoon Yolanda

Estimated Storm Surge and Tsunami Height (m) based on the Historical Record, Source OCD Ready Project



Tsunami

Storm Surge

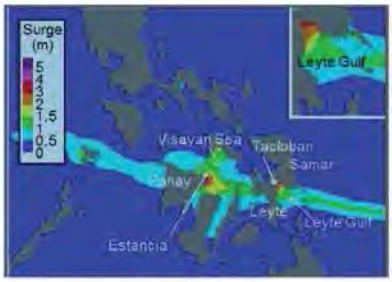


Tsunami

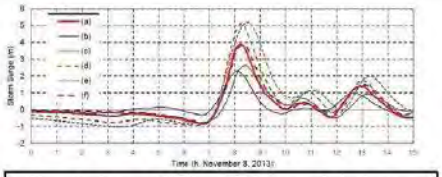
Storm Surge

Storm Surge

Design Condition of Storm Surge (Yolanda)

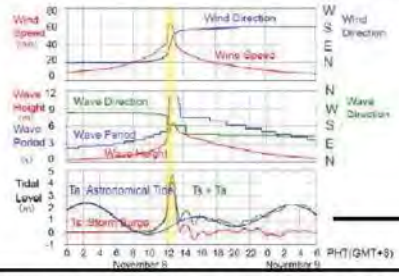


Height of Storm Surge by Yolanda



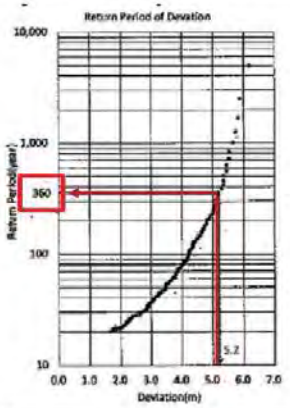
Simulation of Storm Surge at Tacloban

	Storm Surge by Yolanda	Design Storm Surge by OCD
Tacloban	4.00	3.42 (at Bgy. San Roque, Tanauan)
Estancia	4.00	3.86



Simulation with site survey data of wind speed, wave and Storm Surge at Estancia

National Institute for land and infrastructure Management Japan



Estimated Return Period of Storm Surge by Yolanda

Professor, Eric C. Cruz
D. Eng UP

Location of Disaster Resilient Port Facilities in Selected Six Ports

Tacloban

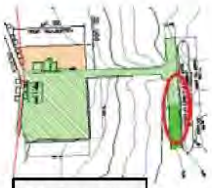
Ormoc

Tagbilaran

Tapal

Iloilo

:Location of SDM



Estancia

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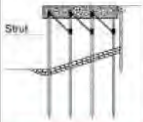
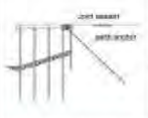
Typical Sections of Standard Design Model for Earthquake

