Appendix-8: Presentation materials of JICA Study Team (Tacloban City)

JICA Study Team

Building-Safer-City Approach by JICA

Workshop I on January 8th , 2016

Table of Contents

- ✓ CLUP Revision Process
- ✓ Building Safer City Approach
- ✓ Step 4: Hazard Analysis
- ✓ Step 6: Spatial Strategy
- ✓ Disaster Risk Reduction Management Options
- ✓ Step 7: Land use plan

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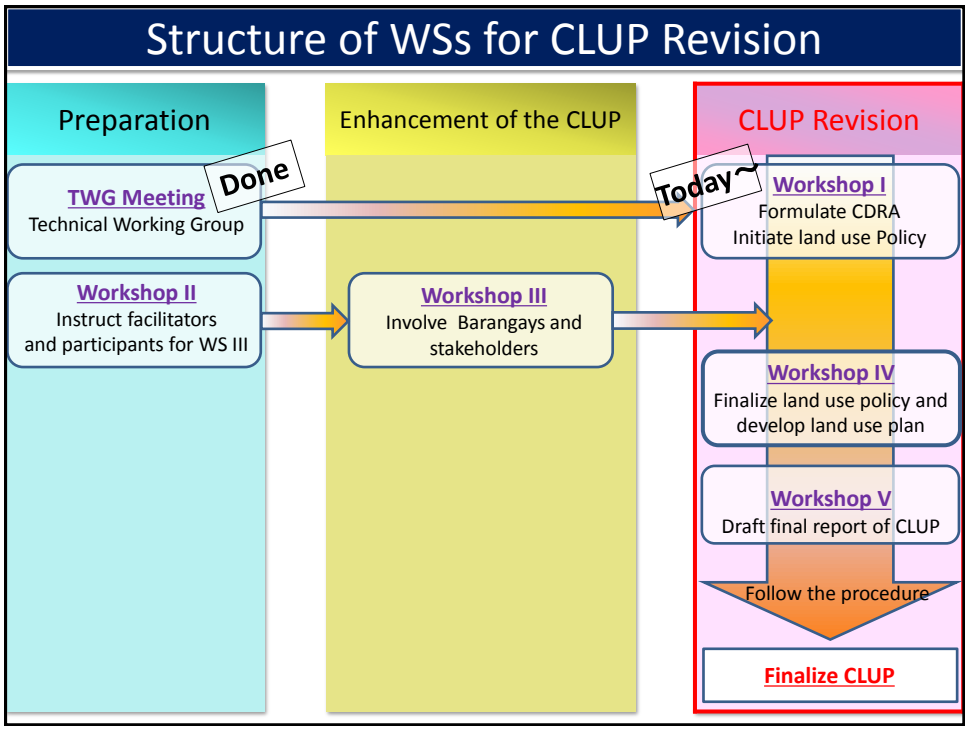
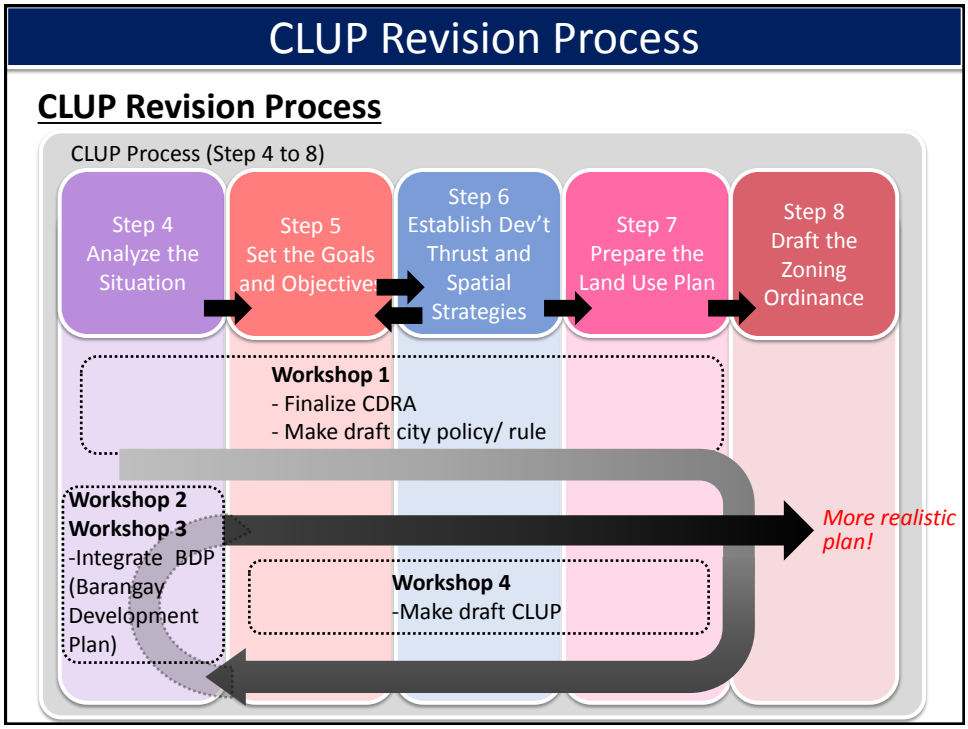

Structure of WSs for CLUP Revision
Preparation
Enhancement of the CLUP
CLUP Revision
TWG Meeting
Technical Working Group
Done
Today~
Workshop I
Formulate CDRA
Initiate land use Policy
Workshop II
Instruct facilitators and participants for WS III
Workshop III
Involve Barangays and stakeholders
Workshop IV
Finalize land use policy and develop land use plan
Workshop V
Draft final report of CLUP
Follow the procedure
Finalize CLUP


CLUP Revision Process
CLUP Revision Process
CLUP Process (Step 4 to 8)
Step 4 Analyze the Situation
Step 5 Set the Goals and Objectives
Step 6 Establish Dev't Thrust and Spatial Strategies
Step 7 Prepare the Land Use Plan
Step 8 Draft the Zoning Ordinance
Workshop 1
- Finalize CDRA
- Make draft city policy/ rule
Workshop 2
Workshop 3
-Integrate BDP (Barangay Development Plan)
Workshop 4
-Make draft CLUP
More realistic plan!

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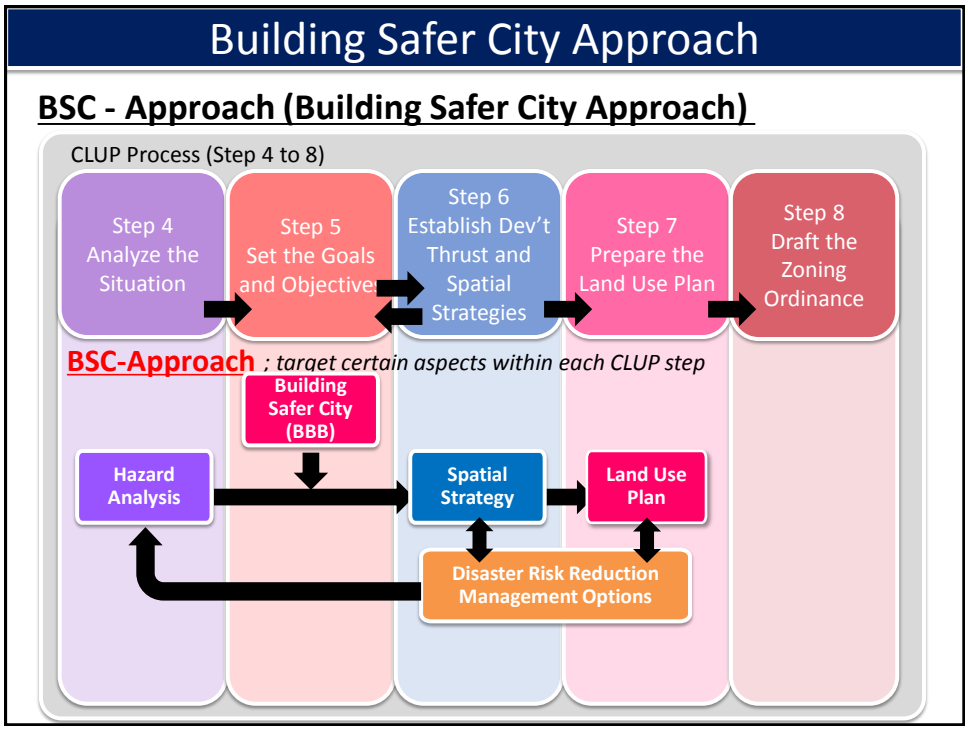
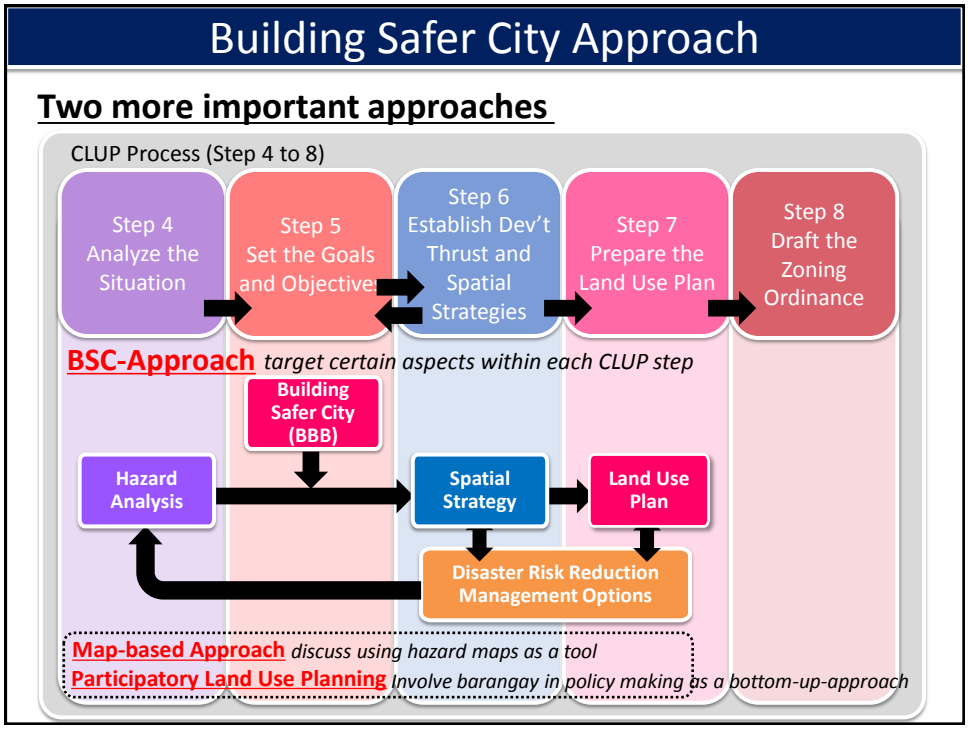

Building Safer City Approach
BSC - Approach (Building Safer City Approach)
CLUP Process (Step 4 to 8)
Step 4 Analyze the Situation
Step 5 Set the Goals and Objectives
Step 6 Establish Dev't Thrust and Spatial Strategies
Step 7 Prepare the Land Use Plan
Step 8 Draft the Zoning Ordinance
BSC-Approach ; target certain aspects within each CLUP step
Building Safer City (BBB)
Hazard Analysis
Spatial Strategy
Land Use Plan
Disaster Risk Reduction Management Options


Building Safer City Approach
Two more important approaches
CLUP Process (Step 4 to 8)
Step 4 Analyze the Situation
Step 5 Set the Goals and Objectives
Step 6 Establish Dev't Thrust and Spatial Strategies
Step 7 Prepare the Land Use Plan
Step 8 Draft the Zoning Ordinance
BSC-Approach target certain aspects within each CLUP step
Building Safer City (BBB)
Hazard Analysis
Spatial Strategy
Land Use Plan
Disaster Risk Reduction Management Options
Map-based Approach discuss using hazard maps as a tool
Participatory Land Use Planning Involve barangay in policy making as a bottom-up-approach

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Step 4

Hazard Analysis

In the process of CDRA using Hazard Maps

How to make Hazard map

Based on scientific method

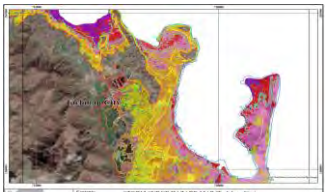
Storm surge Hazard map

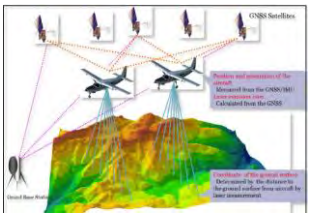
STEP 0: Base map preparation by LIDAR survey

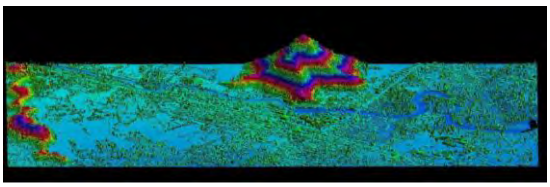
STEP-1: Survey of storm surge marks

STEP-2: Mathematical Analysis

STEP-3: Making the hazard map using the worst case scenario







STEP-1: Survey of storm surge marks

・The inundation height (height from the sea surface) and the inundation depth (height from the ground) was measured based on eyewitness account after interviewing residents.

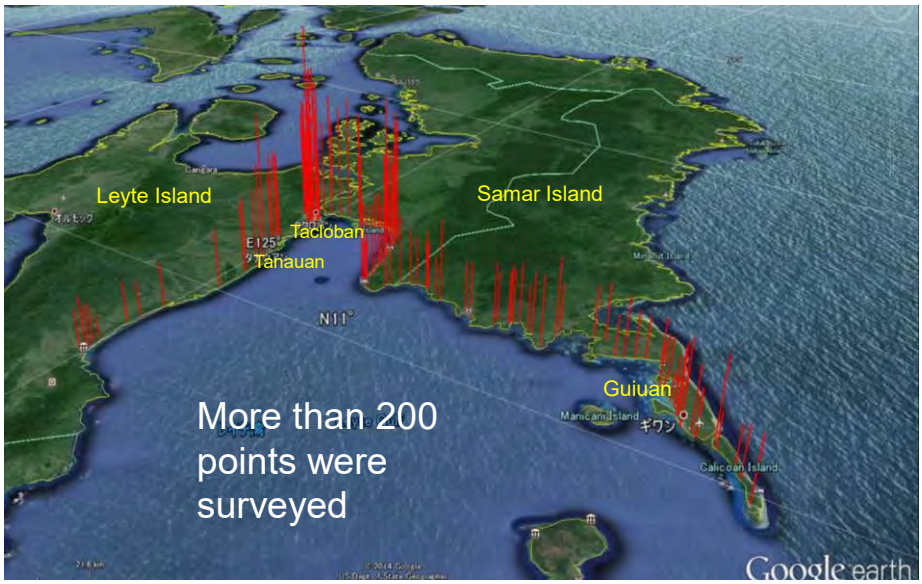
①Residential zone

②Seaside road

③Seashore

How to make Hazard Map：Survey of storm surge marks

Storm surge height along coastal area checked by storm surge marks



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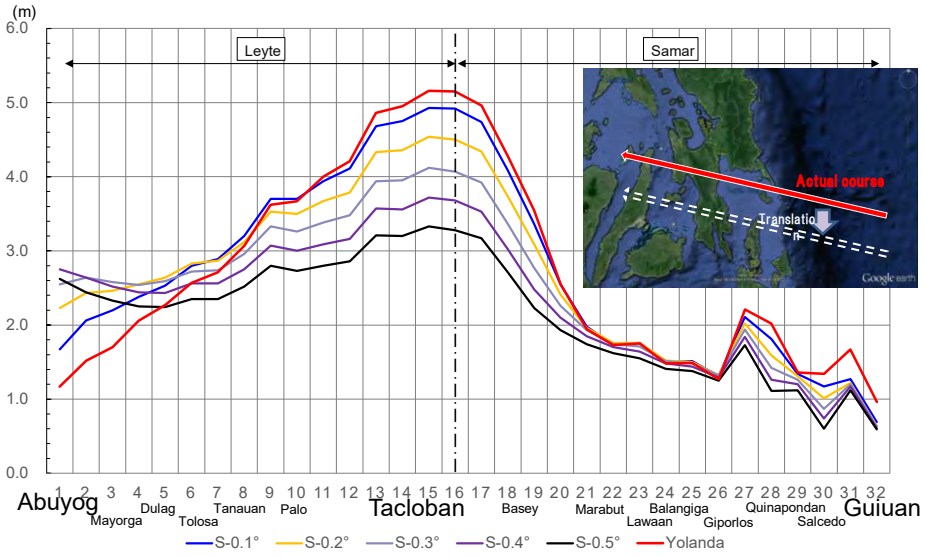
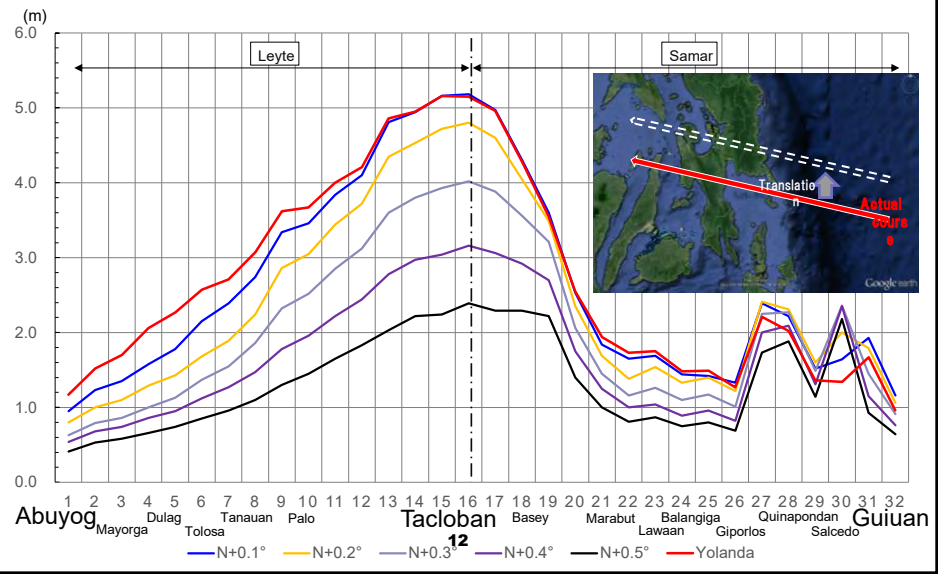
STEP-2: Mathematical Analysis

Distribution of the maximum deviation in the case of moving Yolanda Course to the South



STEP-2: Mathematical Analysis

Distribution of the maximum deviation in the case of moving Yolanda Course to the North



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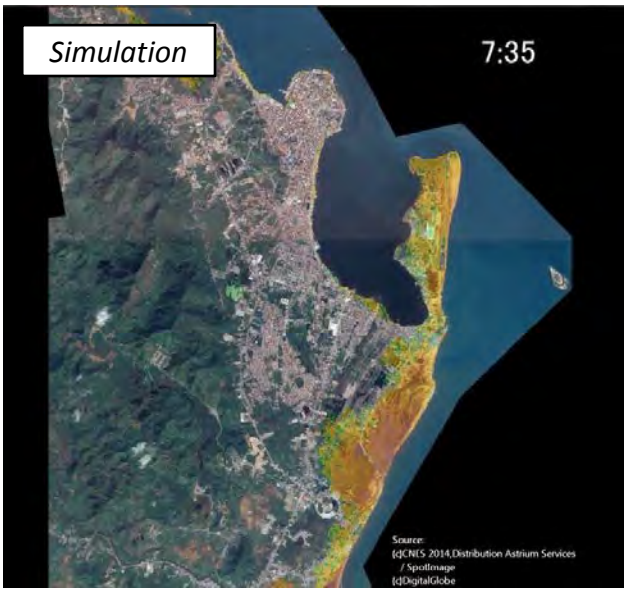
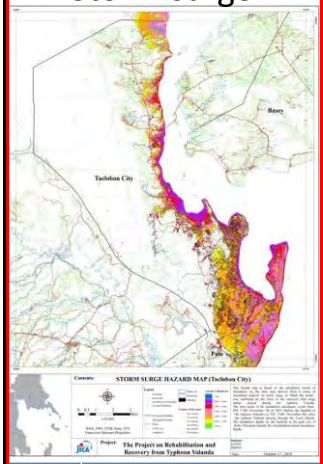
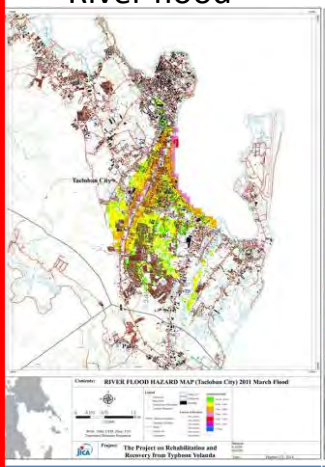
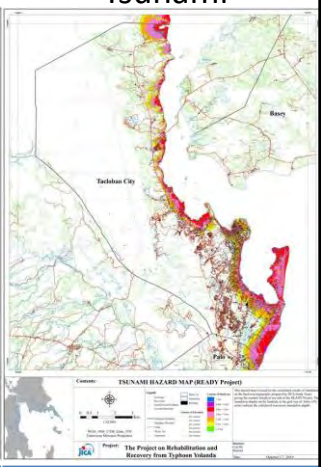
STEP-3: Making the hazard map using the worst case scenario



