ROLE OF GEODETIC ENGINEER ON DISASTER RISK MANAGEMENT

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OUTLINE OF THE PRESENTATION

I. INTRODUCTION AND BACKGROUND

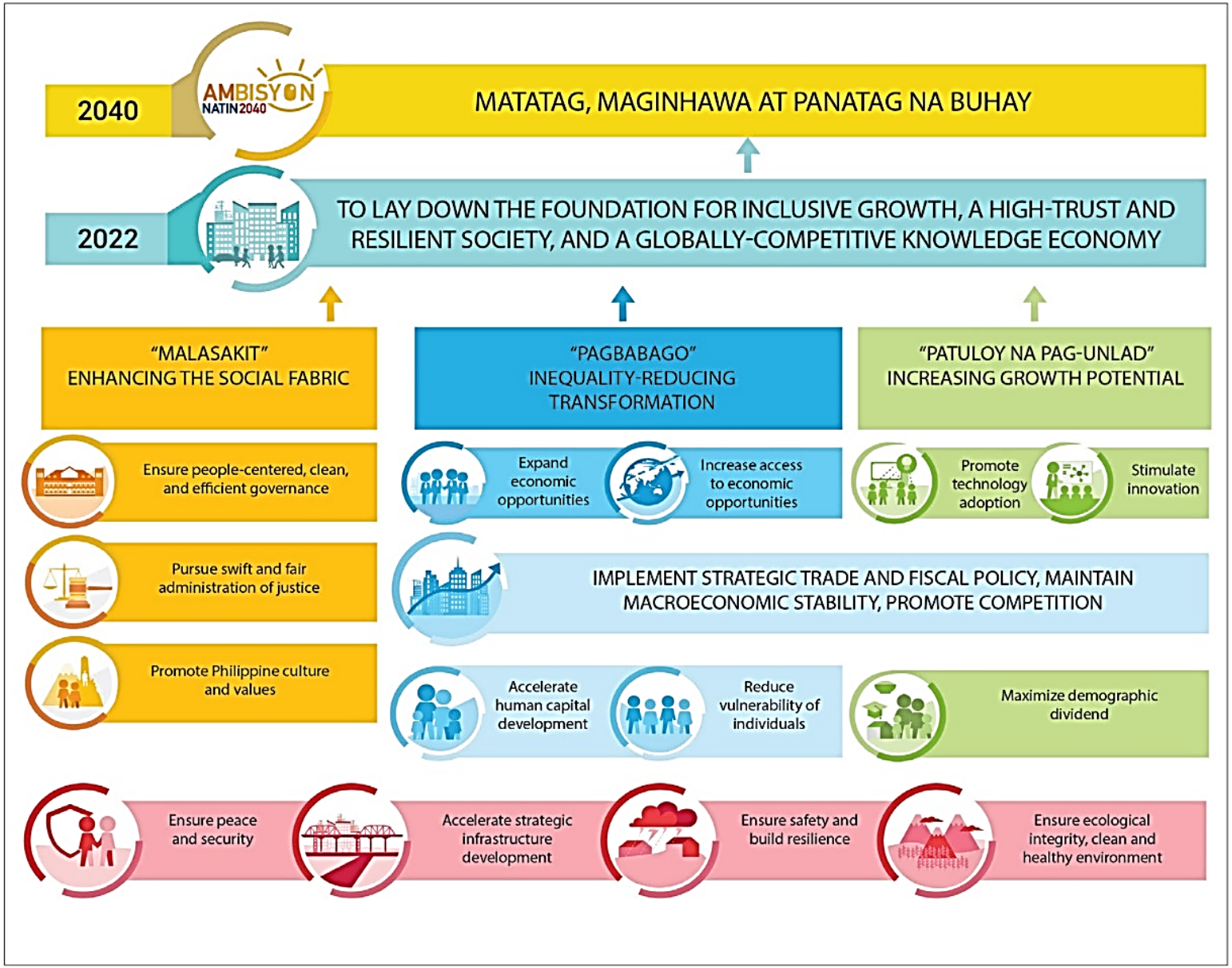
II. BUILDING DISASTER RESILIENT COMMUNITY

III. ROLE OF GE ON DRM

IV. CSFP BEST PRACTICES

INTRODUCTION AND BACKGROUND

Figure 4.2 PDP 2017-2022 Overall Strategic Framework



SENDAI FRAMEWORK FOR DISASTER RISK REDUCTION (SFDRR) 2015-2030

- Adopted on ***18 March 2015*** in Sendai, Japan by 187 UN Member States
- The **Sendai Framework** is a **15-year, voluntary, non-binding agreement** which recognizes that the **State has the primary role to reduce disaster risk but that responsibility should be shared with other stakeholders including local government, the private sector and other stakeholders**
- The Sendai Framework for Disaster Risk Reduction 2015-2030 is the **first major agreement** of the post-2015 development agenda, with seven (7) targets and four (4) priorities for action