	Case-1	Case-2	Case-3	Case-4	Case-5	Case-6	Case-7
Method	**Installation of Coupled Raking Piles in front of Berth line**	**Removal of Deck and Installation of Coupled Raking Piles**	**Removal of Deck and Installation of Submerged Struts**	**Installation of Tie Rod, Anchor Wall and Sealant**	**Installation of Ground Anchor and Joint Sealant**	**Installation of Submerged Steel Beams**	**Installation of Reinforced Concrete Beams**
Typical Section							
General Description	・Additional raking piles resist against the horizontal seismic forces. ・Raking piles and coping concrete are installed in front of the existing berth. ・The berth line is shifted seawards.	・Additional raking piles resist against the horizontal seismic forces. ・Existing deck concrete is removed partially. ・Coupled raking piles are installed between the existing piles. ・Removed area is to be reinforced and rehabilitated.	・Additional strut structure resist against the horizontal seismic forces. ・Submerged struts are installed onto the existing piles after removal of all deck concrete. ・Grouting mortar is injected between struts and piles to be integrated firmly. ・After setting struts, new deck concrete is reconstructed.	・Additional anchors with tie rods resist against the seaward horizontal seismic forces. ・Retaining wall resists the landward horizontal seismic forces through joint sealant. ・Land side deck concrete is removed partially and tie rods are installed to connect between deck and anchor wall. ・After installation of anchor, deck concrete is rehabilitated.	・Additional ground anchors resist against the seaward horizontal seismic forces. ・Retaining wall resists the landward horizontal seismic forces through joint sealant. ・Land side deck concrete is removed partially and ground anchors are installed. ・Deck concrete is rehabilitated after installation of ground anchors.	・Additional submerged beams reinforce pile structure to resist against the horizontal seismic forces. ・Submerged steel beams are installed to connect the existing piles each other. ・Grouting mortar is injected between steel beam and pile to be fixed firmly.	・Additional reinforced concrete beams reduce the stress of the existing piles and increase the resistances against the horizontal seismic forces. ・Concrete beams are constructed underneath the existing concrete beams.
Special Consideration for Rehabilitation	・Berth utilization is totally stopped due to construction of new concrete deck. ・Due to big equipment for construction, it is not recommendable for small size of berth (depth and length).	・Berth utilization is totally stopped due to demolition and reconstruction of the center of concrete deck. ・Due to big equipment for construction, it is not recommendable for small size of berth (depth and length).	・Berth utilization is totally stopped due to demolition and reconstruction of all concrete deck. ・Due to big equipment for construction, it is not recommendable for small size of berth (depth and length).	・Firm retaining wall structure is necessary behind the pier to resist horizontal seismic force. ・The space for construction area of anchor wall with tie rod is necessary. ・Berth utilization is partially possible due to the construction area behind the pier.	・Firm retaining wall structure is necessary behind the pier to resist horizontal seismic force. ・The space for construction area of ground anchor on the pier is necessary. ・Berth utilization is partially possible due to the small construction area on concrete deck.	・Berth utilization during construction is possible due to no construction work on land. ・Due to special equipment/tool such as floater, Special experience is necessary. ・It is applicable for large scale structure due to flexibility of large size of beam.	・Berth utilization during construction is possible due to no construction work on land. ・Due to minimal equipment for construction, no special experience is necessary. ・It is applicable for small scale structure only due to additional beam under the concrete deck.
Main Materials	・Steel pipe piles have more resilience than PC piles. ・Steel pipe piles can be driven with 20-25 degrees of slope.	・Steel pipe piles have more resilience than PC piles. ・Steel pipe piles can be driven with 20-25 degrees of slope.	・Submerged struts are fabricated in the suitable factory. ・Grouting mortar is necessary.	・Tie rods are available in the Philippine.	・Ground anchors are to be imported from foreign countries.	・Submerged steel beams are fabricated in the suitable factory. ・Grouting mortar is necessary.	・Rebars and concrete only
Quality Control	・No special skill is necessary.	・No special skill is necessary.	・Special experience for installation is required to construct submerged struts.	・No special skill is necessary.	・Special experience for installation is required to construct ground anchors.	・Special experience for installation is required to construct submerged beams.	・No special skill is necessary.
Workability	・Floating piling barge is required to be able to drive a raking pile. ・No special skilled works is needed.	・A special stage to be able to install raking pile is set on the deck. ・Normal construction methods are adopted except above stage. ・No offshore equipment is required.	・Demolition of all deck concrete is required. ・The dimensions of struts are to be adjusted by measuring the existing pile locations. ・Special engineering know-hows are required for installation of struts. ・Many kinds of works are to be carried out and construction period will be the longest.	・ Basically all works are onshore. ・ The deck side of tie wire should be fixed firmly with deck concrete to retain the horizontal forces. ・ Joint sealant is installed between deck concrete and coping of revetment.	・ Basically all works are onshore. ・ Drilling equipment is required to set the ground anchor into bearing layer. ・ The deck side of ground anchor should be fixed firmly with deck concrete to retain the horizontal forces. ・ Joint sealant is installed between deck concrete and coping of revetment.	・Special technical know-hows are required to install the submerged steel beams below the deck concrete. ・The length of each beam are determined by the location of the existing piles. ・Most of works are carried out under water. ・Special floater is necessary to install submerged beam.	・Large temporary stagings under water are required because most of works should be carried out below low tide level. ・Underwater concrete should be placed with securing the good quality of concrete. ・High-early-strength cement may use to utilize the berth after concrete placing.