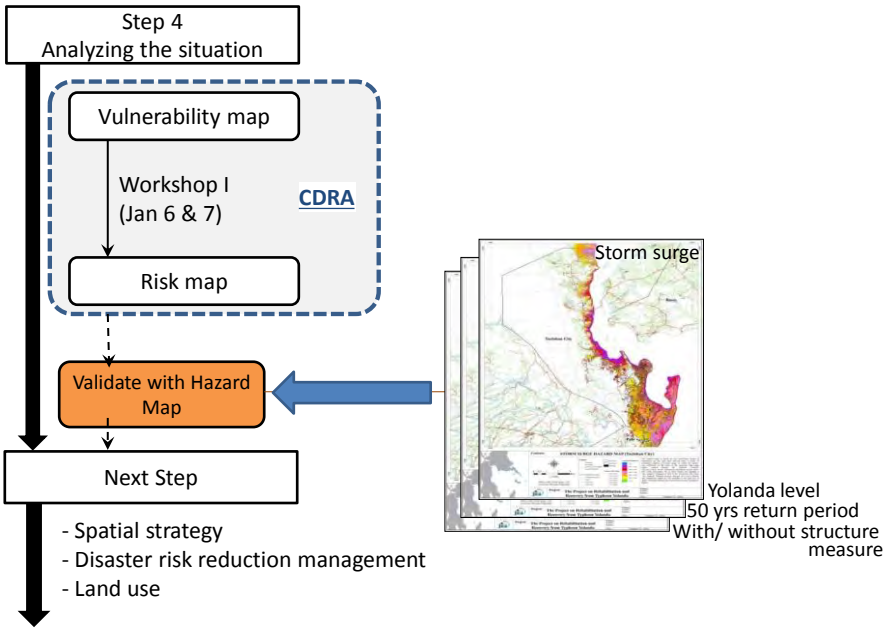
- Land use plan
- Location of Public Facilities
- Evacuation Centers
- Emergency logistic routes

Hazard maps

Hazard maps (Storm surge, Flood and Tsunami)

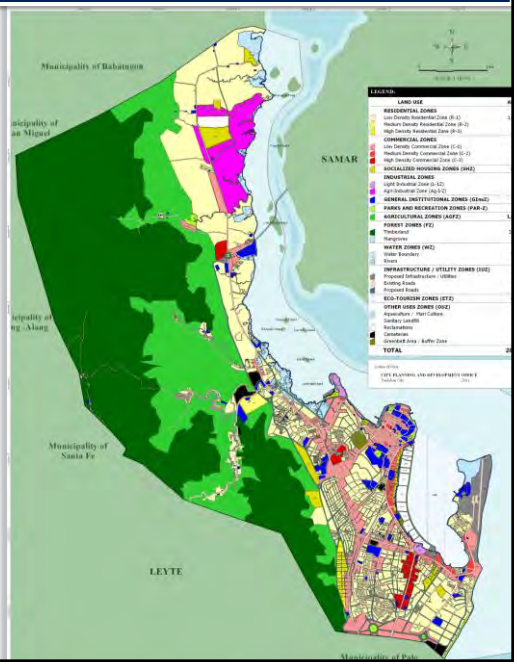
Storm surge	River flood	Tsunami
		
Basis: Worst Case Scenario (Typhoon Yolanda)	**March 2011 Flood**	**Ready Project**

Validate with Hazard Map



Land use planning

Validate the existing land use plan proposal with STORM SURGE hazard map



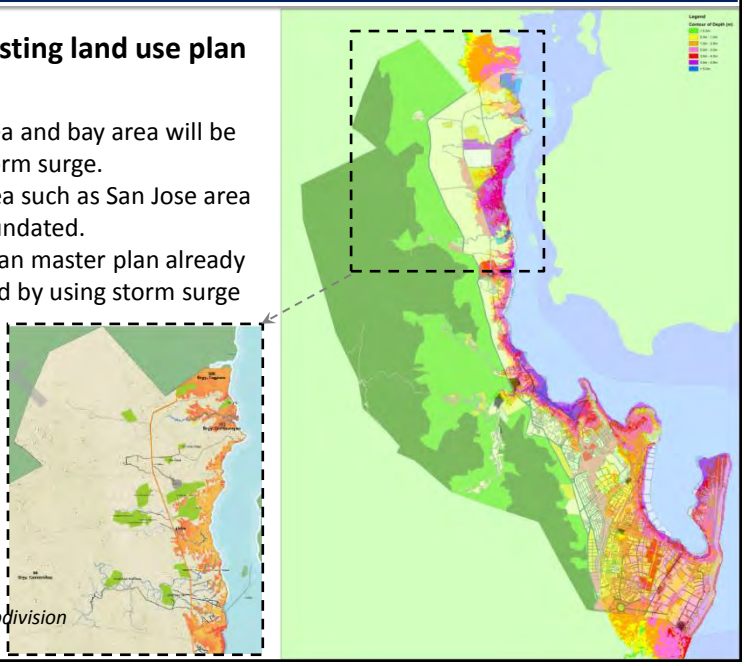
Land use planning with storm surge hazard map

Validate the existing land use plan

The results are:

- Downtown area and bay area will be affected by storm surge.
- Residential area such as San Jose area also will be inundated.

* The North Tacloban master plan already applied this method by using storm surge hazard map.



Location of the NHA subdivision (in green/safe)

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Step 6

Spatial Strategy

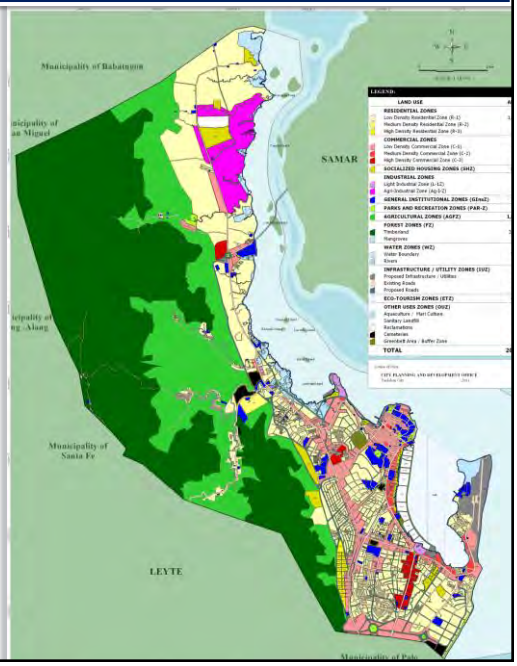
Purpose and methodology for Spatial Strategy

The purpose of spatial strategy discussion is
to identify developable land.

1. Identify the areas that should be protected from disaster
2. Designate high risk areas as No-Dowelling Zone

1. Identify the areas should be protected from disaster

- CLUP before Yolanda
- JICA Workshop last September 2014
  → Other powerpoint



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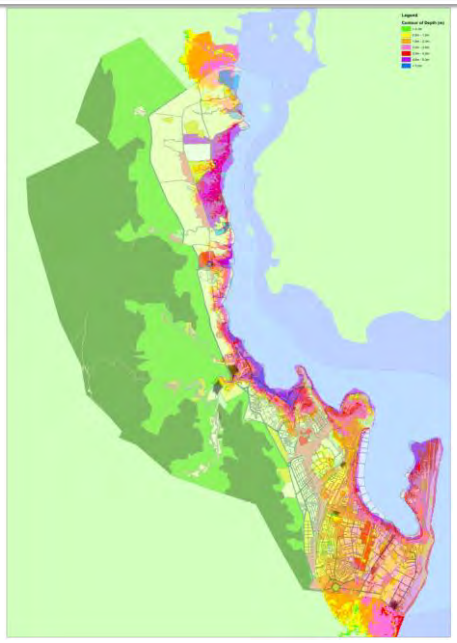
Basic View for Future Land Use in Tacloban

1. The growth direction of Urban area is Southward.
2. Since the South boundary of the City is Palo, where the residential area is dominant, Tacloban's growth will encounter a limitation.
3. In terms of the Balanced Development and Disaster Prevention for Tacloban, the development in North Area has been prioritized.
4. The sustainable development of the existing downtown is also required.
5. Reallocation of the urban function in Coastal Zone such as Cancabato Bay should be considered. Some function of the coastal zone should be transferred to the inland area.

1. Identify the areas should be protected from disaster

Which areas should be protected from disaster?



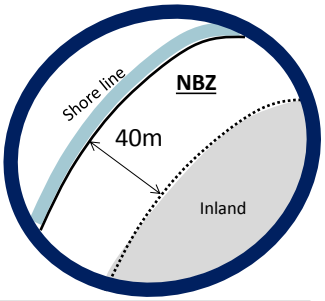
2. Designate high risk areas as No-Build Zone or No-Dowelling Zone

☐Current status :

No building zone (NBZ)

The easement areas defined by the Water Code, Civil Code and Revised Forestry Code of the Philippines

(Joint Memorandum Circular no. 2014-01)



No Dwelling zone (NDZ)

- Tacloban City Ordinance

40m from shore line

2. Designate high risk areas as No-Dowelling Zone

☐How to categorize No-Dowelling Zone?

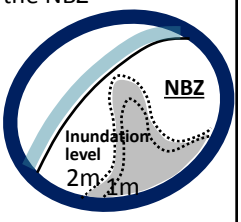
Proposed NDZ based on Japanese example:

- **More than 2 meters** of inundation depth is the criteria for the NBZ

Table. Inundation Depth and Implications (Tsunami)*

Inundation Depth (meter)	Implications
10 m and over	3-story building is completely submerged
5 m to 10 m	2-story building is submerged
2 m to 5 m	Most wooden houses are completely damaged
1 m to 2 m	If no protection, most people die
0.3 m to 1 m	People cannot move. Evacuation becomes impossible.

*Source: Ministry of Land, Infrastructure, and Transport, Japan. 2012. Manual for Setting Tsunami Inundation Assumption, Ver. 2.



After storm surge, there will be no house to go back

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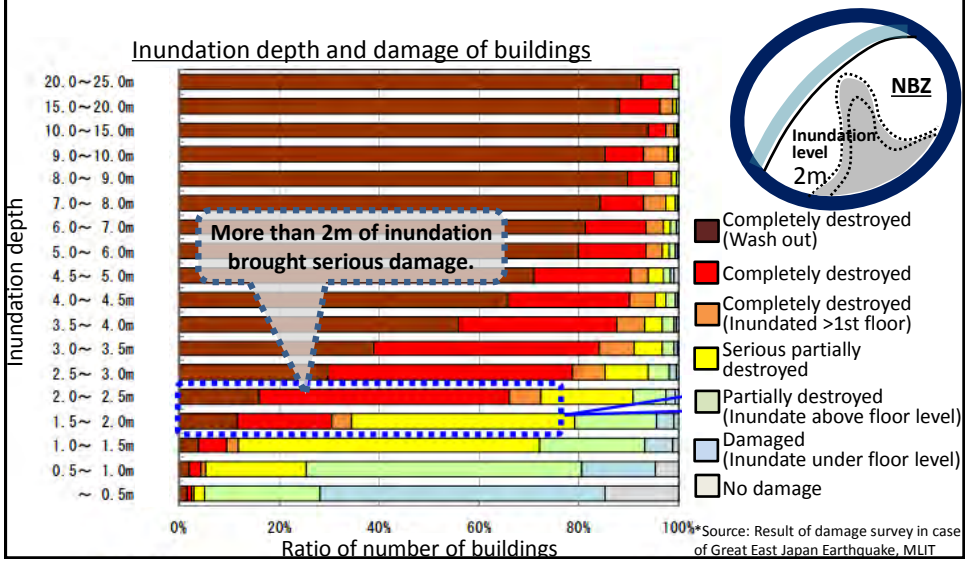
2. Designate high risk areas as No-Dowelling Zone

☐Reason why 2 m is proposed as a criteria?



2. Designate high risk areas as No-Dowelling Zone

☐ High risk area

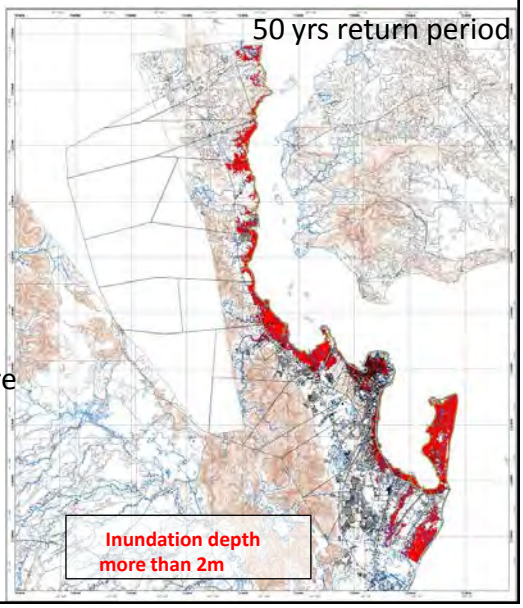
Inundated area:

- Downtown
- San Jose area
- Along Burayan river
- Airport area

⬇

Many areas are designated as high risk area.

➢ Disaster risk reduction measure should be considered.
- Structure measures
- Non-Structure measures



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Disaster Risk Reduction Management Options

Concept to Manage Hazard Risk

Concept

- It should be based on Scientific analysis ⇦ Already explained
- The best mix of structure measure and non-structure measure

How to manage hazard risk

1. **Risk avoidance or elimination**
   - **Relocation**/ easement/ protection
2. **Risk mitigation**
   - **Mitigation: Structural & non-structural measures**
   - **Preparedness: Evacuation /early warning system/ education/**
   - **Back-up systems/ alternative point facilities**
   - Separation (de-concentration)
3. **Risk sharing or risk transfer –insurance**
4. **Risk retention or acceptance – "do-nothing"**

Risk avoidance: Relocation

Relocation

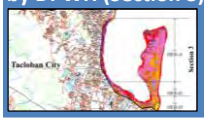
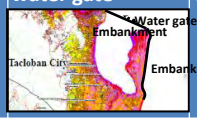
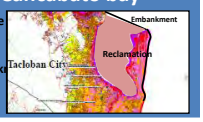
- Relocation to North Tacloban
  - Number of planned permanent shelters: 15,731
  - 1,513 were already constructed, but only 811 were occupied.
  - 969 of temporary shelters were already constructed, but only 471 were occupied.
- Issues

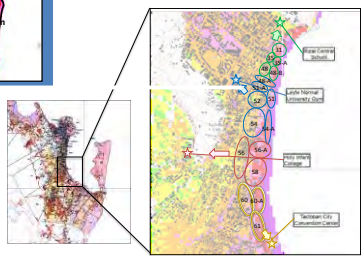
- Insufficient development of infrastructure such as water supply system
- Target number of the shelter should be constructed immediately.

Risk Mitigation: Structural/ Non-structural measures

Structural measures

- **Existing Proposals in Tacloban City**

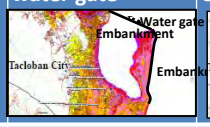
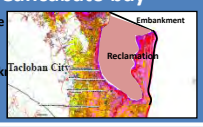
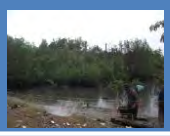
Option 1 Tidal Embankment by DPWH (Section 3)	Option 2 Embankment and water gate	Option 3 Reclamation of Cancabato bay
		



Non-structural measures

- **Evacuation:**
  - Formulation of evacuation plan
  - Preparation of timeline action plan
  - Conduct of evacuation drills
  - Establishment of CBDRRM system
- **Early warning system**
  - Development of the system
  - Preparation of the equipment
- **Education**

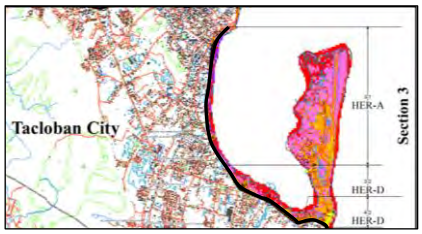
Structural measures: Comparison table

	Option 1 Tidal Embankment by DPWH (Section 3)	Option 2 Embankment and water gate	Option 3 Reclamation of Cancabato bay	Mangrove Only option
				
Cost: (mil. peso)	1,501	3,630	> 10,000	Not defined
Effect period:	Short to middle	Short to middle	Middle to long	Long
Technical/ planning issue:	Relocation	• Construction under water • Operation and management of water gate	• Enormous scale of Reclamation • Measure for land subsidence	Lowest effect for protection
Environment:	Lower impact	Water pollution	Biological system Loss of original landscape	Good
Development:	• 33.7 km², including downtown area will be protected.	• People can go to downtown directly from airport.	• Developable area will be expanded • Direct route from downtown to airport.	Good landscape for tourism

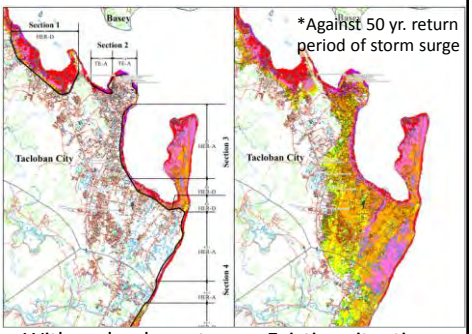
Option 1 of structure measures (1)

Option 1

Tidal Embankment Project by DPWH



- **Outline:** Construction of Tide embankment from Tacloban to Tanauan is proposed by DPWH
  - -Measurement against 50 yr. return period of storm surge
  - -Elevation: MSL +4.0m *At section 3
  - -Constructed within the NBZ (40m from the shore line)
- **Cost**: 1,501 (mil. peso) *Only section 3
- **Positive aspects:**
  - -Protect 33.7 km² of the area →
- **Negative aspects:**
  - -Airport area (peninsula) will be not protected
  - -Construction around downtown takes time and effort due to relocation



With embankment Existing situation

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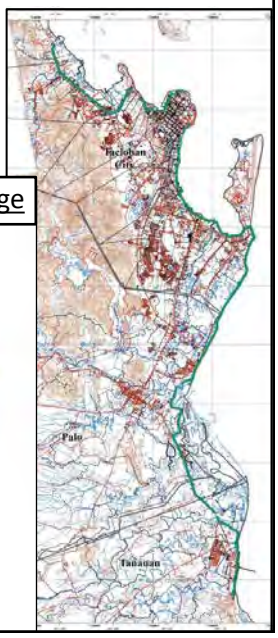
Option 1 of structure measures (2)

Option 1

Tidal Embankment by DPWH

✓ The area that will be protected by tide embankment IS NOT inundated by 50 years return period of storm surge.



Hazard map analysis of 50 yrs return period of storm surge

Without embankment

With embankment

JICA Study Team 2015.11.13

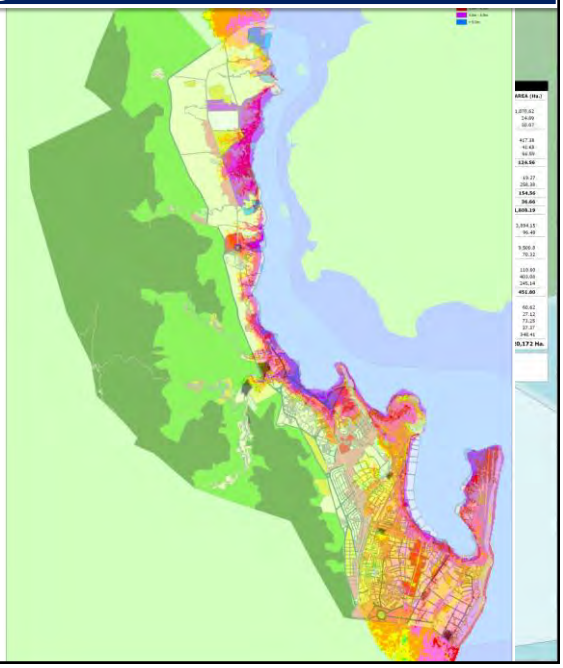
Step 7

Land use plan

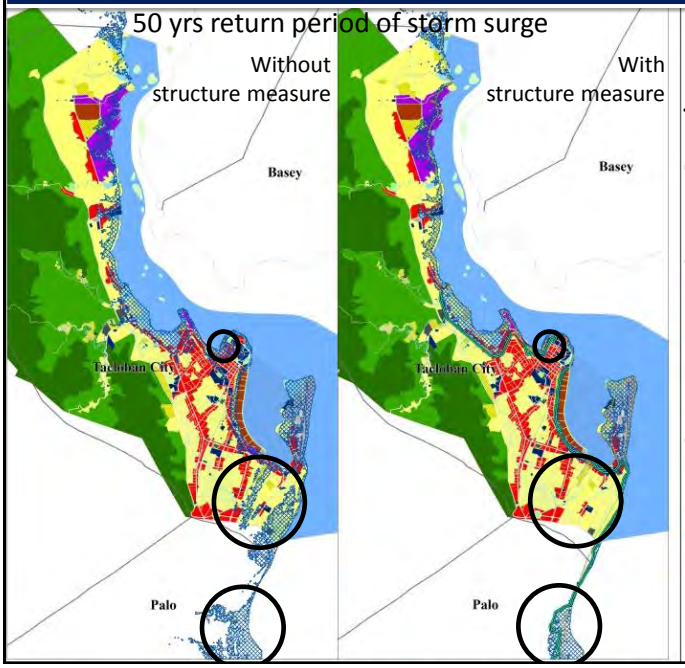
Reflecting storm surge hazard

Existing Land Use Plan

- What should we change?
- Which area to retain?