PARIS AGREEMENT

Aims to:

- Hold the increase in global average temperature to **well below 2°C** above pre-industrial levels
- Pursue efforts to further limit temperature increase to **1.5°C**.
- **Signed by PH:**
  April 22, 2017

REPUBLIC ACT 10121 & DepEd ORDER NO. 37, S. 2015

S. No 3086
H No 6985

Republic of the Philippines
Congress of the Philippines
Metro Manila

Fourteenth Congress

Third Regular Session

Begun and held in Metro Manila, on Monday, the twenty-seventh day of July, two thousand nine.

[REPUBLIC ACT NO. 10121]

AN ACT STRENGTHENING THE PHILIPPINE DISASTER RISK REDUCTION AND MANAGEMENT SYSTEM, PROVIDING FOR THE NATIONAL DISASTER RISK REDUCTION AND MANAGEMENT FRAMEWORK AND INSTITUTIONALIZING THE NATIONAL DISASTER RISK REDUCTION AND MANAGEMENT PLAN, APPROPRIATING FUNDS THEREFOR AND FOR OTHER PURPOSES

Republic of the Philippines
Department of Education

12 AUG 2015

DepEd ORDER
No. 37 , s. 2015

THE COMPREHENSIVE DISASTER RISK REDUCTION AND MANAGEMENT (DRRM) IN EDUCATION FRAMEWORK

To: Undersecretaries
Assistant Secretaries
Bureau Directors
Directors of Services, Centers, and Heads of Units
Regional Secretary, ARMM
Regional Directors
Schools Division Superintendents
Heads, Public and Private Elementary and Secondary Schools
All Others Concerned

1. The Department of Education (DepEd) issues the enclosed **Comprehensive Disaster Risk Reduction and Management (DRRM) in Basic Education Framework** to guide DRRM efforts in the basic education sector towards resilience-building in offices and schools, and to ensure that quality education is continuously provided and prioritized even during disasters and/or emergencies.

2. This Framework shall institutionalize DRRM structures, systems, protocols and practices in DepEd offices and schools. Further, this shall provide common understanding and language in the implementation of DRRM in basic education at all levels.

3. All DepEd Orders and other related issuances, rules and regulations and provisions, which are inconsistent with these guidelines are hereby repealed, rescinded, or modified accordingly.

4. For more information, all concerned may contact the **Disaster Risk Reduction Management Office (DRRMO)**, Department of Education (DepEd) Central Office, 4th Floor, Bonifacio Building, DepEd Complex, Meralco Avenue, Pasig City, at telefax no.: (02) 637-4933 or through email address: drrmo@deped.gov.ph.

