

# Building Disaster and Climate Resilient Cities in ASEAN (CN18)

1<sup>st</sup> Workshop for Urban Resilience in  
ASEAN

Orientation for Group work  
(Disaster Risk Reduction Measures, and  
Example of Disaster Management Plan and  
Evacuation/Relief Plan)

December 8, 2016

JICA Project Team

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## Table of Contents

1. Disaster Risk Reduction Measures
2. Example of Disaster Management Plan and Evacuation/Relief Plan
  - 2.1 Map of Evacuation Area with Facilities Inventory
  - 2.2 Plan of Evacuation/Relief Road

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## Agenda 1: Disaster Risk Reduction Measures (3 Measures before the Disaster by Prevention & Mitigation/ Preparedness)



Source: JICA Project Team

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## Measures for Reducing Hazard Magnitude

### For Example for Flood Inundation

- River Improvement Works
- Drainage Systems and Facilities
- Other Infrastructures

Source: JICA Project Team

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## Measures for Reducing Hazard Magnitude



Source: JICA Project Team

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## Measures for Reducing Hazard Magnitude

- Infrastructure to reduce frequency and magnitude of hazard
- Require considerable investment and time
- Withstand flooding up to a certain design (safety) level, e.g., 10 yr, 20 yr or 50 yr flood
- If design level is exceeded, it cannot prevent the occurrence of damage

*There is limitation in measures for reducing hazard magnitude. Other measures such as reducing exposure and reducing vulnerability also should be taken.*

Source: JICA Project Team

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## Measures for Reducing Exposure

- ④ Resettlement
- ④ Land use Zoning and Regulations (for industrial area, residential area)

Source: JICA Project Team

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## Measures for Reducing Vulnerability

- ④ Hazard/Vulnerability Maps
- ④ Evacuation/Relief Plan
- ④ Watershed Management
- ④ Information, Education and Communication (IEC) Program
- ④ Monitoring, Forecasting and Warning System
- ④ Operation & Maintenance of Structure

Source: JICA Project Team

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## Agenda 2: Example of Disaster Management Plan and Evacuation/Relief Plan

### 2.1 Map of Evacuation Area with Facilities Inventory

Source: JICA Project Team

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9

							Paved	Water	Non-Waterways	Kitchen				
Name of Surveyed Facility	Evaluation Center/Facility	Location	Type of Structure	Size of Area (m <sup>2</sup> )	Capacity (no. festival persons)	Estimates (no. festival persons)	CERILLCO Component	Water meter/utility at the Event Trucks	BIC	# of "Shower" #	Lavatory Counting Area	Faucet		
1	CDO City													
1.1	Alexis Elementary School & Covered Upper Building Court		"Covered court (concrete, standard) (towers, concrete, steel) +Tanks (during Summer)"	1,740	112 / 540	Sending: 40 No Public: 40 facilities	Yes	No	Water District	9	1	6	9 / 0	
1	Bouling													
1.2	Xavier Heights Covered Court	Upper Building	"Standard (concrete)"	680	22 / 140	Sending: No Public: 20	Yes	No	Water District	2	2	2	1 / 0	
1.3	Martinez Farm	Upper Building	"Grounds(orchid)"	No data	No data	Sending: 121 facilities	Yes	No	Nature	2	2	2	1	Nature
1.4	Villa Verde	Lower Building	"Grounds(orchid)"	No data	No data	No Public: 40	Yes	No	Water District	Yes	No	No	1	Nature
2.1	Boston Elementary School & Grounded Court	Zone 5, Boston	"Grounded (concrete)and 2nd floor (concrete) +23 shower rooms (standard)"	1,929	124 / 450	No data	Yes	No	Water District	Yes	1 shower	1 shower	1 shower	5 / 0
2	Boston													
2.2	Hillg Hall	Zone 4, Boston	"2 library (concrete)"	35	2 / 12	Sending: 100 facilities Public: None	Yes	No	Water District	Yes	5	5	5	1 / 0

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[illegible]

11

## Agenda 2: Disaster Management Plan and Evacuation/ Relief Road Plan

### 2.2 Plan for Evacuation/Relief Road (New Road Planning, Route Planning for Evacuation /Relief with Sign Board)

Source: JICA Project Team

12

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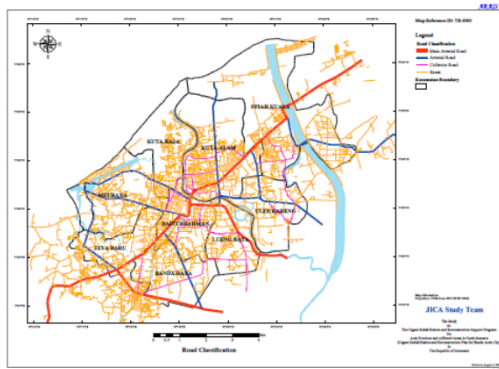
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### Example: Road Classification Map, Project in Indonesia



Source: Aceh Tsunami Project JICA/NK, 2005

13

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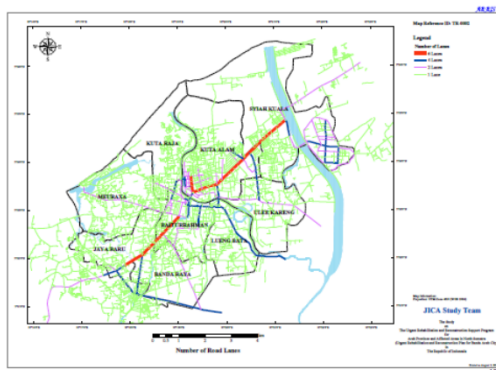
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### Example: Number of Road Lane, Project in Indonesia