>2m inundation map by storm surge



The tidal embankment of DPWH is planned against 50 yrs. return period. Basically, existing land use plan is assured.

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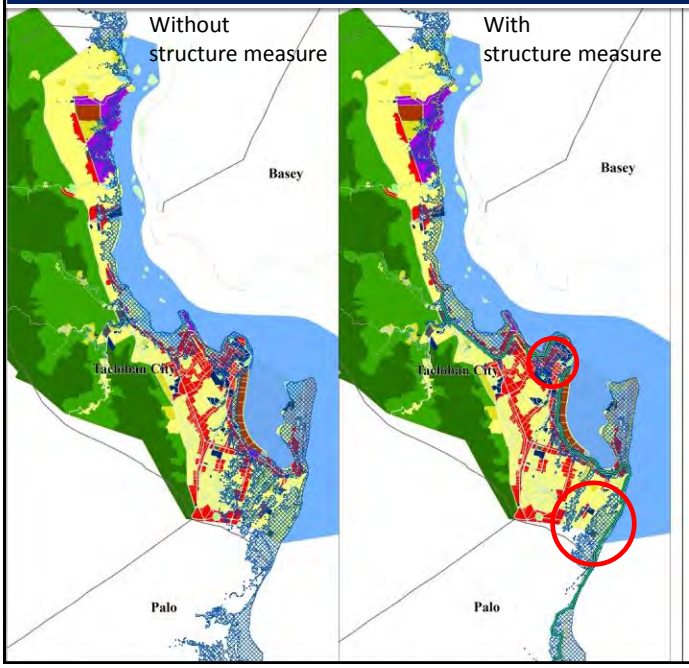
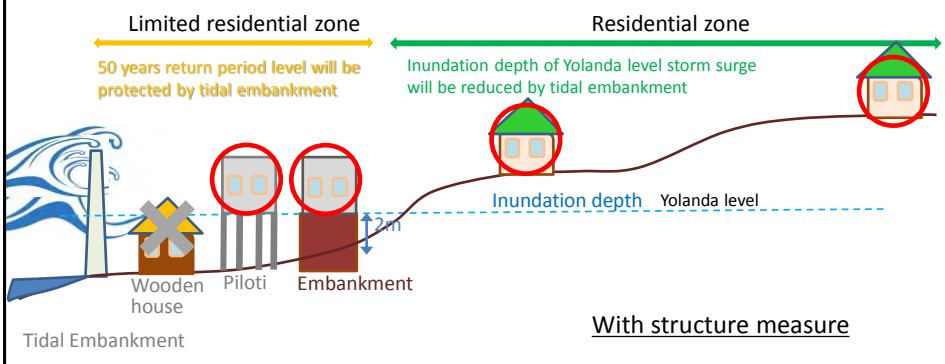
>2m inundation map by Yolanda level of storm surge



In case of Yolanda level, the inundation is expected to be HIGHER and some area will be affected by storm surge even with tide embankment

Vertical zoning with building type



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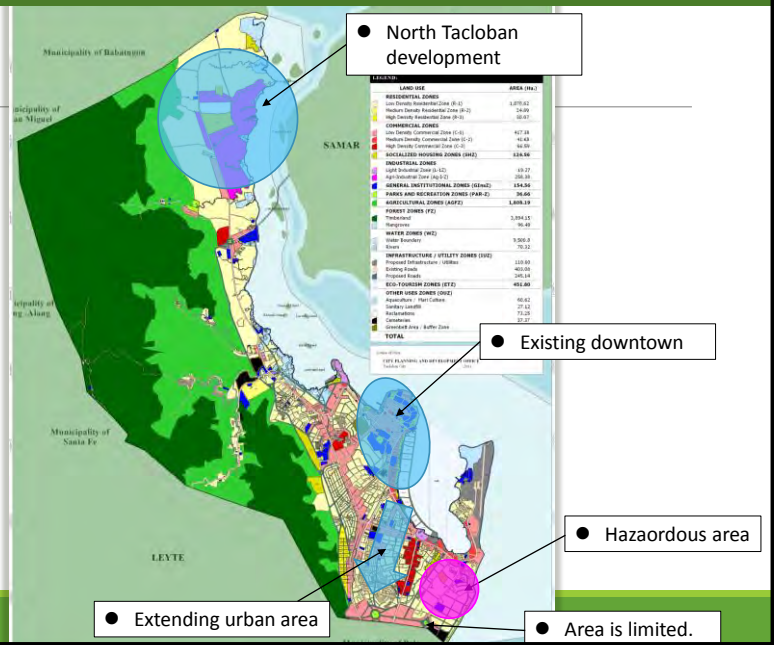
Spatial strategy

The result of JICA workshop
On Sep. 15, 2014

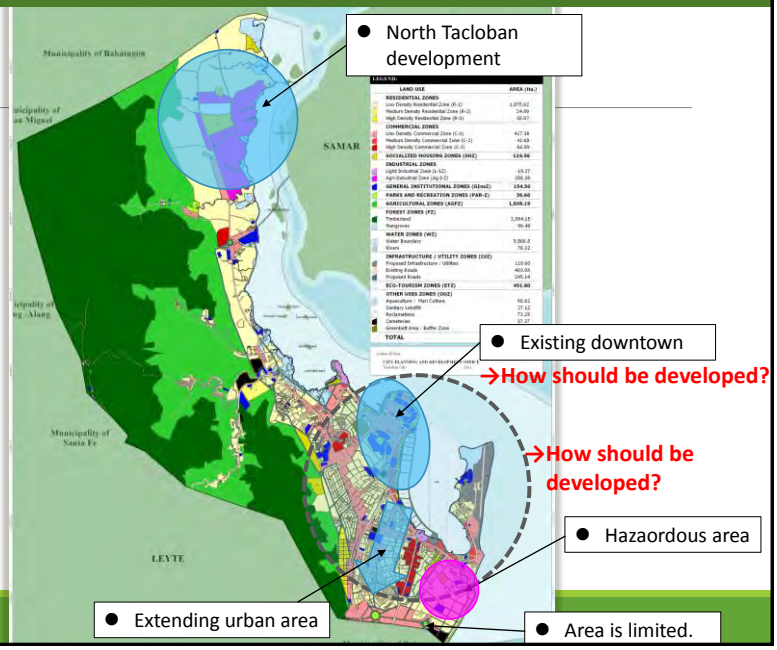
Table of Contents

- Current and future development
- Transportation network
-Result of discussion

Current and future development (1)



Current and future development (2)



Current and future development (3)

Basic View for Future Land Use in Tacloban

1. The growth direction of Urban area is Southward.
2. Since the South boundary of the City is Palo, where the residential area is dominant, Tacloban's growth will encounter a limitation.
3. In terms of the Balanced Development and Disaster Prevention for Tacloban, the development in North Area has been prioritized.
4. The sustainable development of the existing downtown is also required.
5. Reallocation of the urban function in Coastal Zone such as Cancabato Bay should be considered. Some function of the coastal zone should be transferred to the inland area.

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Tacloban Transportation network (1)

National road
across Tacloban city

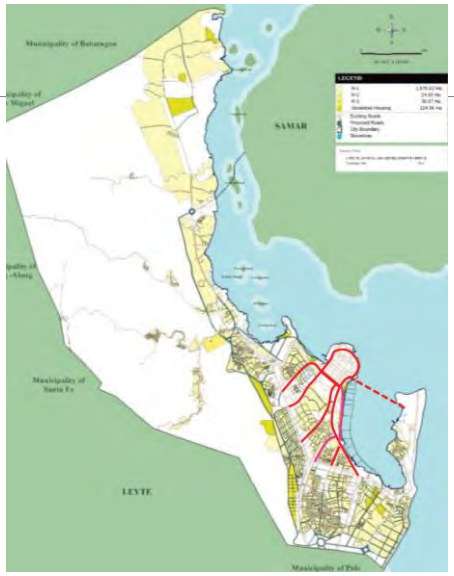
Tacloban Transportation network (2)

Bypass road

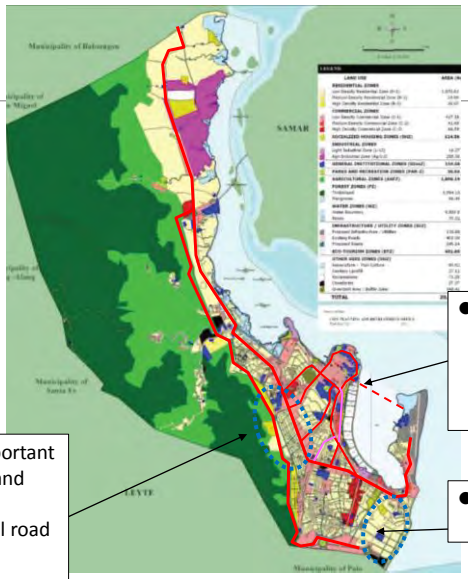
3

Tacloban Transportation network (3)

Trunk road in the downtown

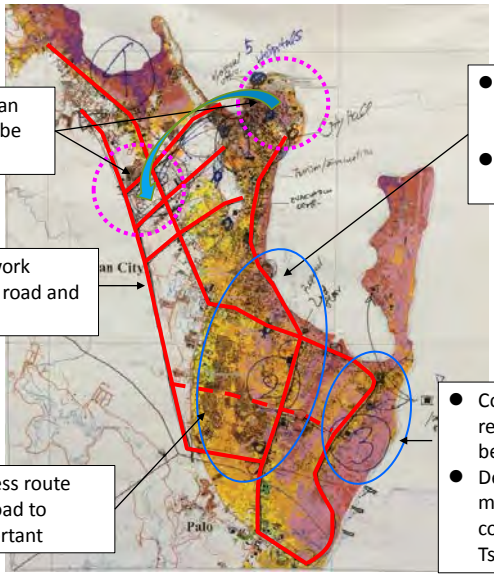


Review of discussion (1)



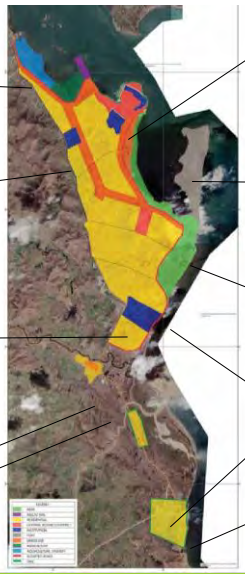
- Water environment should be considered in case of reclamation or closing bay
- Residential area, but hazardous area
- Connecting road is important between bypass road and trunk road.
- The area along national road should be developed effectively

Review of discussion (2)



- Transferring urban function should be considered.
- Strengthen network between bypass road and downtown area
- Review of access route from bypass road to airport is important
- Capacity of evacuation centers should be considered.
- Evacuation route should be reviewed.
- Conversion to non-residential area should be considered.
- Development of miniature hill should be considered instead of Tsunami tower.

Discussion result about land use



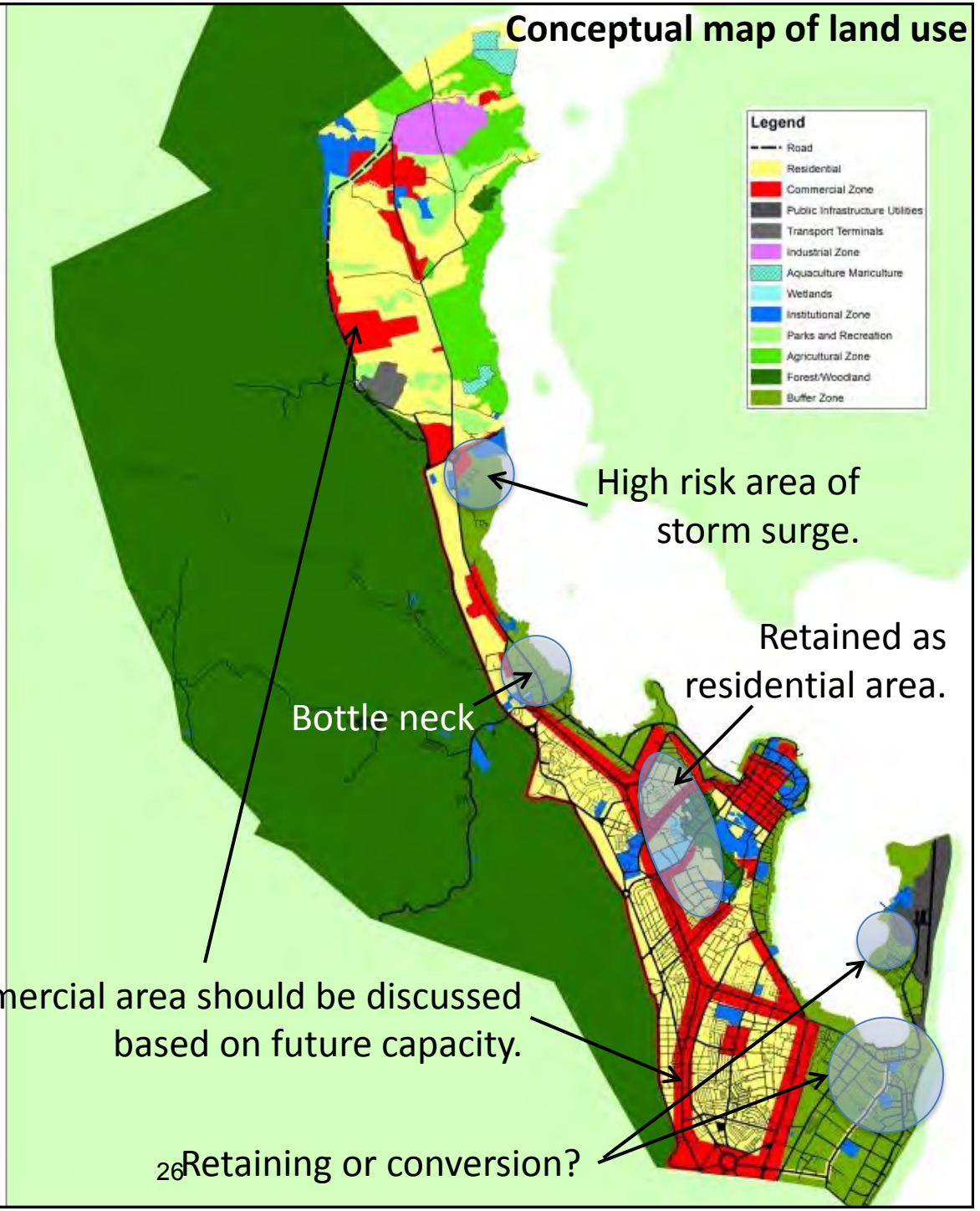
- •Land use change to aquaculture/ fisher zone
  •Relocation of residence
  •Development of evacuation towers/ evacuation routes
- •Development of core facilities as evacuation centers with buck-up function of government
  • Building improvement
- •Protection of government complex
  •Building improvement
  •Development of evacuation centers/ evacuation routes
- Development of municipal hall & core facilities as evacuation centers
  •Building improvement
  •Development of evacuation centers/ evacuation routes
- •Downtown Area
  •Development of evacuation centers/ evacuation routes
  •Building improvement
- •Land use change to airport zone
  •Relocation of residence
  •Improvement of airport terminal as evacuation center
  •Development of evacuation towers/ evacuation routes
- •Land use change to park and coastal forest
  •Relocation of residence
  •Development of evacuation towers/ evacuation routes
- Embankment & Elevated Roads
- Ring Dike-"Pearl Island"
- •Relocation of residence
  •Building improvement
  •Development of evacuation centers/ towers/ evacuation routes

Development Trust and Spatial Strategy

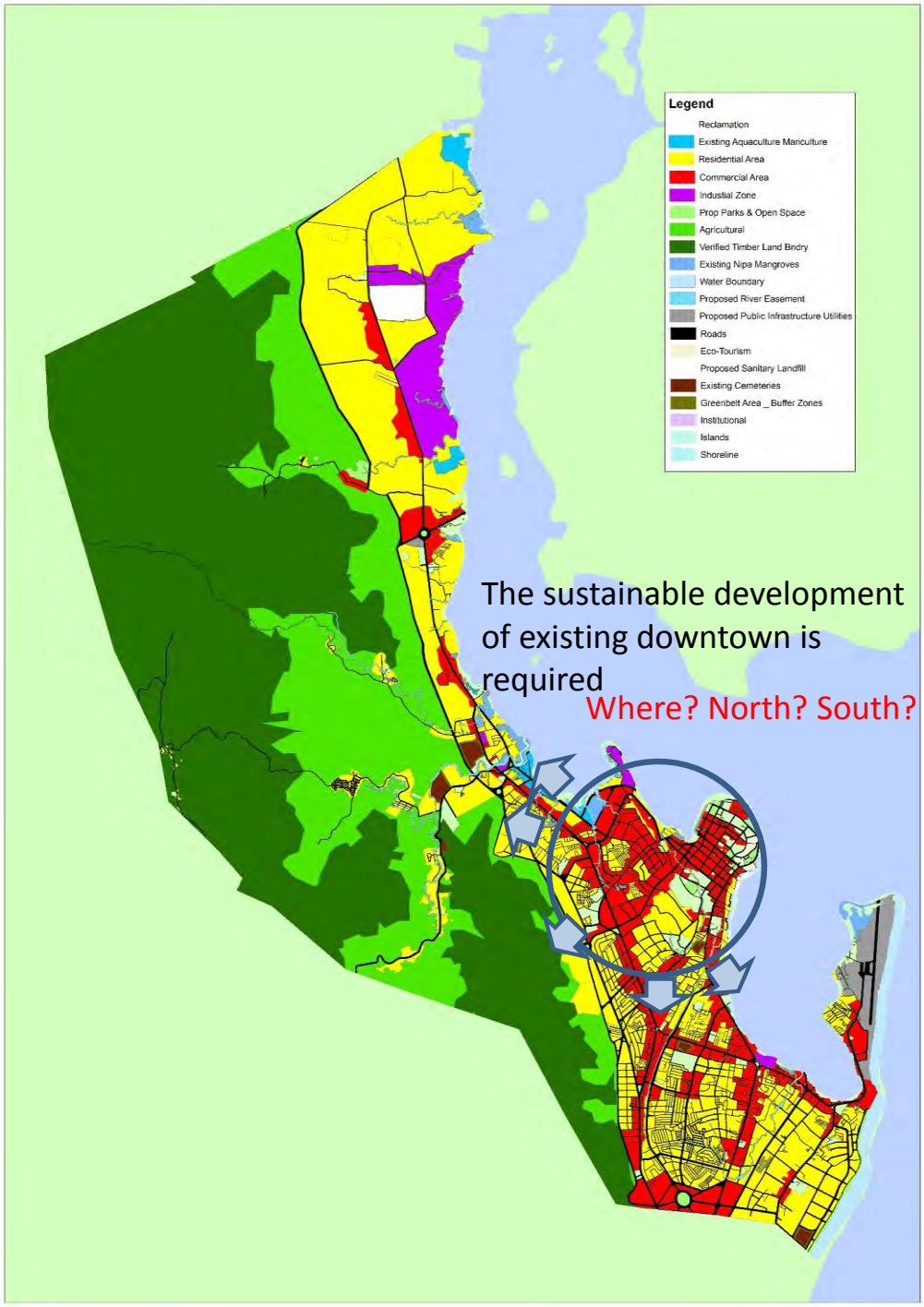
-Conceptual map was created.

Land use plan

-The detail should be discussed.