5. Immediate dissemination of and strict compliance with this Order is directed.

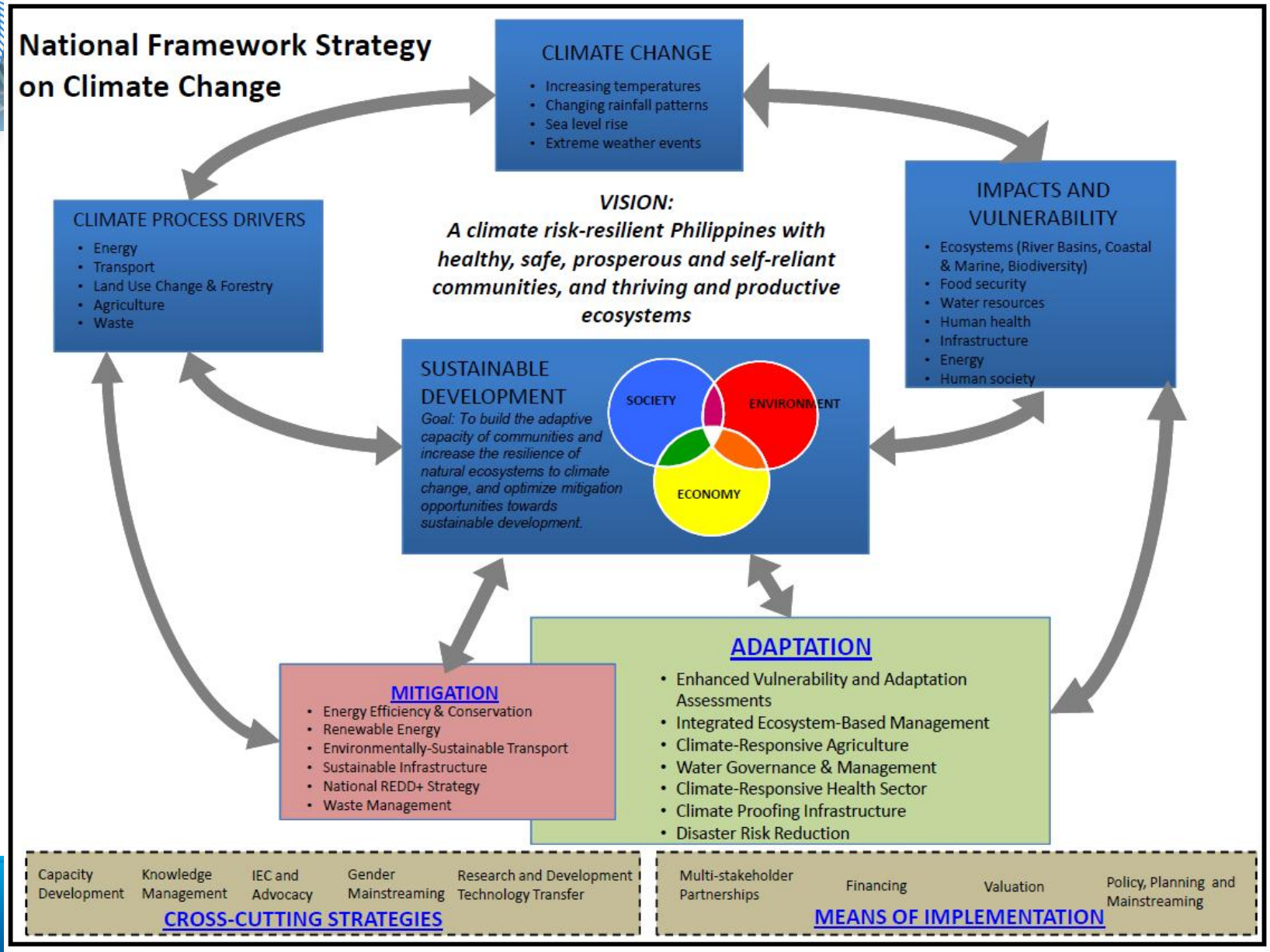
BR. ARMIN A. LUISTRO FSC
Secretary

DepEd Complex, Meralco Avenue, Pasig City 1600 633-7208/633-7228/632-1361 636-4876/637-6209 www.deped.gov.ph

INTRODUCTION AND BACKGROUND

...the State has adopted the Philippine Agenda 21 framework which espouses **sustainable development,** to fulfill human needs while maintaining the quality of the natural environment for current and future generations.

- SECTION 2 RA 9729


National Framework Strategy on Climate Change
CLIMATE CHANGE
Increasing temperatures
Changing rainfall patterns
Sea level rise
Extreme weather events
CLIMATE PROCESS DRIVERS
Energy
Transport
Land Use Change & Forestry
Agriculture
Waste
VISION:
A climate risk-resilient Philippines with healthy, safe, prosperous and self-reliant communities, and thriving and productive ecosystems
IMPACTS AND VULNERABILITY
Ecosystems (River Basins, Coastal & Marine, Biodiversity)
Food security
Water resources
Human health
Infrastructure
Energy
Human society
SUSTAINABLE DEVELOPMENT
Goal: To build the adaptive capacity of communities and increase the resilience of natural ecosystems to climate change, and optimize mitigation opportunities towards sustainable development.
SOCIETY
ENVIRONMENT
ECONOMY
MITIGATION
Energy Efficiency & Conservation
Renewable Energy
Environmentally-Sustainable Transport
Sustainable Infrastructure
National REDD+ Strategy
Waste Management
ADAPTATION
Enhanced Vulnerability and Adaptation Assessments
Integrated Ecosystem-Based Management
Climate-Responsive Agriculture
Water Governance & Management
Climate-Responsive Health Sector
Climate Proofing Infrastructure
Disaster Risk Reduction
Capacity Development
Knowledge Management
IEC and Advocacy
Gender Mainstreaming
Research and Development Technology Transfer
CROSS-CUTTING STRATEGIES
Multi-stakeholder Partnerships
Financing
Valuation
Policy, Planning and Mainstreaming
MEANS OF IMPLEMENTATION

PHILIPPINE GREEN BUILDING CODE

IFC International Finance Corporation
World Bank Group

in partnership with the Department of Public Works and Highways and the City of Mandaluyong with the support of the Canadian International Development Agency and the Swiss State Secretariat for Economic Affairs

Referral Code of the NBC; mandatory

Signed in June 2015, effective January 2016

PHILIPPINE GREEN BUILDING INITIATIVE

gr n

Measure Competitiveness in FOUR pillars

1. Economic Dynamism
2. Infrastructure
3. Government Efficiency
4. Resiliency

NATIONAL COMPETITIVE COUNCIL - PHILIPPINES

BUILDING DISASTER RESILIENT COMMUNITY

DISASTER

Disaster is a ***serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts,*** which exceeds the ability of the affected community or society to cope using its own resources.