Note : For all of type of above reinforcing structure, Environmental Performance Report and Management Plan (EPRMP) is required.

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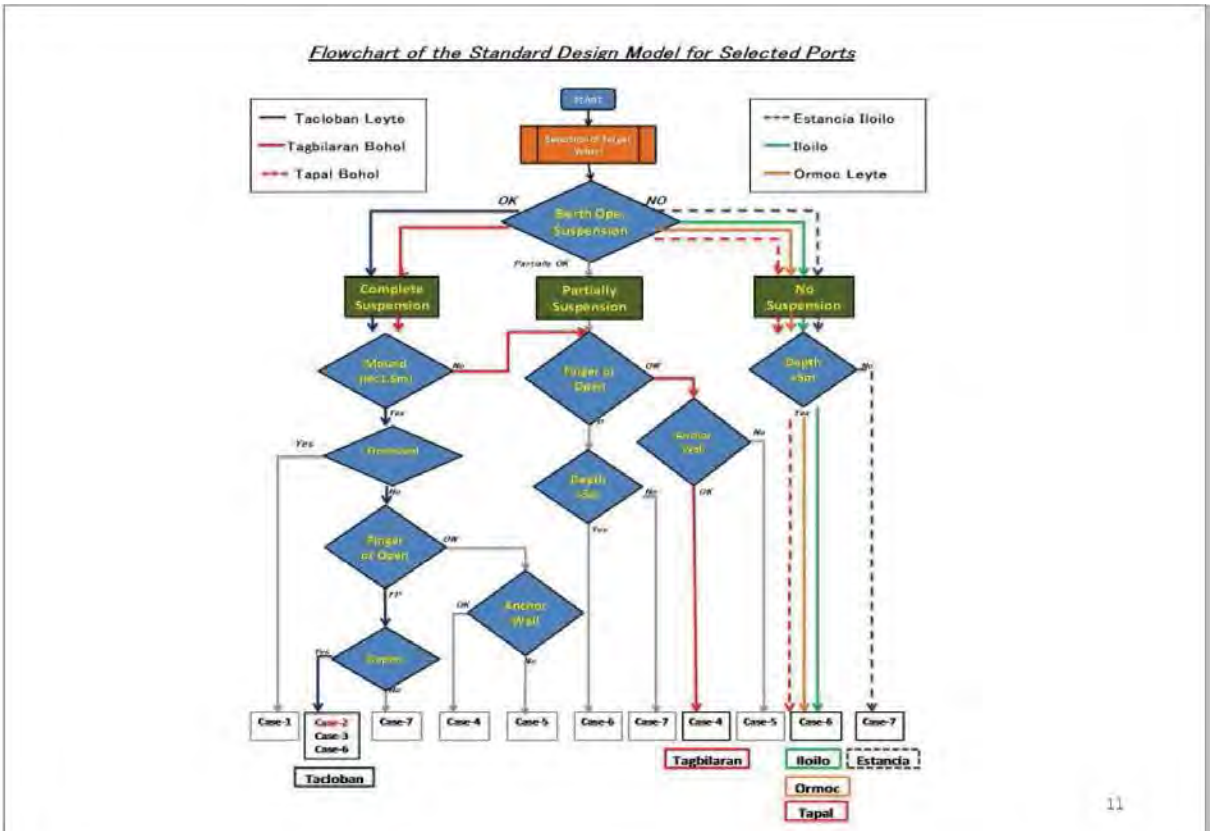


Expected Damage by Typhoon Wind

Design Criteria

- Current National Structural Code of the Philippines (NSCP) version 2010 divides the country into three zones.
- Design wind speed of Leyte, Bohol and Iloilo is 200kph=55.6m/sec
- Estimated wind speed of Yolanda is 240kph=66.7m/sec

Disaster for building structure

-For the Yolanda level of typhoon, common wooden and GI roofing building is not strong enough, all port buildings is recommended RC with CHB and heavy duty door and window.