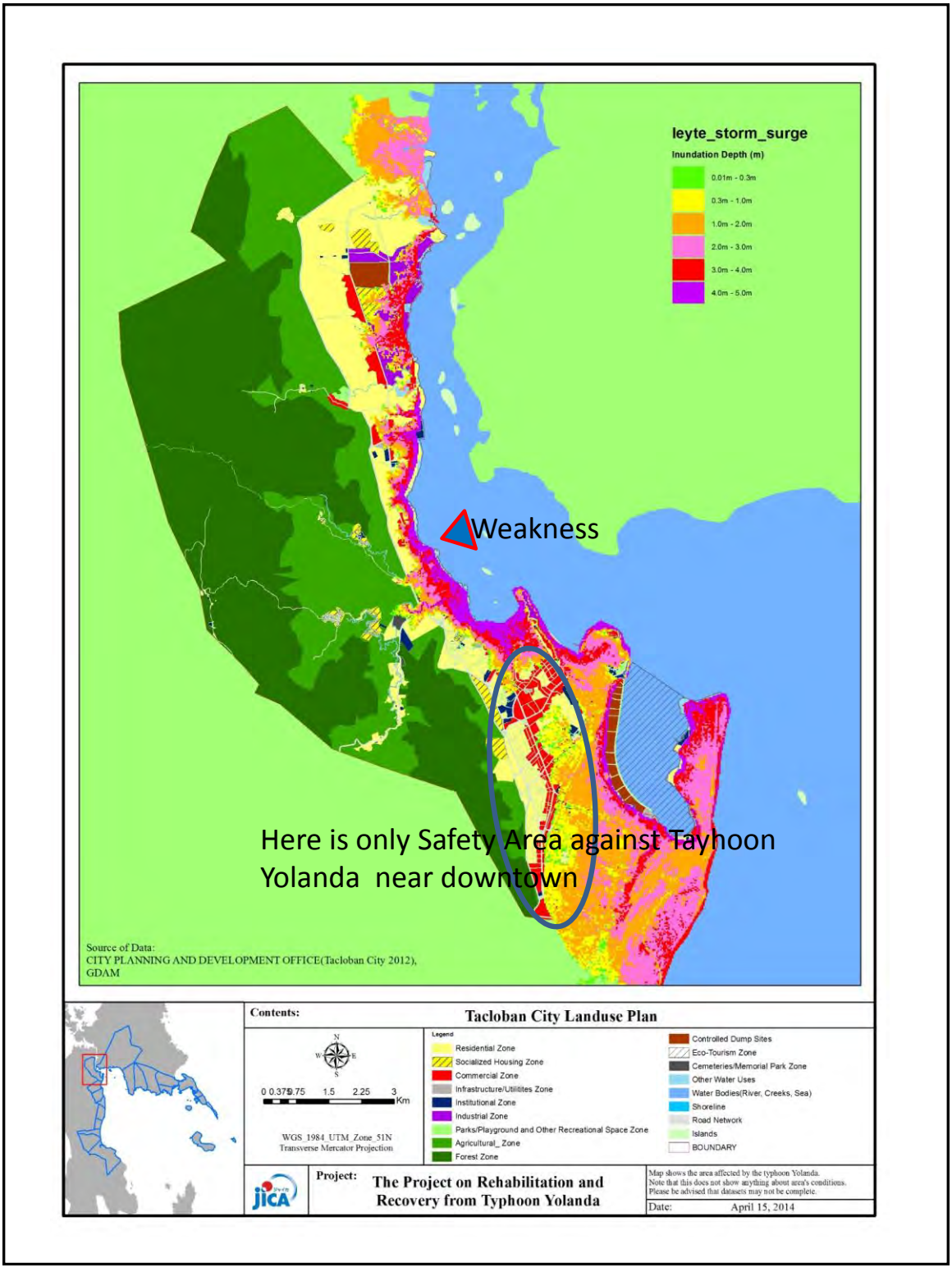


2016/4/19

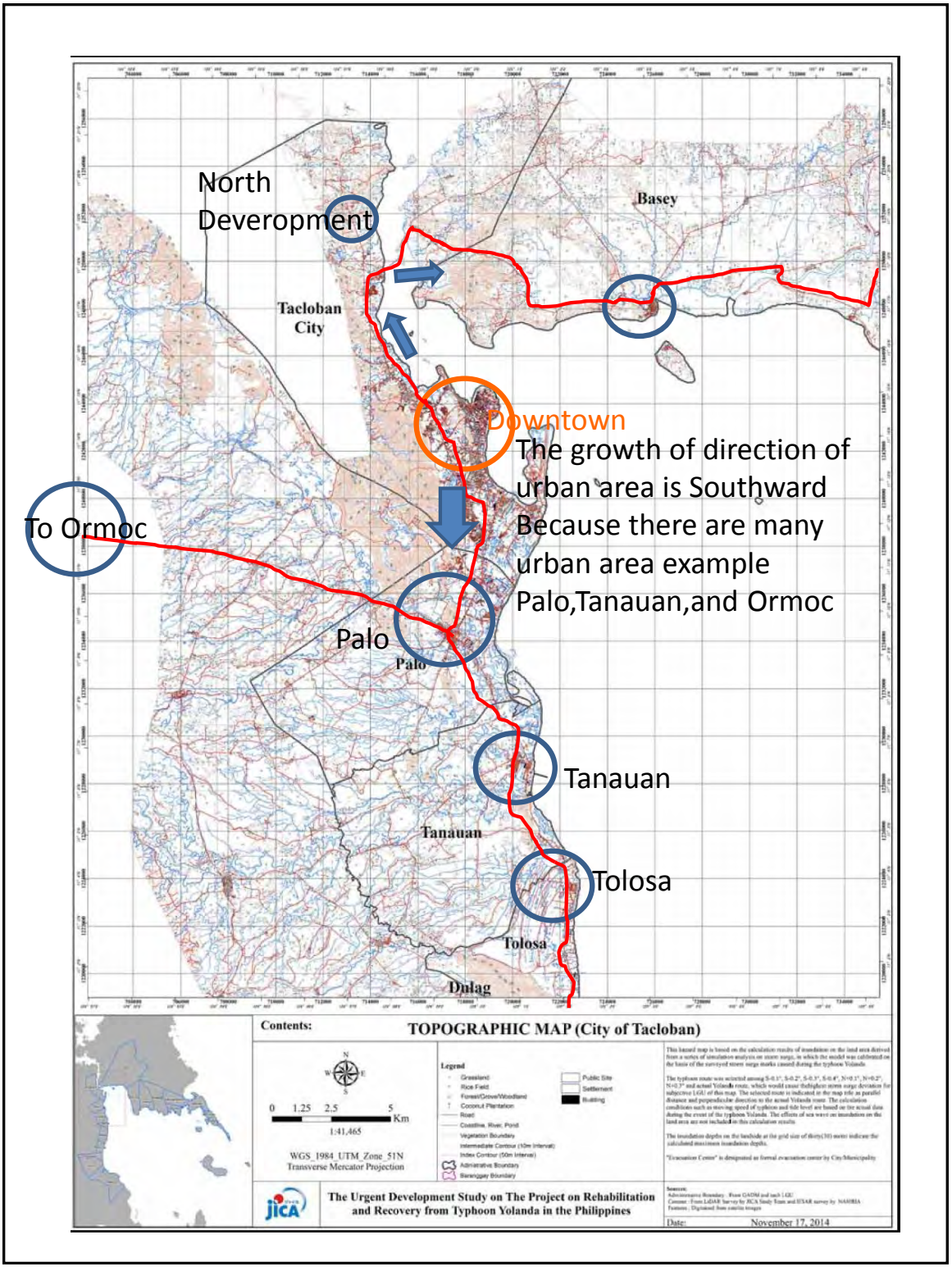

Legend
Reclamation
Existing Aquaculture Mariculture
Residential Area
Commercial Area
Industial Zone
Prop Parks & Open Space
Agricultural
Verified Timber Land Bndry
Existing Nipa Mangroves
Water Boundary
Proposed River Easement
Proposed Public Infrastructure Utilities
Roads
Eco-Tourism
Proposed Sanitary Landfill
Existing Cemeteries
Greenbelt Area _ Buffer Zones
Institutional
Islands
Shoreline
The sustainable development of existing downtown is required
Where? North? South?

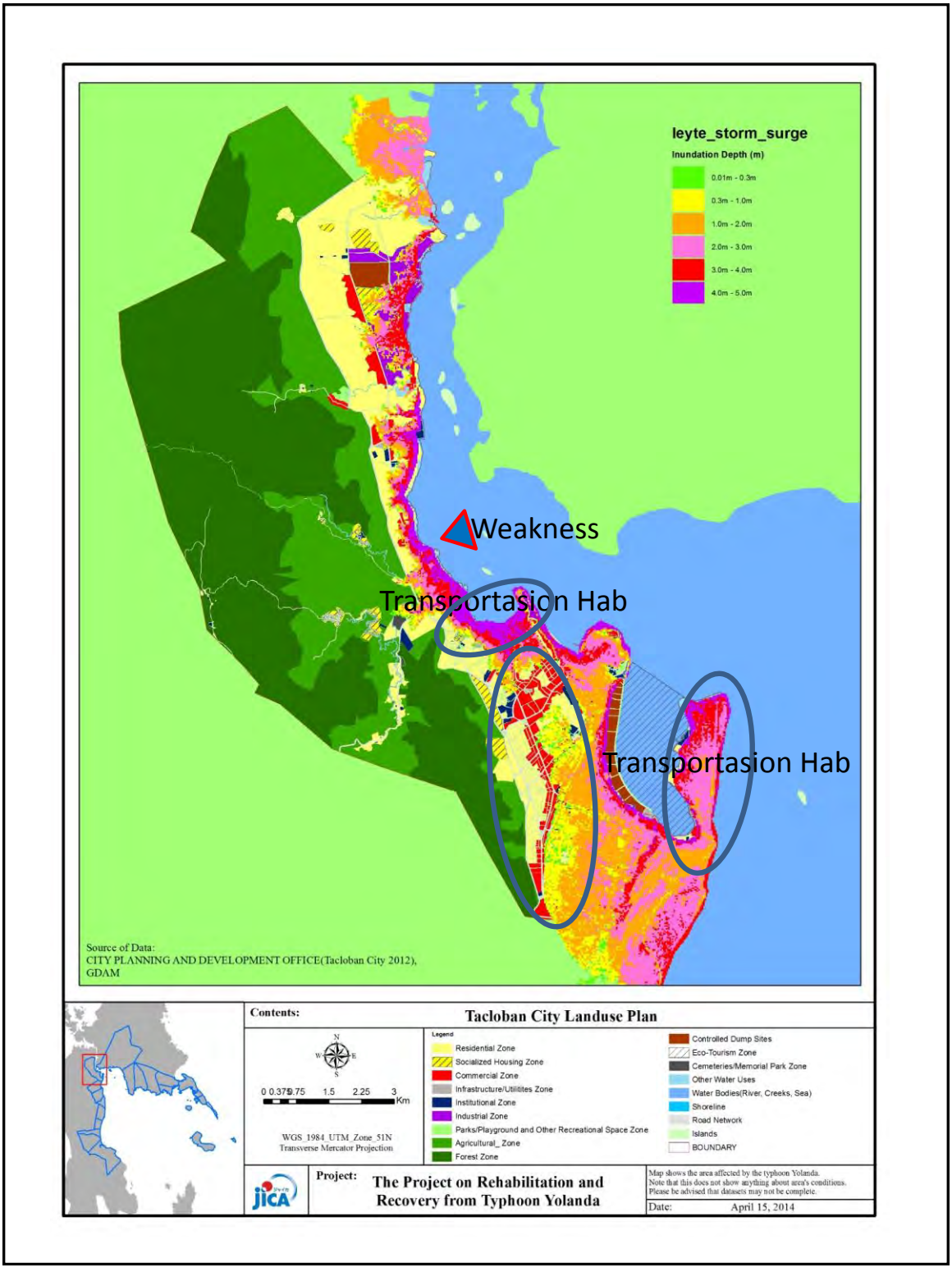
1

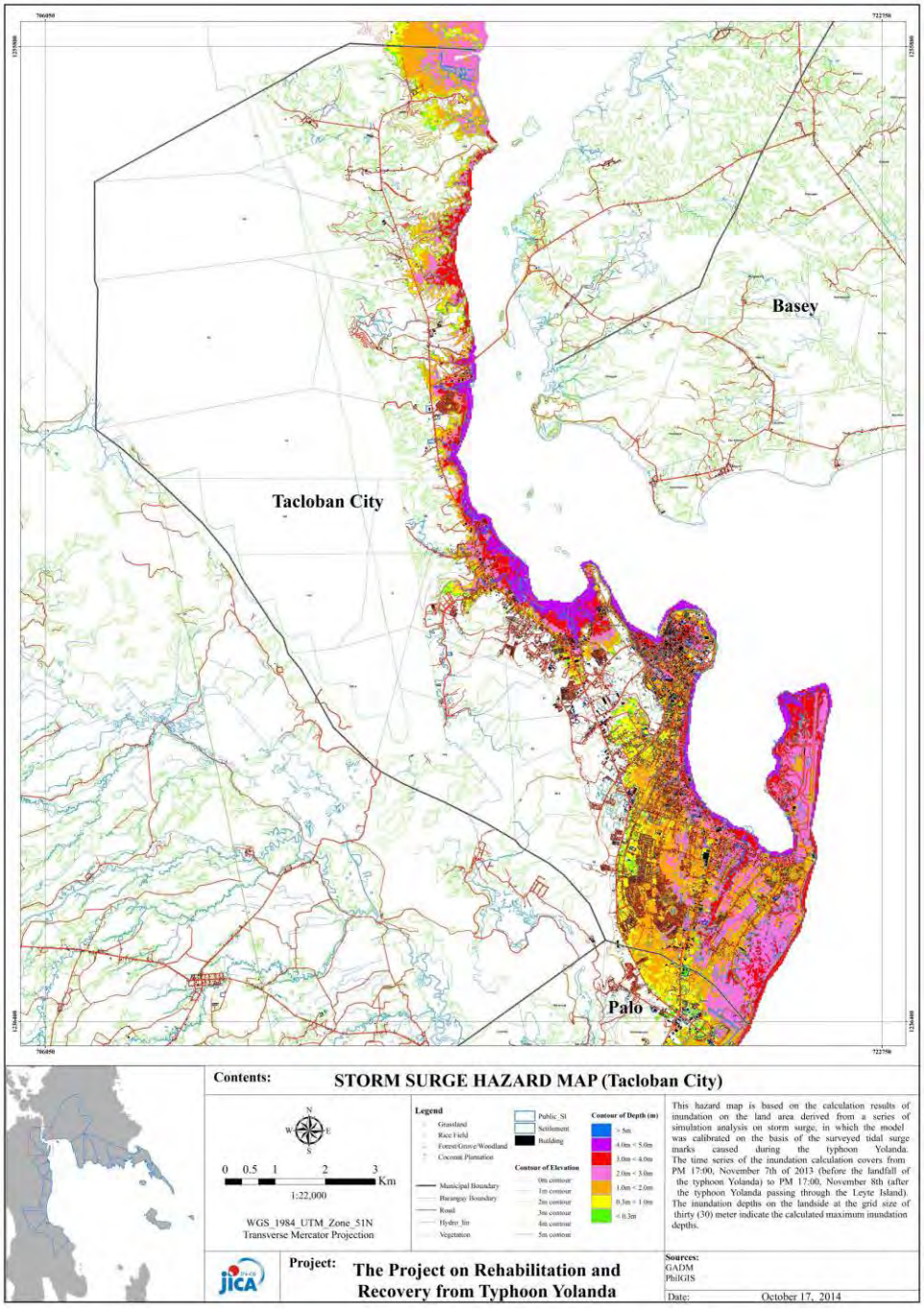
2016/4/19

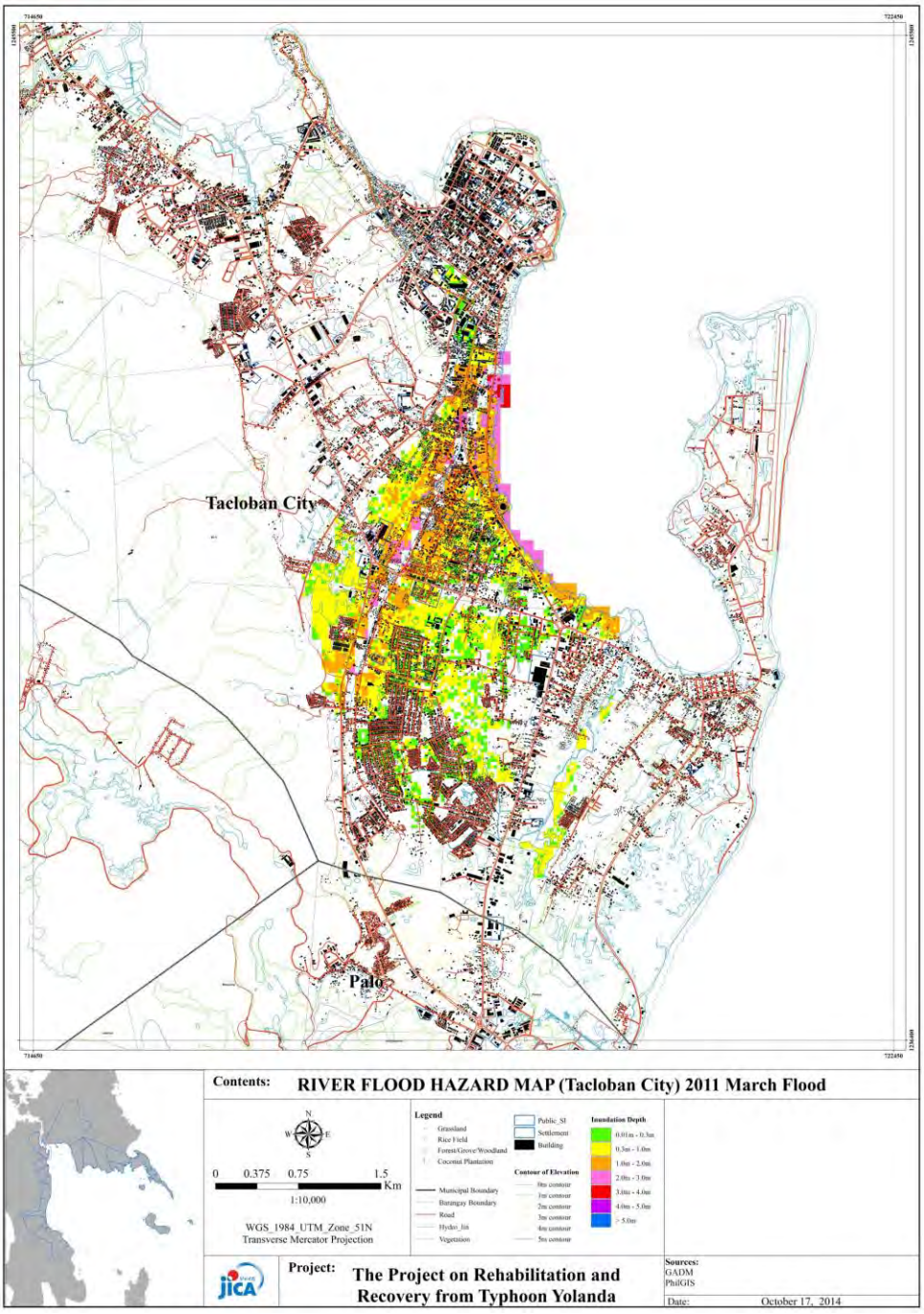

leyte_storm_surge
Inundation Depth (m)
0.01m - 0.3m
0.3m - 1.0m
1.0m - 2.0m
2.0m - 3.0m
3.0m - 4.0m
4.0m - 5.0m
Weakness
Here is only Safety Area against Tayhoon Yolanda near downtown
Source of Data:
CITY PLANNING AND DEVELOPMENT OFFICE(Tacloban City 2012),
GDAM
Contents:
Tacloban City Landuse Plan
Legend
Residential Zone
Socialized Housing Zone
Commercial Zone
Infrastructure/Utilitites Zone
Institutional Zone
Industrial Zone
Parks/Playground and Other Recreational Space Zone
Agricultural_ Zone
Forest Zone
Controlled Dump Sites
Eco-Tourism Zone
Cemeteries/Memorial Park Zone
Other Water Uses
Water Bodies(River, Creeks, Sea)
Shoreline
Road Network
Islands
BOUNDARY
0 0.375 0.75 1.5 2.25 3 Km
WGS_1984_UTM_Zone_51N
Transverse Mercator Projection
Project:
The Project on Rehabilitation and Recovery from Typhoon Yolanda
Map shows the area affected by the typhoon Yolanda.
Note that this does not show anything about area's conditions.
Please be advised that datasets may not be complete.
Date: April 15, 2014