Source: Aceh Tsunami Project JICA/NK, 2005

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[illegible]

Source: Aceh Tsunami Project JICA/NK, 2005

[illegible]

The map displays the Banda Aceh Road Network Framework Plan. It includes a legend with the following categories:

- Step Distance (500 M):**
  - External Road (Red line)
  - Internal Road (Blue line)
  - Sub-Internal Road (Purple line)
  - Sub-Sub-Internal Road (Light Blue line)
  - Feeder Road (Orange line)
  - Access Road (Pink line)
  - Service Road (Yellow line)
  - Emergency Road (Green line)
- Boundary:**
  - Administrative Boundary (Black outline)

The map also features a north arrow, a scale bar (0 to 1000 M), and a title block with the following information:

**Banda Aceh Road Network Framework Plan**

**ICCA Study Team**

**Prepared by:** [Name]

**Checked by:** [Name]

**Approved by:** [Name]

**Date:** [Date]

**Scale:** [Scale]

**Sheet:** [Sheet]

**Project:** [Project]

**Client:** [Client]

**Location:** [Location]

**Version:** [Version]

Source: Aceh Tsunami Project JICA/NK, 2005

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Source: Aceh Tsunami Project JICA/NK, 2005

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**LEW**



18

18

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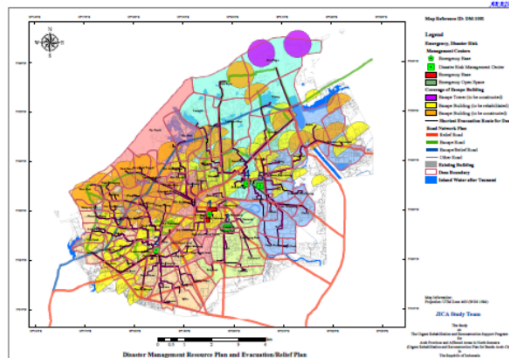
1889



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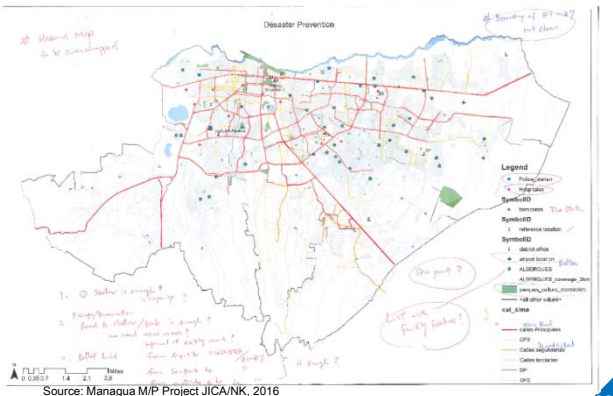
### Example: Disaster Management Plan and Evacuation/Relief Plan, Project in Indonesia



Source: Aceh Tsunami Project JICA/NK, 2005

21

### Disaster Management Plan and Evacuation/Relief Plan in Managua



Source: Managua M/P Project JICA/NK, 2016

22

### Disaster Mitigation and Risk Management in Nicaragua (Example)

#### (1) Basic Approach in Disaster Risk Reduction and Management

##### Well-Balanced Structural and Non-Structural Measures

#### (2) Possible Structural Measures ???

Disaster	Possible Structural Measures	Remarks
Seismic	- Reinforcement of Buildings/Structures	
Flood	- River Channel Improvement (e.g., Increase of Flow Capacity of Existing Channel by Change in Section, Concreting, Dredging including Cleaning of Solid Waste, Extension of New Channel, etc.) - Development of Retarding Basin (e.g., Dredging of Existing Facilities, Construction of Additional Micropresses, etc.)	
Landslide	- Soil Erosion Control (e.g. Bonas Program) - Afforestation/ Reforestation	

#### (3) Possible Non-Structural Measures ???

- 1) Establishment of Permanent Office/Staff for Disaster Management and Program
- 2) Update of Hazard Map and Dissemination to Citizen for Understanding
- 3) Land Use Regulation in Cause, Micropresses and High Risk Area
- 4) Improvement of Public Emergency Facilities for Disaster Preparedness
- 5) Development of Emergency Transportation Network
- 6) Upgrade of Disaster Forecasting and Warning System
- 7) Consideration on Environment including Solid Waste Management

Source: Managua M/P Project JICA/NK, 2016

Source: JICA Project Team

23



Results of 2 <sup>nd</sup> Preliminary Risk Assessment and Selection of Cities				
Country	Short Listed Cities		Candidate City	
	Name	Number of Cities	Name	Number of Cities
Cambodia	Battambang (F)	1	Battambang (F)	1
Indonesia	Bima (E), Semarang (F), Denpasar (T)	3	Denpasar (T)	1
Lao PDR	Luang Prabang (F)	1	Luang Prabang (F)	1
Malaysia	Kuala Terengganu (F)	2	Kuala Terengganu (F)	1
Myanmar	George Town (T) Amarapura (E), (F) Kyiimyindaing (T), (C) to be internally discussed	2	Kyimyindaing (T), (C) to be internally discussed	1
Philippines	Butuan (F)	2	Butuan (F)	1
Thailand	Meycauayan (E) Pathumthani (F) Rayong (F)	2	Pathumthani (F)	1
Viet Nam	Qui Nhon(T), Hue(F), Ha Long (T)	3	Qui Nhon(T), (C) to be internally discussed	1
	Total	16	Total	8

( ) shows the main disaster type for the cities. (C): Cyclone, (E): Earthquake, (F): Flood, (T): Tsunami

Source: JICA Project Team

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Thank you very much!

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