Expected damage for Storm Surge and Tsunami

Design height of Storm Surge and Tsunami based on OCD report are as below;

	Tacloban	Olmoc	Tagbilaran	Tapal	Iloilo	Estancia
Storm Surge (m)	4.00	2.97	2.69	2.23	3.49	3.86
Tsunami (m)	4.00	3.00	6.80	6.14		

Overflow of storm surge on the wharf

Damaged transit shed by storm surge

Tsunami overflow the seawall in North Japan

Damaged precast slab by Tsunami in Japan

Based on the Japanese Tsunami, there was damage of precast slab between open-type wharf and retaining wall by 10m height tsunami in several ports as shown the photo.

Proposed Disaster Resilient Facilities for Storm Surge and Tsunami

Berthing facilities

Precast slab provision for the pier for 6m height of Tsunami

Buildings

ADM

- Office :2nd floor
- Office equipment: 2nd floor
- Doc, file:2nd floor

Transit shed and Warehouse

- All existing transit shed and warehouse are RC structure and GI roofing.

Passenger Terminal Building

- All existing PTB are RC structure and concrete roof deck or GI roofing.

- Further study for 6 m high tsunami for the buildings of Tagbilaran. Tapal no building.

Utilities

Utilities

- Power supply
- Water supply
- Communication

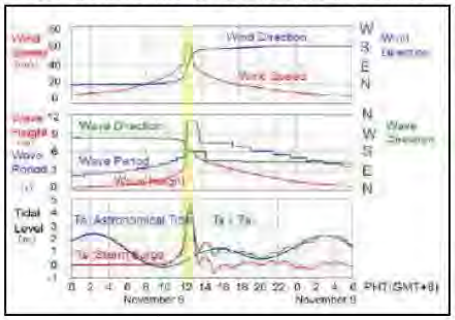
- Above utilities will be provided after disaster.

Others

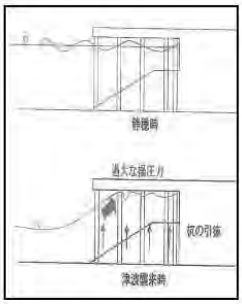
Expected damage by Wave of Typhoon

As experienced during typhoon Yolanda, there is no damage for the berthing facility except Estancia because all selected ports are sheltered from the high wave or located closed sea.

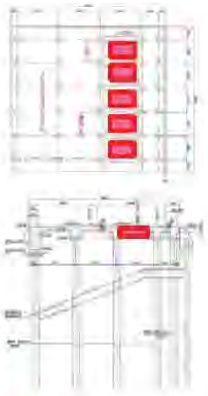
Condition of the wave action at Estancia



Condition of tide and wave height



Uplift pressure due to high wave



: Precast slab

In order to prevent the damage of the pier and piles by uplift, precast slab shall be provided to reduce the uplift pressure.

Preparation of Standard design Model for the berthing facilities, buildings, utilities and others for disaster resilient.

Standard Design Model of berthing facilities for Disaster Resilient Ports are as follows.

Name of Port	Leyte Area		Bohol Area		Iloilo Area	
	Tacloban	Ormoc	Tagbilaran	Tapal	Iloilo	Estancia
Case No.	Case 2	Case 6	Case 4	Case 6	Case 6	Case 7

Basis of the Cost Estimate for standard Design Model

1. Cost estimate includes standard design model for berthing facilities, buildings, utilities and additional facilities for disaster resilient except followings;

1) Repair for damage on the existing facilities
2) Rehabilitation of deteriorated structure
3) Improvement for the existing facilities

END OF PRESENTATION

THANK YOU FOR YOUR ATTENTION