2016/4/19


North
Deveropment
Basey
Tacloban
City
Downtown
The growth of direction of urban area is Southward Because there are many urban area example Palo,Tanauan,and Ormoc
To Ormoc
Palo
Palo
Tanauan
Tanauan
Tolosa
Tolosa
Dulag
Contents:
TOPOGRAPHIC MAP (City of Tacloban)
Legend
Grassland
Rice Field
Forest/Grove/Woodland
Coconut Plantation
Road
Coastline, River, Pond
Vegetation Boundary
Intermediate Contour (10m Interval)
Index Contour (50m Interval)
Administrative Boundary
Barangay Boundary
Public Site
Settlement
Building
0 1.25 2.5 5 Km
1:41,465
WGS_1984_UTM_Zone_51N
Transverse Mercator Projection
The Urgent Development Study on The Project on Rehabilitation and Recovery from Typhoon Yolanda in the Philippines
Date: November 17, 2014


leyte_storm_surge
Inundation Depth (m)
0.01m - 0.3m
0.3m - 1.0m
1.0m - 2.0m
2.0m - 3.0m
3.0m - 4.0m
4.0m - 5.0m
Weakness
Transportasion Hab
Transportasion Hab
Source of Data:
CITY PLANNING AND DEVELOPMENT OFFICE(Tacloban City 2012),
GDAM
Contents:
Tacloban City Landuse Plan
Legend
Residential Zone
Socialized Housing Zone
Commercial Zone
Infrastructure/Utilitites Zone
Institutional Zone
Industrial Zone
Parks/Playground and Other Recreational Space Zone
Agricultural_ Zone
Forest Zone
Controlled Dump Sites
Eco-Tourism Zone
Cemeteries/Memorial Park Zone
Other Water Uses
Water Bodies(River, Creeks, Sea)
Shoreline
Road Network
Islands
BOUNDARY
0 0.375 0.75 1.5 2.25 3 Km
WGS_1984_UTM_Zone_51N
Transverse Mercator Projection
Project:
The Project on Rehabilitation and Recovery from Typhoon Yolanda
Map shows the area affected by the typhoon Yolanda.
Note that this does not show anything about area's conditions.
Please be advised that datasets may not be complete.
Date: April 15, 2014


Basey
Tacloban City
Palo
Contents:
STORM SURGE HAZARD MAP (Tacloban City)
Legend
Grassland
Rice Field
Forest/Grove/Woodland
Coconut Plantation
Municipal Boundary
Barangay Boundary
Road
Hydro_3in
Vegetation
Public_St
Settlement
Building
Contour of Depth (m)
> 5m
4.0m < 5.0m
3.0m < 4.0m
2.0m < 3.0m
1.0m < 2.0m
0.3m < 1.0m
< 0.3m
Contour of Elevation
0m contour
1m contour
2m contour
3m contour
4m contour
5m contour
0 0.5 1 2 3 Km
1:22,000
WGS_1984_UTM_Zone_51N
Transverse Mercator Projection
This hazard map is based on the calculation results of inundation on the land area derived from a series of simulation analysis on storm surge, in which the model was calibrated on the basis of the surveyed tidal surge marks caused during the typhoon Yolanda. The time series of the inundation calculation covers from PM 17:00, November 7th of 2013 (before the landfall of the typhoon Yolanda) to PM 17:00, November 8th (after the typhoon Yolanda passing through the Leyte Island). The inundation depths on the landside at the grid size of thirty (30) meter indicate the calculated maximum inundation depths.
Project:
The Project on Rehabilitation and Recovery from Typhoon Yolanda
Sources:
GADM
PhilGIS
Date:
October 17, 2014


Tacloban City
Palo
Contents:
RIVER FLOOD HAZARD MAP (Tacloban City) 2011 March Flood
Legend
Inundation Depth
Contour of Elevation
0 0.375 0.75 1.5 Km
1:10,000
WGS_1984_UTM_Zone_51N
Transverse Mercator Projection
Project:
The Project on Rehabilitation and Recovery from Typhoon Yolanda
Sources:
GADM
PhilGIS
Date: October 17, 2014

Review from JICA Study Team to proposed land use from Architect Danny

Suggested revision in land use for the Apitong area (near ultrasteel area) from residential to commercial. This could be the new CBD for the city. It is safe from storm surge. And it is protected from the winds coming from the east by the hills. (Figure. 1)

1. The suggestion to build new CBD at the Apitong area is effective because of safety. However, the distance from existing downtown and the existing city hall should be considered. It is the best if new CBD can be continuous from urban function (existing downtown and the city hall), but the new CBD will be "enclave"

2. In this case, development of transportation system is important to support the new CBD. Proposed national road is effective and tuank road in the CBD should be also developed. Road density should be considered.

3. Details of future land use should be discussed whether residential zone or commercial zone. How commercial area should be expanded and where should be retained as residential area.
The area along road should be developed as commercial zone, so conversion of the area of the new CBD from residential zone to commercial zone, yellow to red, should be considered. On the other hand, we can retain this area as residential zone because this area is margin of urban area from the view of whole of city. It depends on the current situation of the area.

4. Because there is wetland around this area (north of the area?), inundation by heavy rain should be considered. Also, development as "commercial water front area" can be adopted, using piloti-type of building.

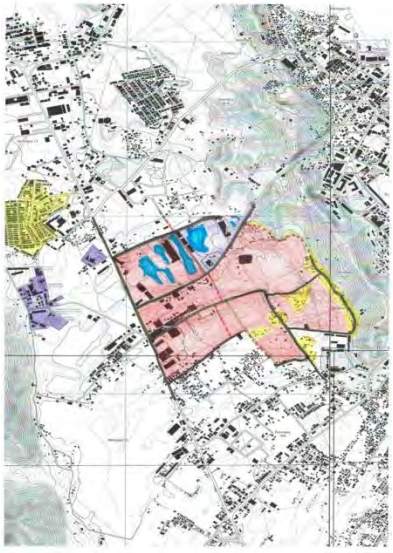


Figure. 1 Suggested the new CBD area

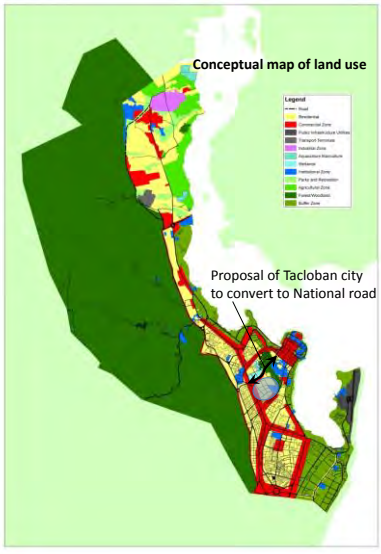


Figure. 2 The location of the new CBD

2016/4/19

Area Management Meeting

Introduction of area management

Tacloban city
July 30

DPWH will construct structure measures along shore line.

The area along the structure will be protected.

⇩

Strategically, the area should be developed.

What is "Strategically"???

-The area with good location/ access and potential for future development is focused on.

-Various stakeholders and various sectors can collaborate.

⇩

Area management will be carried out at San Jose area

2016/4/19

Area management is …

Area management is proactive activities by LGUs, business (chambers of commerce), land owner and residential people to enhance the value of the area.

Example of the activities
-Discuss and propose suitable plan for the area, involving various sector (Ex. Plan of structure measure and CLUP)
-Committee member, especially private sector, alternates the role of public service instead of LGUs.
-Operation and management of public infrastructure/ facilities

San Jose area has …
-Good access to downtown and airport.
-Various stakeholders such as San Jose market, Mayor restaurant, Tacloban ice factory, hotel and church as well as school.

Three Stages of Area Management

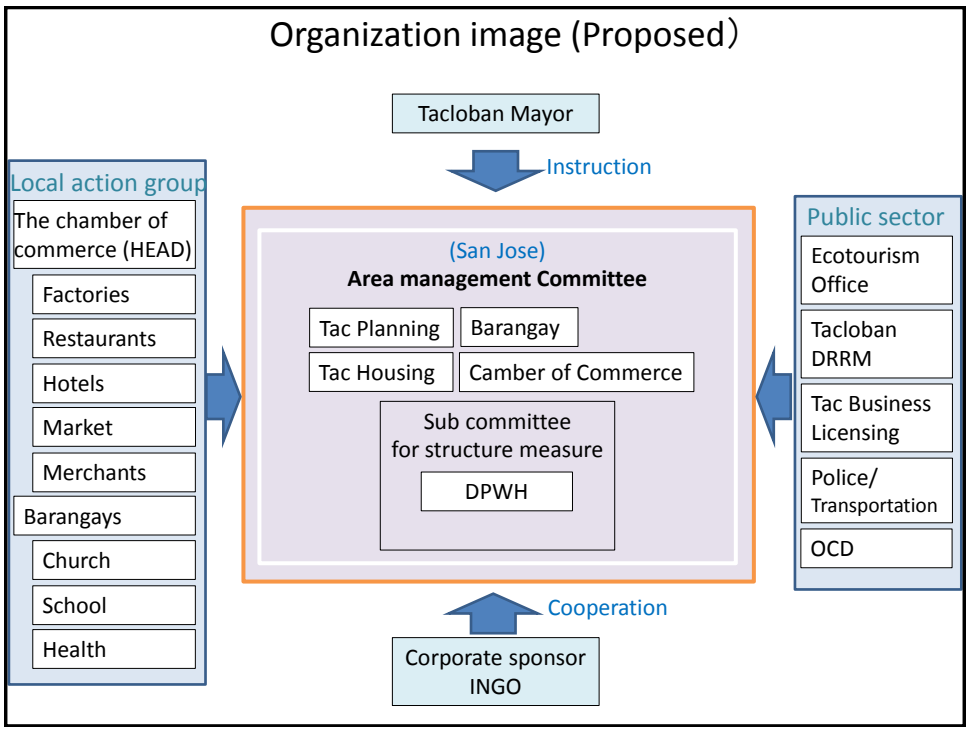
Stage 1 Planning & Development Stage
① Share of the future image of the Area
② Share of the regional rules of the Area
③ Establishment of the Management Organizational Structure (Such as the Town Planning Council)

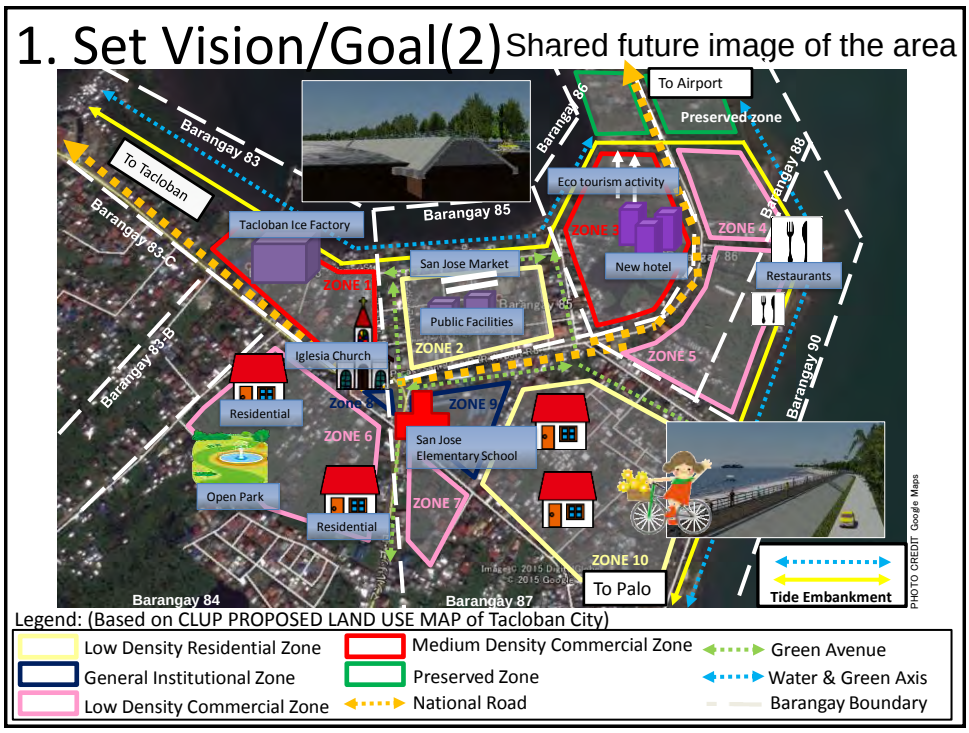
Stage 2 Maintenance and Management Stage
① Maintenance and management of public facilities, etc.
② Developing a good urban environment

Stage 3 Operation Stage
① Formation of a "organize and resilient community"
② Formation of the "safety and security" of the town
③ Information dissemination and promotion in the town
④ Ensure activity funds

Proceeding to all of stages takes a lot of time, so firstly we will focus on step 1 and 2 at stage 1.

2016/4/19


Organization image (Proposed）
Tacloban Mayor
Instruction
Local action group
The chamber of commerce (HEAD)
Factories
Restaurants
Hotels
Market
Merchants
Barangays
Church
School
Health
(San Jose)
Area management Committee
Tac Planning
Barangay
Tac Housing
Camber of Commerce
Sub committee for structure measure
DPWH
Public sector
Ecotourism Office
Tacloban DRRM
Tac Business Licensing
Police/ Transportation
OCD
Cooperation
Corporate sponsor INGO


1. Set Vision/Goal(2) Shared future image of the area
To Airport
Preserved zone
Barangay 86
Barangay 88
Barangay 83
To Tacloban
Barangay 83-C
Barangay 85
Eco tourism activity
Tacloban Ice Factory
San Jose Market
New hotel
Restaurants
Public Facilities
Barangay 83-B
Iglesia Church
Residential
San Jose Elementary School
Barangay 90
Open Park
Residential
Barangay 84
Barangay 87
To Palo
Tide Embankment
PHOTO CREDIT Google Maps
Legend: (Based on CLUP PROPOSED LAND USE MAP of Tacloban City)
Low Density Residential Zone
General Institutional Zone
Low Density Commercial Zone
Medium Density Commercial Zone
Preserved Zone
National Road
Green Avenue
Water & Green Axis
Barangay Boundary

2016/4/19

Create the new commerce base

Advanced cases Great East Japan Earthquake
There are many attractive Facility along the cycling road

IWAKI CYCKING ROAD

michinoeki yotsukurakou

AcuaMarin Fukushima

Create the Green Recreation area

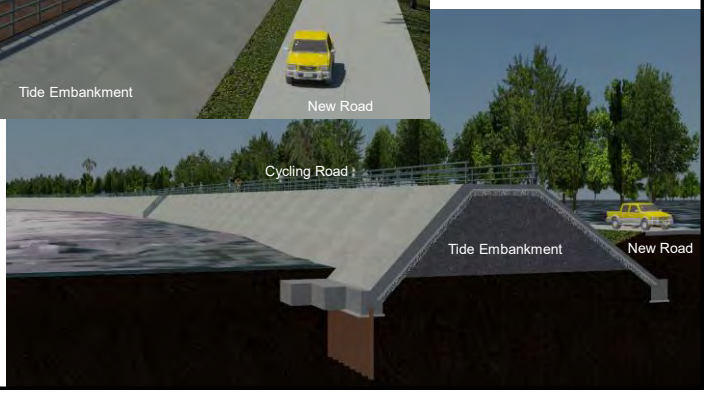
Tide Embankment with cycling road for Tacloban City and Palo

Cycling Road

Tide Embankment

New Road

Future Image.



Cycling Road

Tide Embankment

New Road

2016/4/19

Create the Green Recreation area

Advanced cases

Great East Japan Earthquake

Greening of tidal embankment
Kesennuma City Japan

Create the Green Recreation area

Advanced cases Great East Japan Earthquake

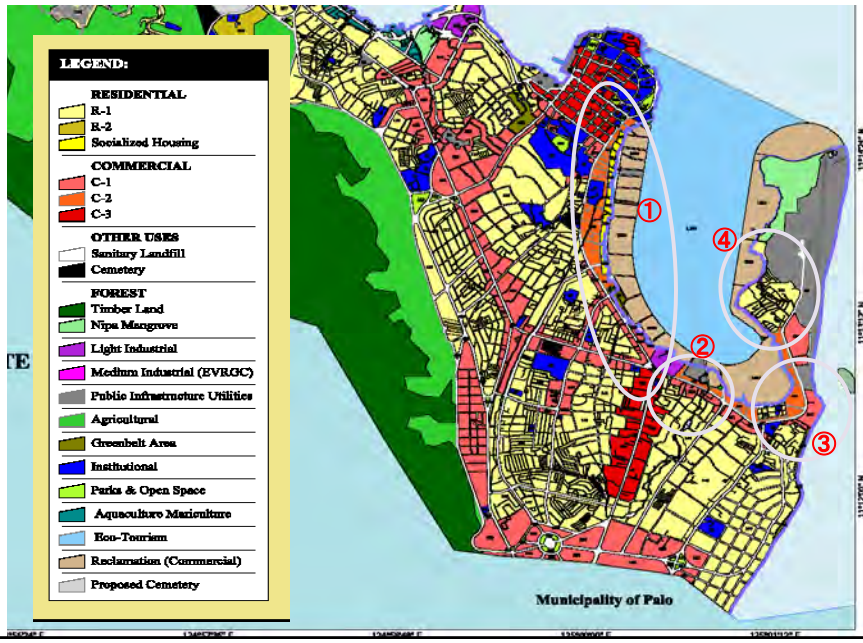
We don't need to feel the pressure of 11.3m.

Aratanimae coast , Kesennuma City Japan 11.3m
Under construction ⇒ 2016 March

2016/4/19

Session 1

FUTURE LAND USE



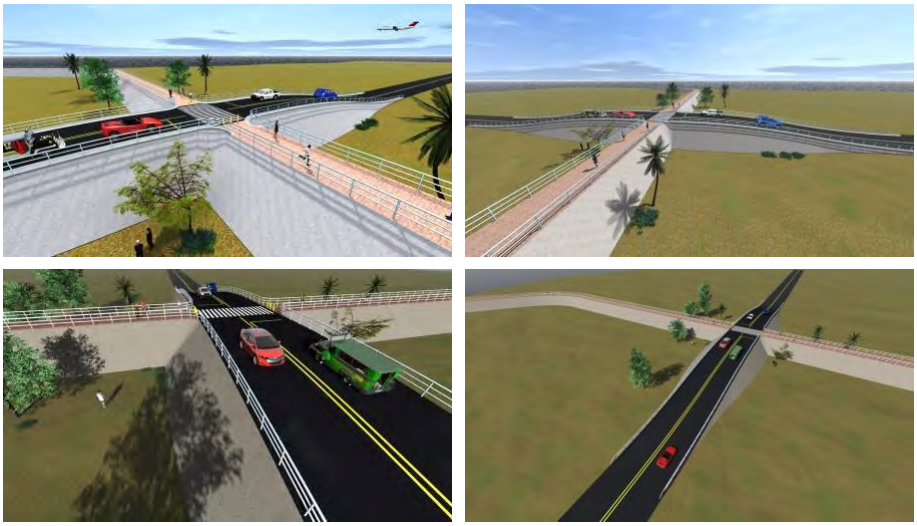
06/06

Session 1

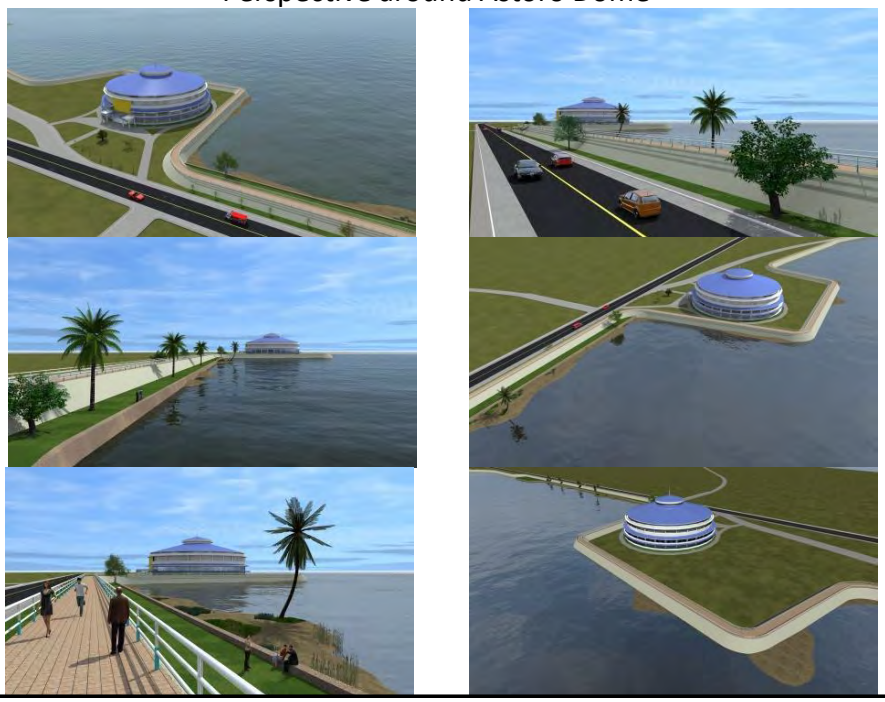
	Current status and issues	Direction of land use
①	-If the aim of reclamation is to change NBZ to BZ, there's no need anymore, because the land will be protected by the tidal embankment -If the land will be used for recreation zone, there's a need to review on how the embankment will complement the area	-No reclamation -Review of residential land use along tidal embankment (protected side)
②	-Same as ①. -There's a need to review the public facilities (i.e. fishery market) because it's declared not to be used after Typhoon Yolanda.	-No reclamation -Revitalization of public facilities (more discussion needed)
③	-Tidal embankment passing along the inland area -Issue about intersection of the road to airport -Issue about land use of north area of tidal embankment -Issue about seaside restaurant (cover seashore by tidal embankment or not)	-North area, tidal embankment will be preservation area, but it can be utilized as for commercial use, as long as non-residential use. (more discussion needed) -Review and revise the land use of the area beside the tidal embankment and also the road going to the airport
④	-The areas outside of tidal embankment. -How to manage the residential area outside of embankment. Some area not in the No-build-Zone, so they are not the target for relocation.	-Land use of residential area (more discussion needed) -Commercial use is acceptable as long as non-residential use. (more discussion needed)

05/06

Perspective around intersection between San Jose area and airport area



Perspective around Astoro Dome



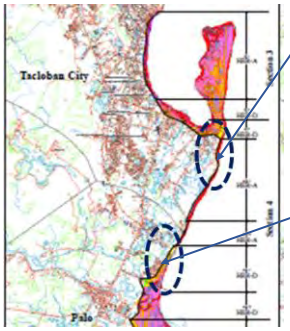
Appendix-9: Presentation materials of JICA Study Team (Palo Municipality) and Project profileofarea management

2016/4/19

Updating the Land Use Plan based on Hazard Map

We are going to support on updating the Land Use Plan

Contents

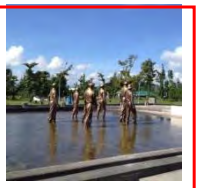


Area management Planning

①Tacloban City：
・Policy discussion
・Introduction of proposed land use and development examples
Ex) Commercial Zone development

②：Palo:
・Policy discussion
・Introduction of proposed land use and development plan

Ex) Development plan for sightseeing base tourist spot



What is “Area Management”?

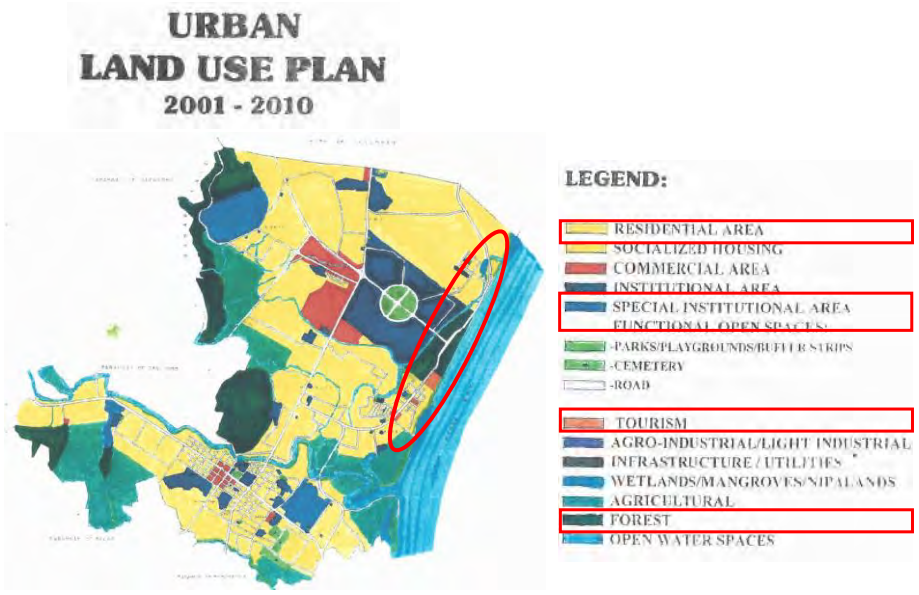
Stage 1 Planning & Development Stage
① Share the future image of the area
② Share the regional rules of the area
③ Establishment of the Management Organizational Structure
(Such as the Town Planning Council （Committee)

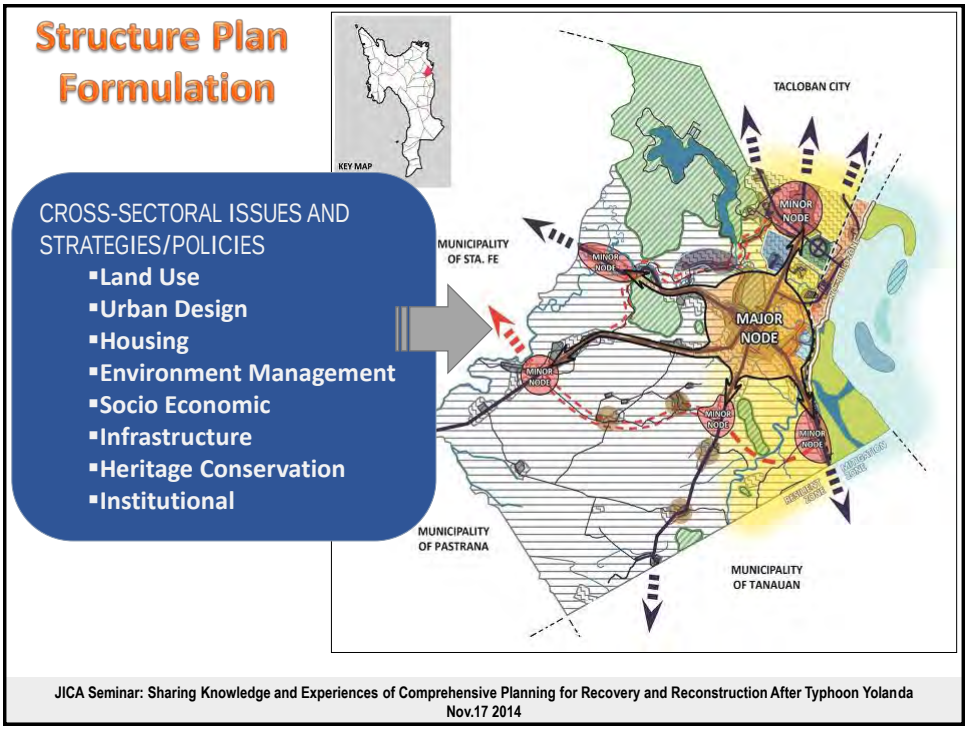
Stage 2 Maintenance and Management Stage
① Maintenance and management of the public facilities and etc.
② Developing a good urban environment

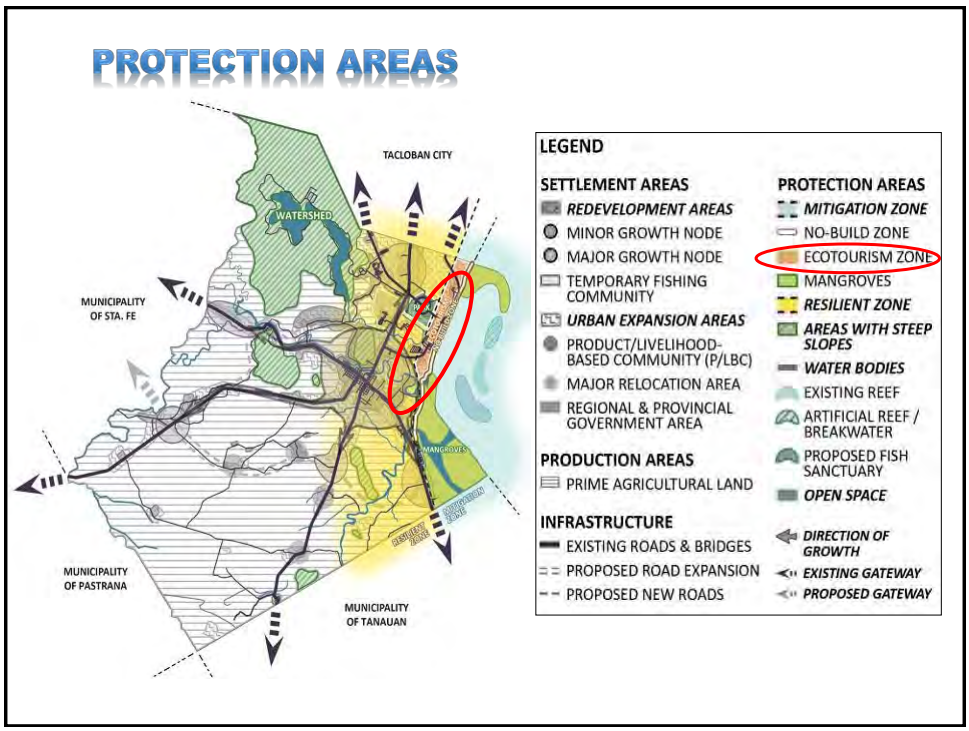
Stage 3 Operation Stage
① Formation of a “organize and resilient community”
② Formation of the ”safety and security” of the town
③ Information dissemination and promotion in the town
④ Ensure activity funds

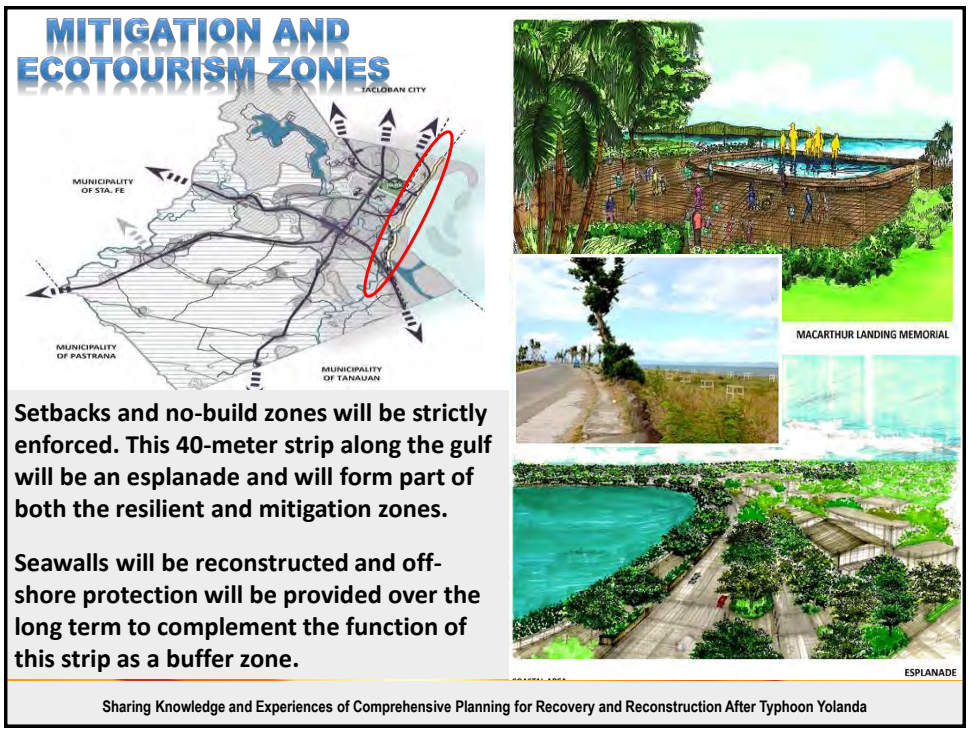
Studying the 3 stages takes a lot of time, so this time we will only focus on stages 1 / step① and ② or ③

Example STUDY

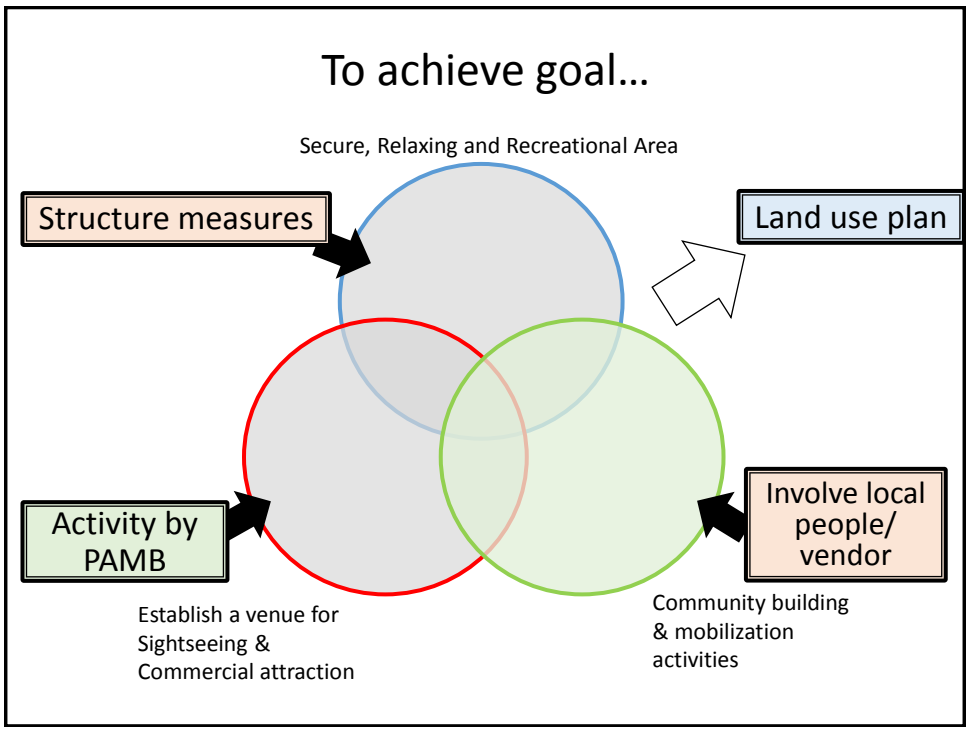


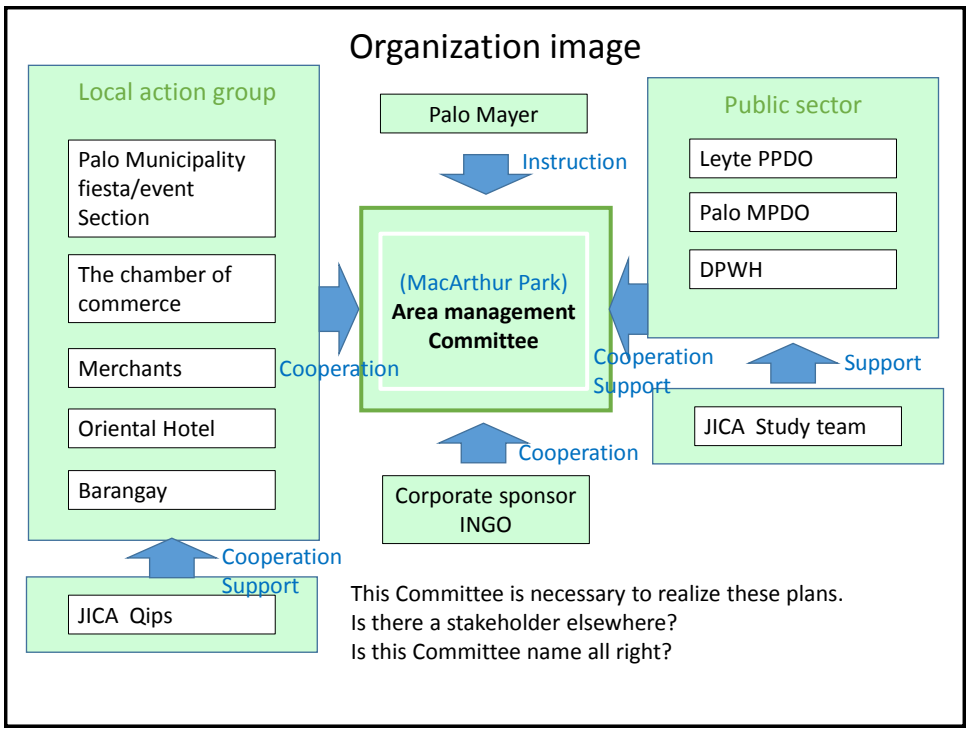



PROTECTION AREAS
TACLOBAN CITY
WATERSHED
MUNICIPALITY OF STA. FE
MUNICIPALITY OF PASTRANA
MUNICIPALITY OF TANAUAN
LEGEND
SETTLEMENT AREAS
REDEVELOPMENT AREAS
MINOR GROWTH NODE
MAJOR GROWTH NODE
TEMPORARY FISHING COMMUNITY
URBAN EXPANSION AREAS
PRODUCT/LIVELIHOOD-BASED COMMUNITY (P/LBC)
MAJOR RELOCATION AREA
REGIONAL & PROVINCIAL GOVERNMENT AREA
PRODUCTION AREAS
PRIME AGRICULTURAL LAND
INFRASTRUCTURE
EXISTING ROADS & BRIDGES
PROPOSED ROAD EXPANSION
PROPOSED NEW ROADS
PROTECTION AREAS
MITIGATION ZONE
NO-BUILD ZONE
ECOTOURISM ZONE
MANGROVES
RESILIENT ZONE
AREAS WITH STEEP SLOPES
WATER BODIES
EXISTING REEF
ARTIFICIAL REEF / BREAKWATER
PROPOSED FISH SANCTUARY
OPEN SPACE
DIRECTION OF GROWTH
EXISTING GATEWAY
PROPOSED GATEWAY


MITIGATION AND ECOTOURISM ZONES
TACLOBAN CITY
MUNICIPALITY OF STA. FE
MUNICIPALITY OF PASTRANA
MUNICIPALITY OF TANAUAN
Setbacks and no-build zones will be strictly enforced. This 40-meter strip along the gulf will be an esplanade and will form part of both the resilient and mitigation zones.
Seawalls will be reconstructed and off-shore protection will be provided over the long term to complement the function of this strip as a buffer zone.
MACARTHUR LANDING MEMORIAL
ESPLANADE
Sharing Knowledge and Experiences of Comprehensive Planning for Recovery and Reconstruction After Typhoon Yolanda

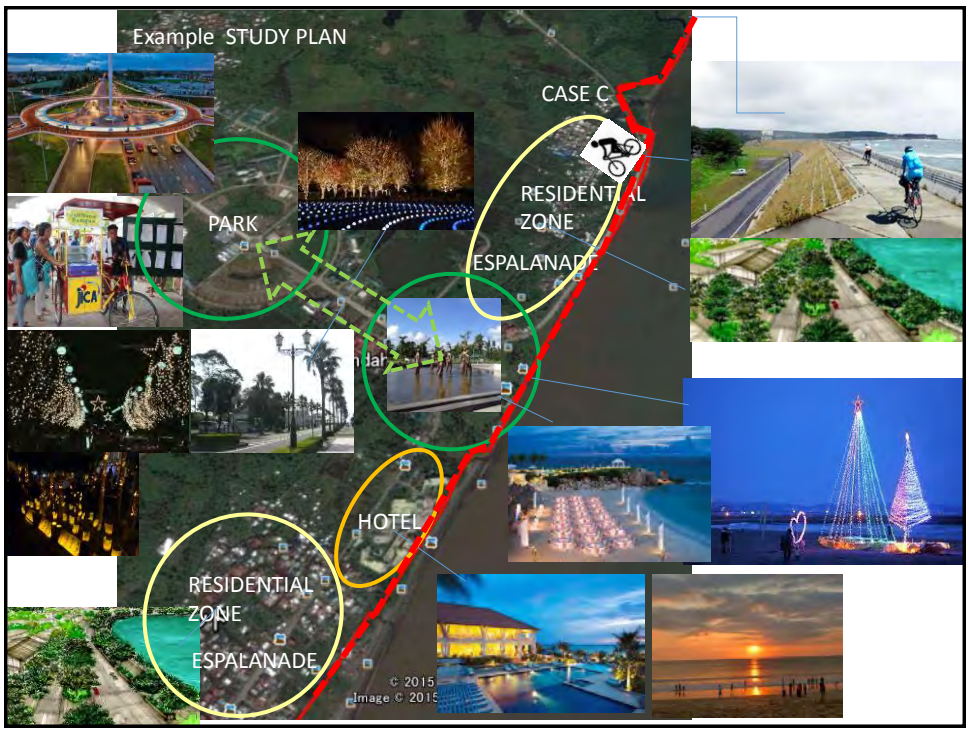
2016/4/19

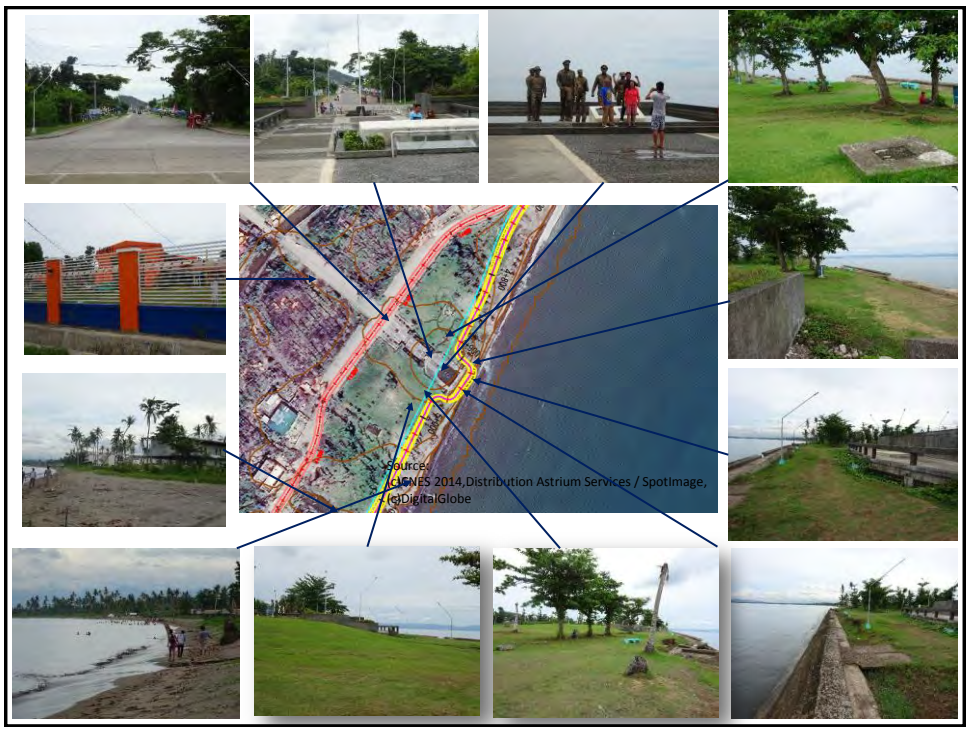

To achieve goal…
Secure, Relaxing and Recreational Area
Structure measures
Land use plan
Activity by PAMB
Involve local people/ vendor
Establish a venue for Sightseeing & Commercial attraction
Community building & mobilization activities

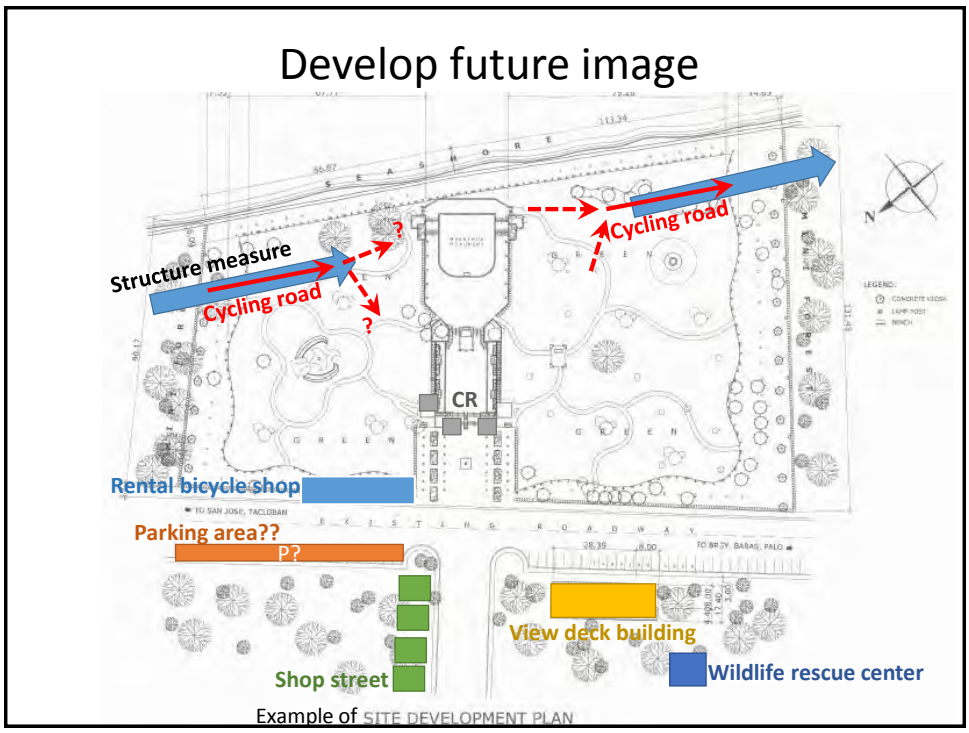

Organization image
Local action group
Palo Municipality fiesta/event Section
The chamber of commerce
Merchants
Oriental Hotel
Barangay
Cooperation
Support
JICA Qips
Palo Mayer
Instruction
(MacArthur Park)
Area management Committee
Cooperation
Corporate sponsor INGO
Public sector
Leyte PPDO
Palo MPDO
DPWH
Cooperation
Support
Support
JICA Study team
This Committee is necessary to realize these plans.
Is there a stakeholder elsewhere?
Is this Committee name all right?

2016/4/19


Example STUDY PLAN
CASE C
RESIDENTIAL ZONE
PARK
ESPALANADE
MACATHER LANDIG MEMORIAL
HOTEL
RESIDENTIAL ZONE
ESPALANADE
© 2015 Google
Image © 2015 DigitalGlobe

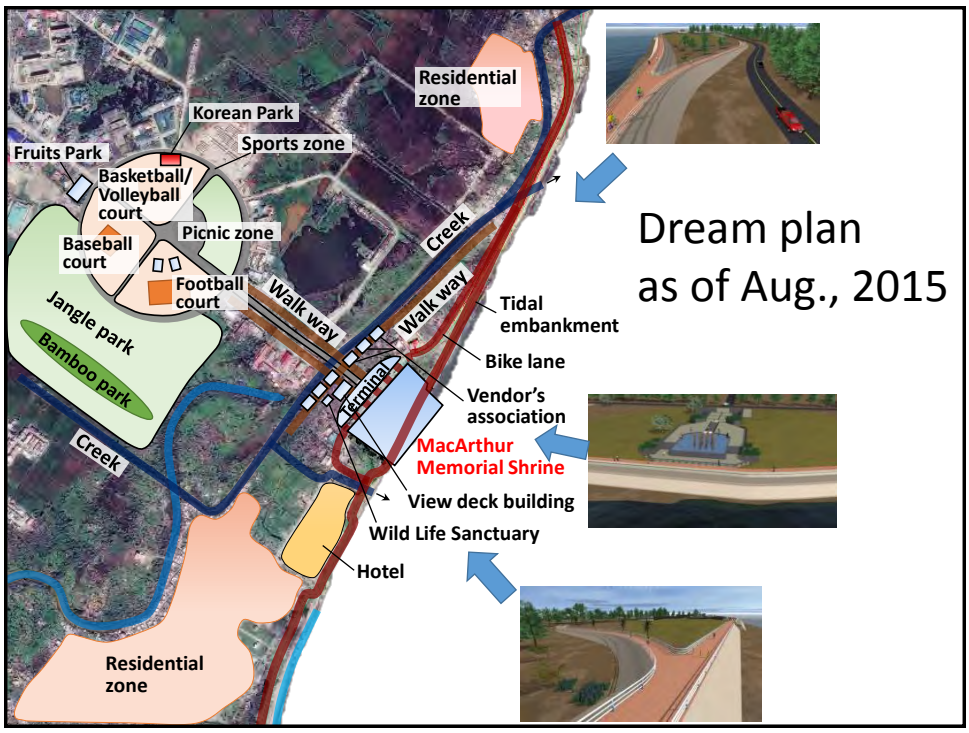

Example STUDY PLAN
CASE C
RESIDENTIAL ZONE
PARK
ESPALANADE
HOTEL
RESIDENTIAL ZONE
ESPALANADE


Source:
CNES 2014,Distribution Astrium Services / SpotImage,
(c)DigitalGlobe


Develop future image
Structure measure
Cycling road
Cycling road
CR
Rental bicycle shop
Parking area??
P?
View deck building
Shop street
Wildlife rescue center
Example of SITE DEVELOPMENT PLAN

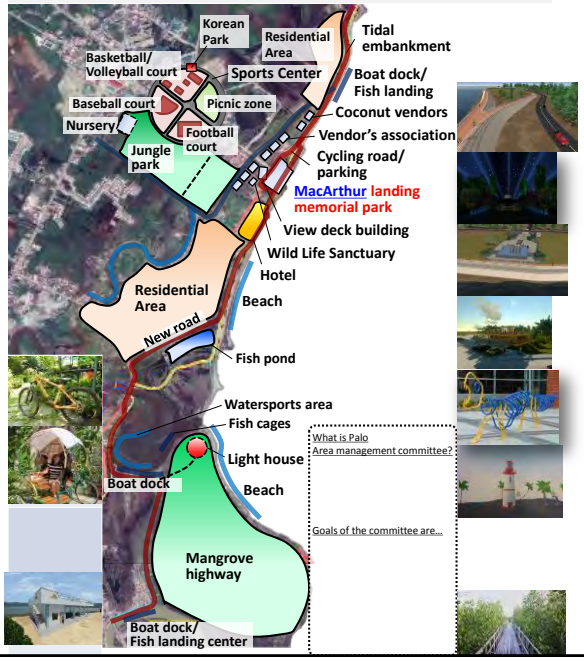
3 levels of future image

1. Macather Landing Memorial Park
2. Target area
3. Additional area including light house



Palo Future Plan –Around MacArthur park

Discussed at Palo Area Management Committee



Dream plan
as of Sep., 2015

Dream plan as of October, 2015

PALO CLUP DRAFT Vol.1

1. DPWH Project
   (Road Heighteninig & Tide Embankment)

2. JICA Hazed Map

3. Area Management (Dream Plan)

PALO CLUP DRAFT Vol.1

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1.7 Road Heightening & Tide Embankment

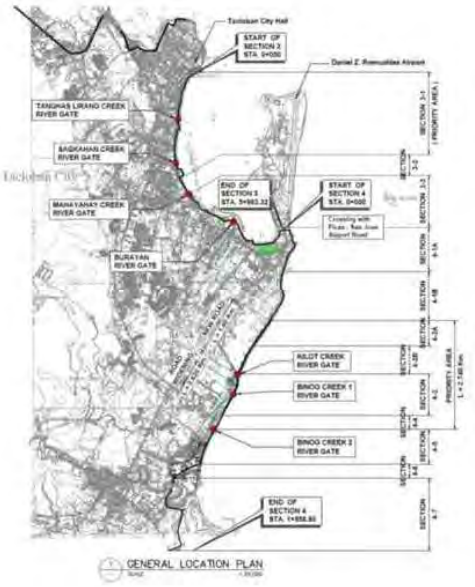
1.7 Road Heighteninig & Tide Embankment

Project Outline

Project Title : *Project on Road Heightening and Tide Embankment for Section 3 and 4*
Project Area : *Tacloban City and Palo Municipality in Leyte (Region VIII)*
Implementation Agency : *DPWH*
Finance : *DPWH(100%)*

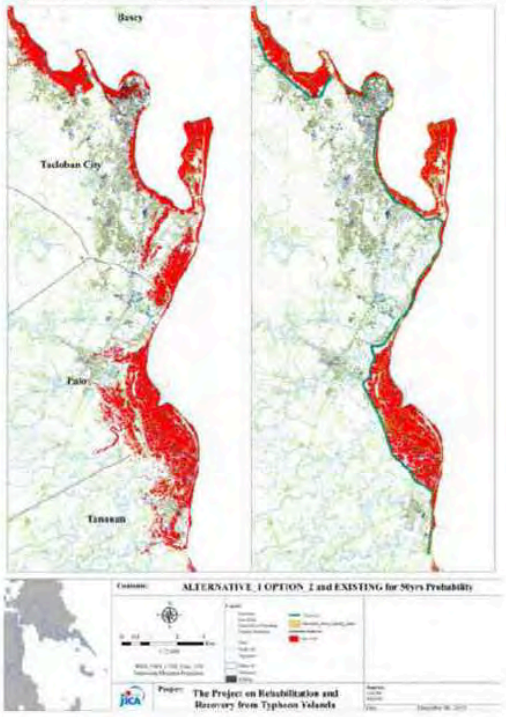
Design conditions and type of structure

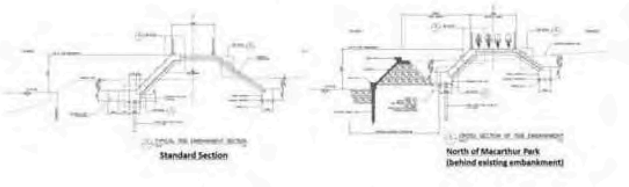
Prection level: *Storm surge of 50 years return period*
Top elevation: *MSL+4.0m (Section 3) and MSL+3.5m (Section 4)*
** Top elevation is MSL+3.5m in Palo section.*



1-45

Reduction of inundation depth by embankment on 50 years return period storm-surge





1.7 Road Heighteninig & Tide Embankment

1.7 → 1.8 Infrastructure,Facilities and Utilities

1-38

B1. Road Projects

- Construction of Palo Orbital Road
- Trading Posts/Tabo Market Covered Road
- Construction of Guindapunan-Sitio Caloogan - Campetik Road
- Rehab/Improvement of 4.970 km. Brgy. San Antonio-Sitio Tahaw FMR
- Rehab/Improvement of 4.020 km. Brgy. San Agustin-Cabarasan FMR
- Rehab/Improvement of damaged road in NHA, Baras, Palo.

1-45 I-45

- Construction of Concrete Pavement of Driveway, Palo Municipal Compound
- Repair /Re-blocking of Municipal Streets
- Construction of Sidewalks and Canals along municipal streets
- Construction of concrete road shouldering along municipal streets

B2. Bridge Projects

- Construction Tacuranga Reinforced Concrete Deck Girder Bridge (RCDGB)
- Arado-San Jose Bailey-type Steel Bridge

B3. Transport Facilities Projects

- Construction of Multi-Modal Transport Terminal

1-46

B4. Cycling Road

Goals for Transportation

- Complete the paving of Barangay Roads;
- Widen National Roads;
- Expand existing airport facilities and airport operations;
- Expand and improve access to port areas; and
- Construct northbound and southbound terminals.
- Construct cycling road from Tacloban to Tanauan

2-2

- Establish a nature trail, with picnic points / lakeshore areas / photo opportunity points to contribute to the Eco-Tourism Plan of Palo; and
- Construct sustainable eco-tourism facilities.
- Develop eco-tourism and mangrove highway by utilize cycling road

2-3

B. **Tourism**

Goals

- Ecologically sound tourism sector of the municipality
- Optimum benefits from the tourism sector

Objectives

- Promote the city's tourism potential as a potential contributor to local economic growth; and
- Protect, preserve and promote built and natural heritage sites in terms of disaster and risk resiliency.

- Relation between city's tourism and coastal tourism

2-8

B. **International Aid Agencies and NGOs**

Response to Typhoon Yolanda came not only from the local sector but from international aid agencies and NGOs. These response programs were varied, to include: provision of shelter, livelihood recovery, feeding, hygiene and sanitation, and general relief. Some organizations, like Plan International and Save the Children-Philippines, focused aid on sectors affecting children. Many organizations focused on sanitation and hygiene programs. Other projects and programs include rehabilitation of schools, day care centers, and health facilities; disaster preparedness, and child protection.

2-15

Table 2-2

AGENCY	PROJECTS	PERTNER AGENCIES
JICA	▪ Area Management ▪ Evacuation Plan ▪ Hospital in province zone	

2-16

2.3.2 Assessment of Zoning and Zoning Ordinance Implementation

The proposed land uses are intended to rectify the current the present state of things that are not compliant with the old CLUP and Zoning Ordinances. Protected areas are kept free of settlements and critical facilities. Required easements and setbacks are delineated as open spaces that could serve as circulation or recreational spaces. Densities will also be kept low outside the town center to complement the agricultural uses around them. The structure plan, therefore, provides for expansion areas that accommodate relocatees from settlements that are in protected and high-risk areas.

2-40

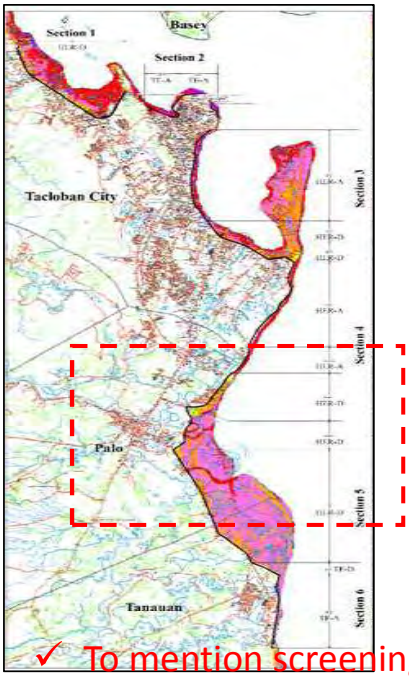
Areas of concern regarding the implementation of zoning regulations are discussed here.

2.3.2.3 Storm Surge Risk Areas

Coastal Barangays that at risk to storm surge and tsunamis should allow enough mitigation buffer zones from the coast. Buildings should be zoned to provide upper storeys for escape and evacuation.

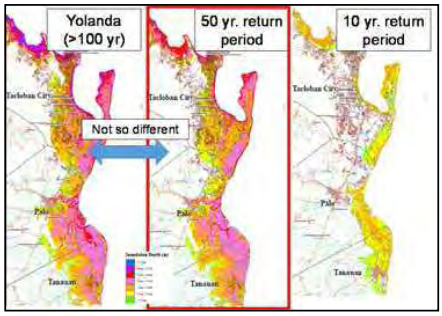
2-41

✓ To mention screening by storm surge hazard in this section



[Outline on the project]

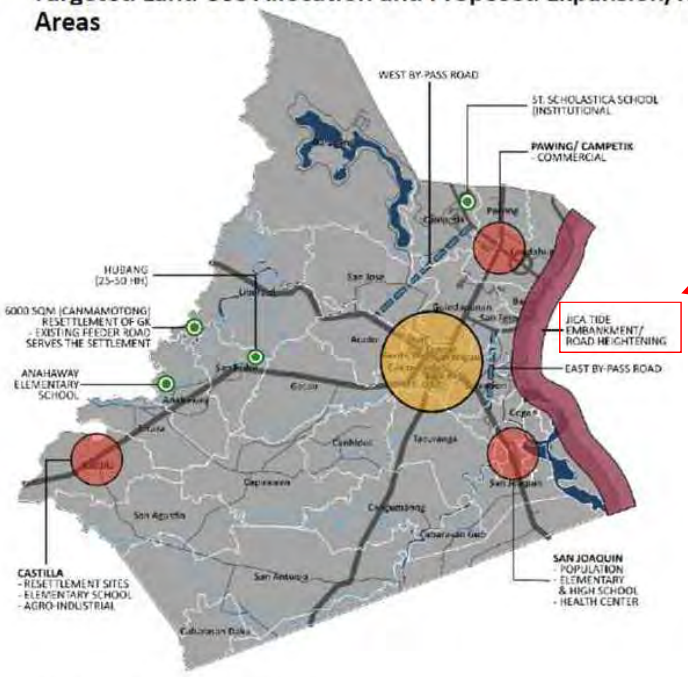
- Implementation: DPWH
- Schedule: 2016-2019
- Total Length = 27.3 km
  →This embankment will protect shoreline from Tacloban to Tanauan.
- Protection Area = 33.7 square km2
- Number of Houses/
  Buildings to be protected = 33,185
- Target hazard: 50 yrs return period of storm surge.



2-41

✓ To mention screening by storm surge hazard in this section

2.3.4 Targeted Land Use Allocation and Proposed Expansion/Recovery/Rehabilitation Areas



Change to "DPWH PROJECT"

Figure 2-14: E-CLUP Workshop Cluster 2

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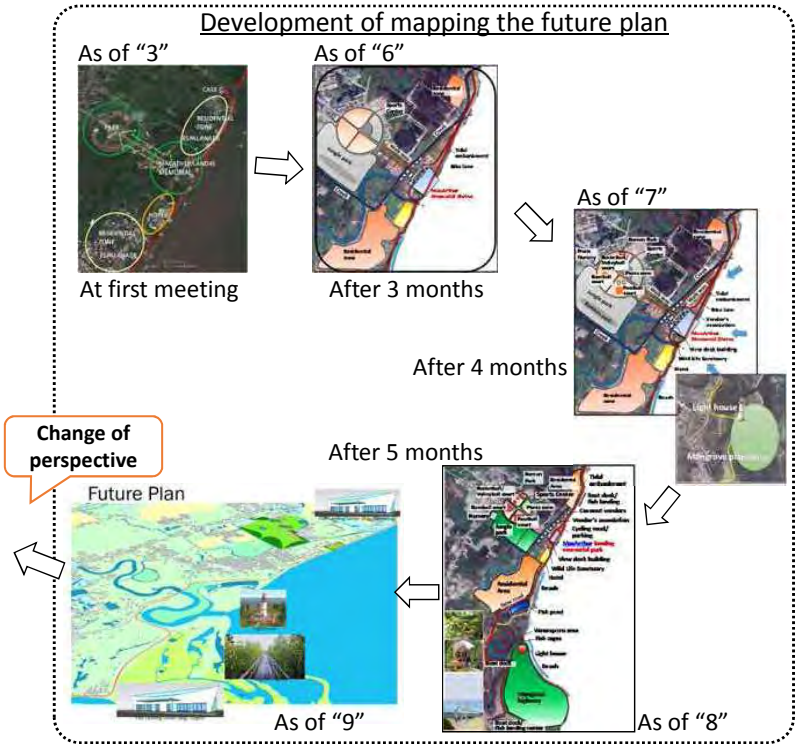
2.3.5 Proposed Concept Map and Structure Plan

2-47

✓ To mention Dream plan in this section



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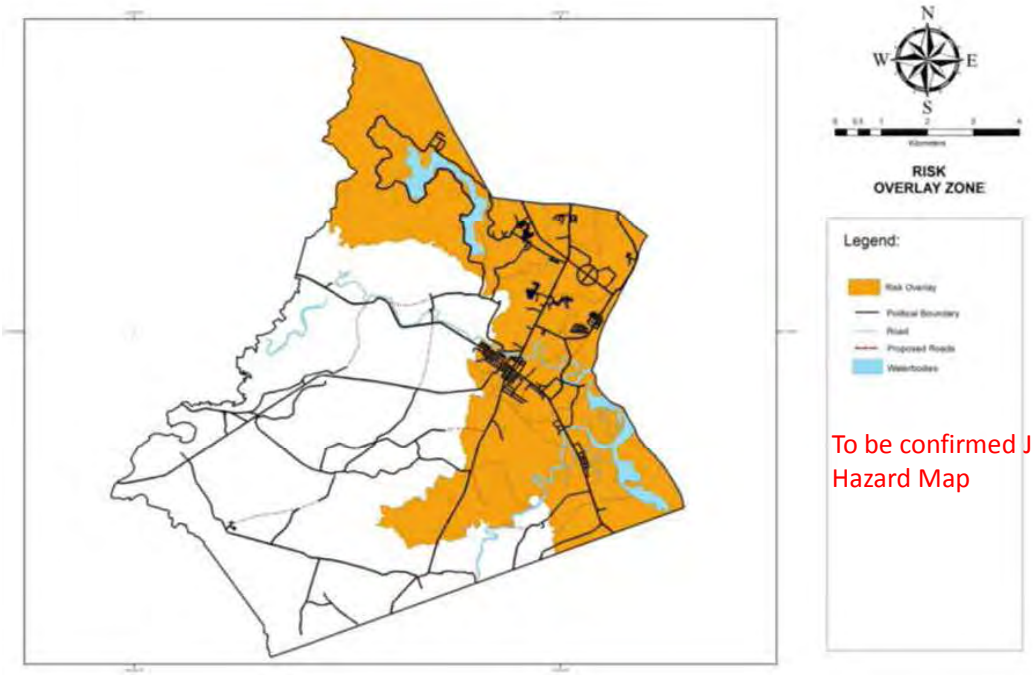
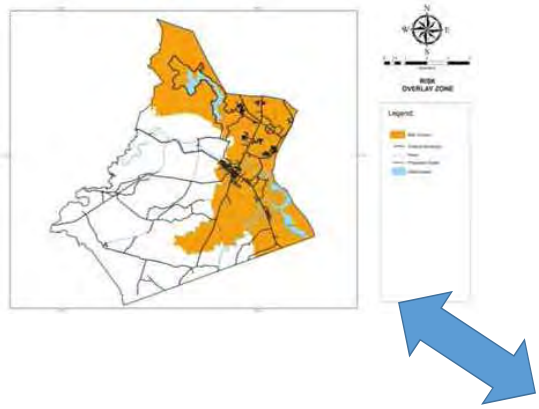
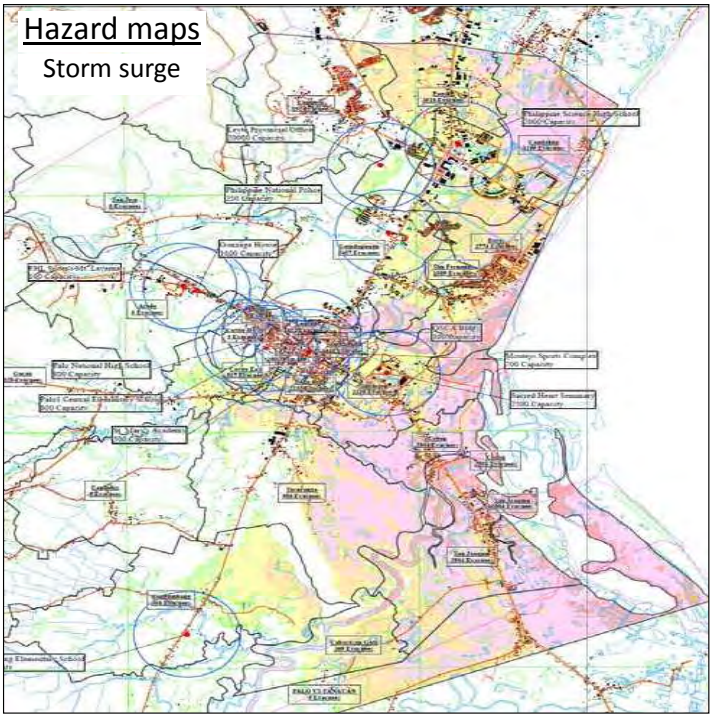


To be confirmed JICA Hazard Map

2-84

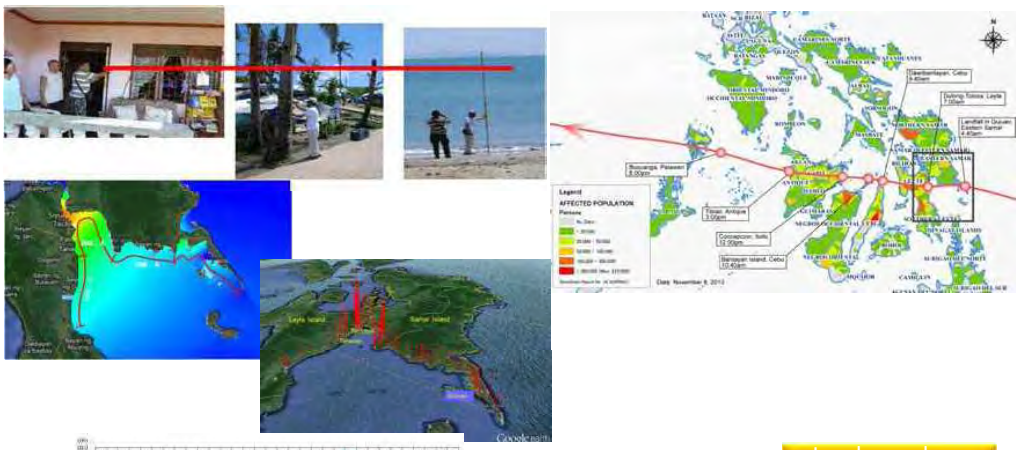


To be confirmed JICA Hazard Map

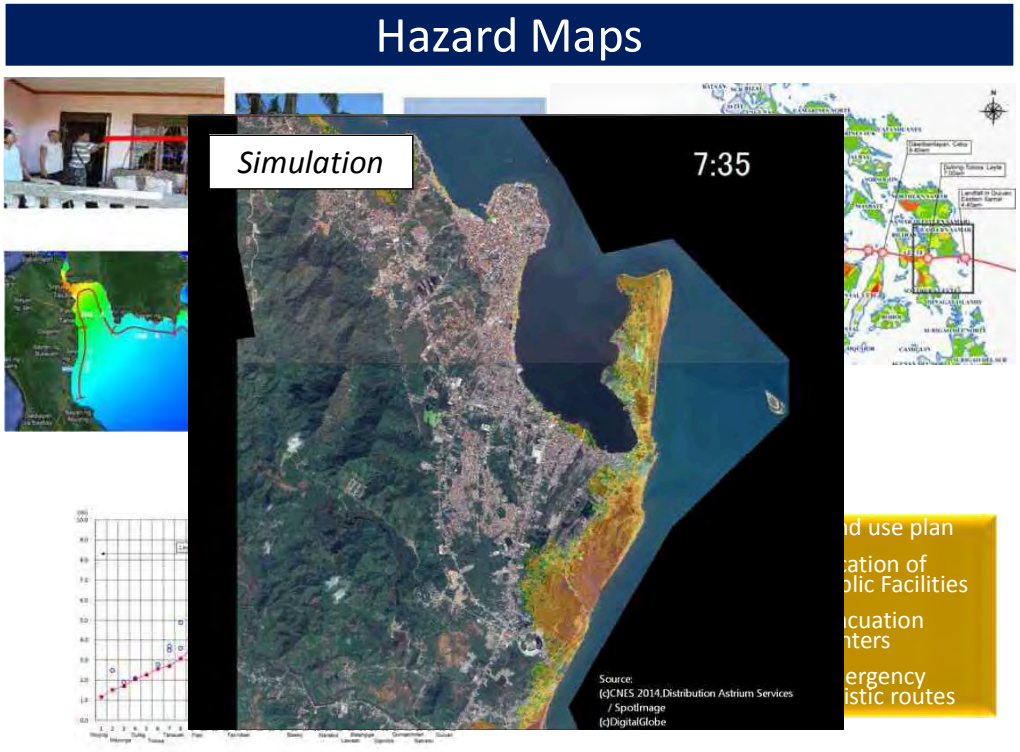


2-84

Hazard Maps



- Land use plan
- Location of Public Facilities
- Evacuation Centers
- Emergency logistic routes


Hazard Maps
Simulation
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Source:
(c)CNES 2014,Distribution Astrium Services
/ SpotImage
(c)DigitalGlobe
d use plan
cation of
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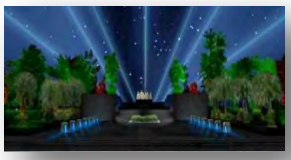
nters
ergency
istic routes

Main site	MacArthur Landing Memorial Park	**Location**	
Functions	Serves as stops for educational, tourist and recreational tour	**Image**	
	Place where people can relax		
	Center for Commerce		
Role Of Municipality	Management, Maintenance and security		
In Charge Of Design	DPWH		
Implementation Body	DPWH (1st Leyte Engineering District)		
Management Body	Province of Leyte, Municipality of Palo/ Protected Area Management Board (PAMB)		
Maintenance System	Province of Leyte and Municipality of Palo/PAMB		
Estimated Cost	60 Million php (For the whole MacArthur target area)		
Estimated Construction Term/ Implementation	240 Cal days (For the whole MacArthur target area)		
Concept	- Enhance the landscape by installing lights surrounding the park - Introduce fountains for the lights and sound presentation		

Main site	Tide Embankment with cycling road	**Location**	
Functions	Provide protection against storm surge of 50-year return period.	**Image**	
	Designate area for safe parking space for bicycles and provide opportunity for bicycle rentals for livelihood		
	Exercise area for the community and tourist		
Role Of Municipality	To be decided		
In Charge Of Design	DOT and DPWH		
Implementation Body	DPWH		
Management Body	To be decided		
Maintenance System	To be decided		
Estimated Cost	7.9 billion (Whole target area from Tacloban-Palo-Tanauan)		
Estimated Construction Term/ Implementation	Whole target area from Tacloban-Palo-Tanauan 5 years (2015-2020)		
Concept	- The structural measures which in this case is a Tide Embankment to protect properties and human lives from storm surge of 50-year return period. - Hence, the top elevation of the Tide Embankment was set based on the simulation result for the 50-year return period storm surge deviation.		

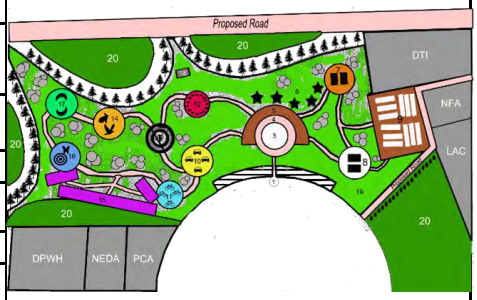
Main site	Viewing deck building	**Location**	
Functions	Center for Commerce Place where families, friends and colleague can meet Center for fine, performing and visual art	**Image**	
Role Of Municipality	Management, Maintenance and security		
In Charge Of Design	DPWH 1ST LED		
Implementation Body	DPWH 1ST LED		
Management Body	Province of Leyte, Municipality of Palo/PAMB		
Maintenance System	Municipality of Palo and Province of Leyte		
Estimated Cost	40,000,000.00 php		
Estimated Construction Term/ Implementation	240 Cal days (For the whole MacArthur target area)		
Concept	- Holding area for VIPs for special events - With commercial establishments (coffee shops and etc.)		

Main site	Vendor's area and sidewalk	**Location**	
Functions	Place where people can relax, eat, and buy souvenir shops Center for Commerce Organized area for restaurants and shops that's attractive for residents and tourist	**Image**	
Role Of Municipality	To be decided		
In Charge Of Design	Province Of Leyte and DPWH		
Implementation Body	To be decided		
Management Body	To be decided		
Maintenance System	To be decided		
Estimated Cost	Construction of 1 unit Kiosk: 160,000.00 php Streetlights: 327,000.00 php		
Estimated Construction Term/ Implementation	To be decided		
Concept	- Riverside vendors - Protection from flood waters - Provide walkway for people, serves as strolling area		

Main site	Coconuts vendor	**Location**	
Functions	Place where people can relax, eat, and buy souvenir shops	**Image**	
	Enhancing the place where people can enjoy drinking coconut		
	Organized area for shops that's attractive for residents and tourist		
Role Of Municipality	To be decided		
In Charge Of Design	Province Of Leyte		
Implementation Body	To be decided		
Management Body	To be decided		
Maintenance System	To be decided		
Estimated Cost	Construction of 1 unit Buko Stall: 4,850,000.00 php		
Estimated Construction Term/ Implementation	To be decided		
Concept	- Center for Commerce		

Main site	Sports Center	**Location**	
Functions	Center for sports in the province	**Image**	
	Open space where tourist and residents can enjoy sports in the region		
	Center for commerce		
Role Of Municipality	To be decided		
In Charge Of Design	Province Of Leyte		
Implementation Body	Province Of Leyte		
Management Body	To be decided		
Maintenance System	To be decided		
Estimated Cost	Installation of football goal: 240,000.00 Construction of Concrete Pathway: 731,516.29 Streetlights: 327,000.00		
Estimated Construction Term/ Implementation	Football field : on-going		
Concept	- Access road for people coming to the sports center to MacArthur Park - Promote interaction and recreation for residential people and tourist		

Main site	Jungle Park	**Location**	
Functions	Place to relax and enjoy nature in the urban area	**Image**	
	Value adding facility for tourist in the area		
	Center for commerce		
Role Of Municipality	To be decided		
In Charge Of Design	Province Of Leyte		
Implementation Body	Province Of Leyte		
Management Body	To be decided		
Maintenance System	To be decided		
Estimated Cost	43,470,877.76 php		
Estimated Construction Term/ Implementation	To be decided		
Concept	- Promote interaction and recreation for residential people and tourist		

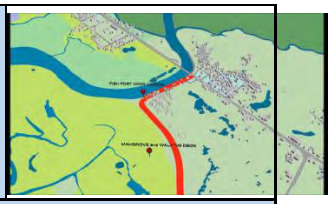


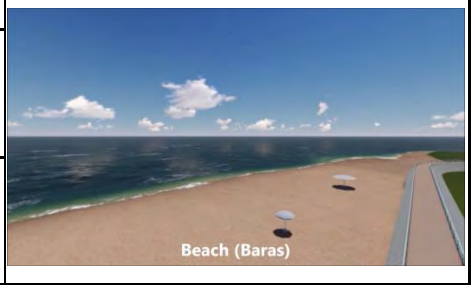
Main site	Lighthouse	**Location**	
Functions	Navigational Guide for boats	**Image**	
	Tourist site with parks for children		
	Warning system to alert residents for storm surge or tsunami		
Role Of Municipality	To be decided		
In Charge Of Design	LGU Palo		
Implementation Body	LGU Palo		
Management Body	Bantay-Dagat		
Maintenance System	Yearly		
Estimated Cost	26,557,437.00 php		
Estimated Construction Term/ Implementation	222 days		
Concept	- Provide opportunity for local residents in terms of livelihood/ Management - Observation area for tourist and residents		

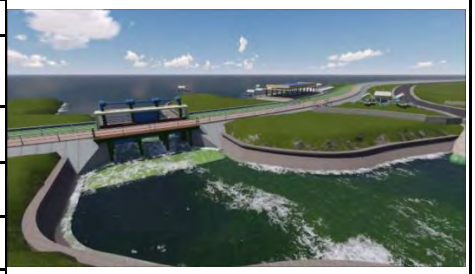
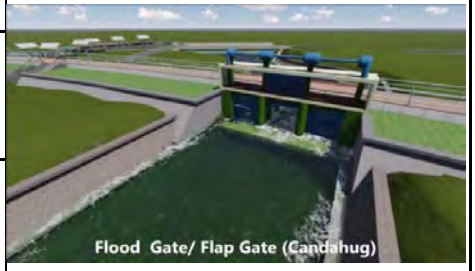
Main site	Bantay Dagat Headquarter	**Location**	
Functions	Headquarter of Bantay Dagat (Coast Patrol)	**Image**	
Role Of Municipality	Management		
In Charge Of Design	LGU Palo		
Implementation Body	Implementation : Contracted Fund: UNDP		
Management Body	Bantay Dagat Staff		
Maintenance System	LGU Palo		
Estimated Cost	500,000.00 PHP (UNDP)		
Estimated Construction Term/ Implementation	2016		
Concept	- Made of semi-lightweight materials		

Main site	Watersports Area	**Location**	
Functions	Place for Recreational Activities	**Image**	
	May hold competition for watersports		
	Place for family/friends gather and relax or compete		
Role Of Municipality	To be decided		
In Charge Of Design	To be decided		
Implementation Body	Private Sector development		
Management Body	To be decided		
Maintenance System	To be decided		
Estimated Cost	To be decided		
Estimated Construction Term/ Implementation	To be decided		
Concept	To be decided		

Main site	Mangrove Area With Walk Deck	**Location**	
Functions	Acts as breeding and nursery ground for a variety of marine animals	**Image**	
	Acts as buffer zone between the land and sea		
	Protects the land against erosion		
Role Of Municipality	DENR-PENRO Leyte; INGOs		
In Charge Of Design	LGU Palo, DENR		
Implementation Body	To be decided		
Management Body	LGU Palo, DA, DENR		
Maintenance System	DENR, LGU Palo		
Estimated Cost	LGU PALO		
Estimated Construction Term/ Implementation	To be decided		
Concept	- Plays a significant role as nature's shield against cyclones ecological disaster and protector of shorelines		

Main site	Fish landing center and boat docking (Candahug and Cogon)	**Location**	
Functions	Serve as a hub and auction of fish caught by municipal fishermen and as trading center for fish processing and value adding	**Image**	
	The facilities will, likewise, be opened as venues for skills training for disaster-resilient fisheries-based livelihoods and resource management, such as monitoring fish catch and stock assessment		
	Conservation and protection of fisheries and other undertakings that would help improve the plight of fisher folk families		
Role Of Municipality	To be decided		
In Charge Of Design	DPWH and BFAR		
Implementation Body	DPWH, BFAR		
Management Body	Fisher folk assisted by LGU and BFAR		
Maintenance System	Fisher folk assisted by LGU and BFAR		
Estimated Cost	To be decided		
Estimated Construction Term/ Implementation	To be decided		
Concept	- Serve as a hub and auction of fish caught by municipal fishermen and as trading center for fish processing and value adding		

Main site	Beach	**Location**	
Functions	Opportunity to enjoy beach Tourist destination for surfing	**Image**	
Role Of Municipality	Place for Recreational Activities		
In Charge Of Design	To be decided		
Implementation Body	To be decided		
Management Body	LGU Palo		
Maintenance System	Land Owners with LGU Palo		
Estimated Cost	None		
Estimated Construction Term/ Implementation	None; Natural Resource		
Concept	To be decided		

Main site	Flood Gate/ Flap Gate	**Location**	
Functions	Prevent storm surge going inside Preserve the natural flow of the river from the sea	**Image**	
Role Of Municipality	To be decided		
In Charge Of Design	DOT and DPWH		
Implementation Body	DPWH		
Management Body	To be decided		
Maintenance System	To be decided		
Estimated Cost	7.9 billion (Whole target area from Tacloban-Palo-Tanauan)		
Estimated Construction Term/ Implementation	Whole target area from Tacloban-Palo-Tanauan 5 years (2015-2020)		
Concept	- Waterway outlets will be provided with gates. - Side ditches will be provided alongside the tide embankment. - Back water dikes will be constructed along the banks of major rivers.		