WORLD RISK INDEX REPORT 2016

9th in 2009

6th in 2010

3rd in 2011

3rd in 2012

3rd in 2013

2nd in 2014

3rd in 2015

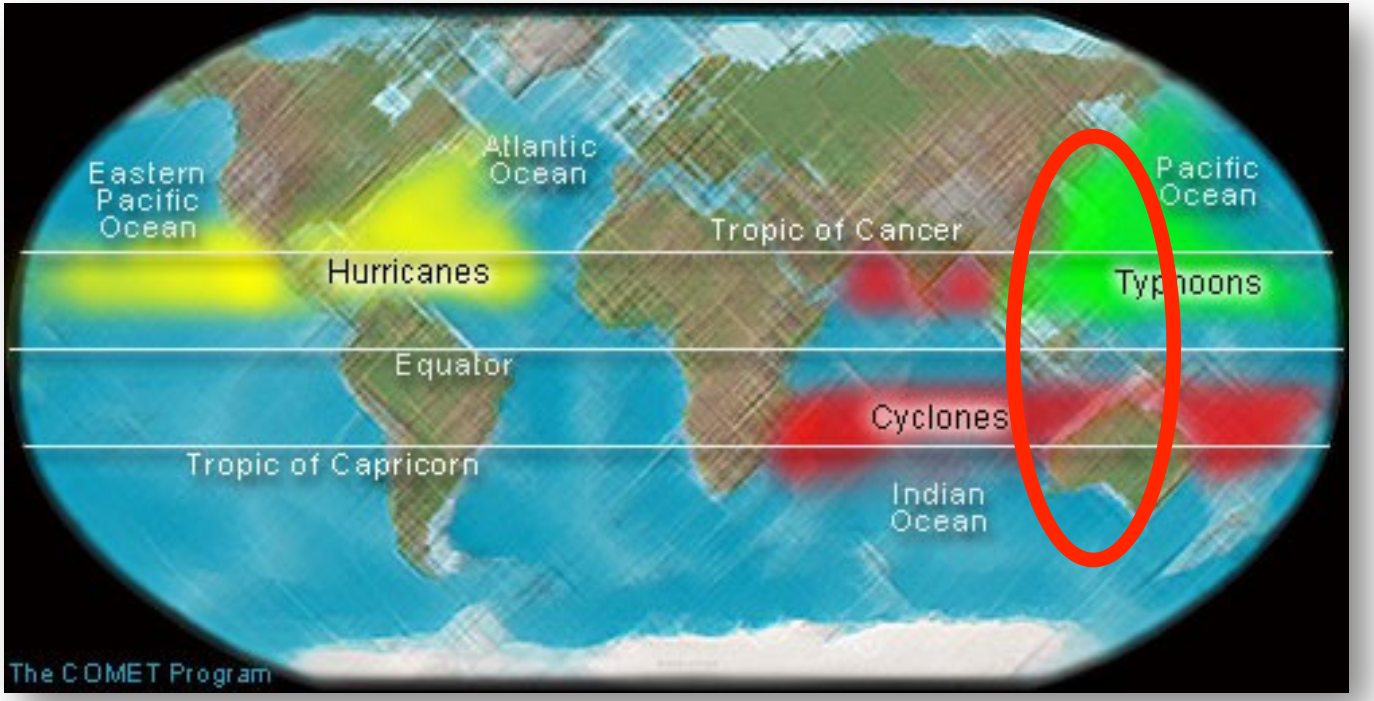
The 15 most **exposed** countries worldwide			The 15 countries that are most at **risk** worldwide		
Country	Exp. (%)	Rank	Country	Risk (%)	Rank
Vanuatu	63.66	1.	Vanuatu	36.28	1.
Tonga	55.27	2.	Tonga	[illegible]	2.
Philippines	52.46	3.	Philippines	26.70	3.
Japan	45.91	4.	Guatemala	19.88	4.
Costa Rica	42.61	5.	Bangladesh	[illegible]	5.
Brunei Darussalam	41.10	6.	Solomon Islands	19.14	6.
Mauritius	37.35	7.	Brunei Darussalam	17.00	7.
Guatemala	36.30	8.	Costa Rica	17.00	8.
El Salvador	32.60	9.	Cambodia	16.58	9.
Bangladesh	31.70	10.	Papua New Guinea	16.43	10.
Chile	30.95	11.	El Salvador	16.05	11.
Netherlands	30.57	12.	Timor-Leste	15.69	12.
Solomon Islands	29.98	13.	Mauritius	15.53	13.
Fiji	27.71	14.	Nicaragua	14.62	14.
Cambodia	27.65	15.	Guinea-Bissau	13.56	15.

3

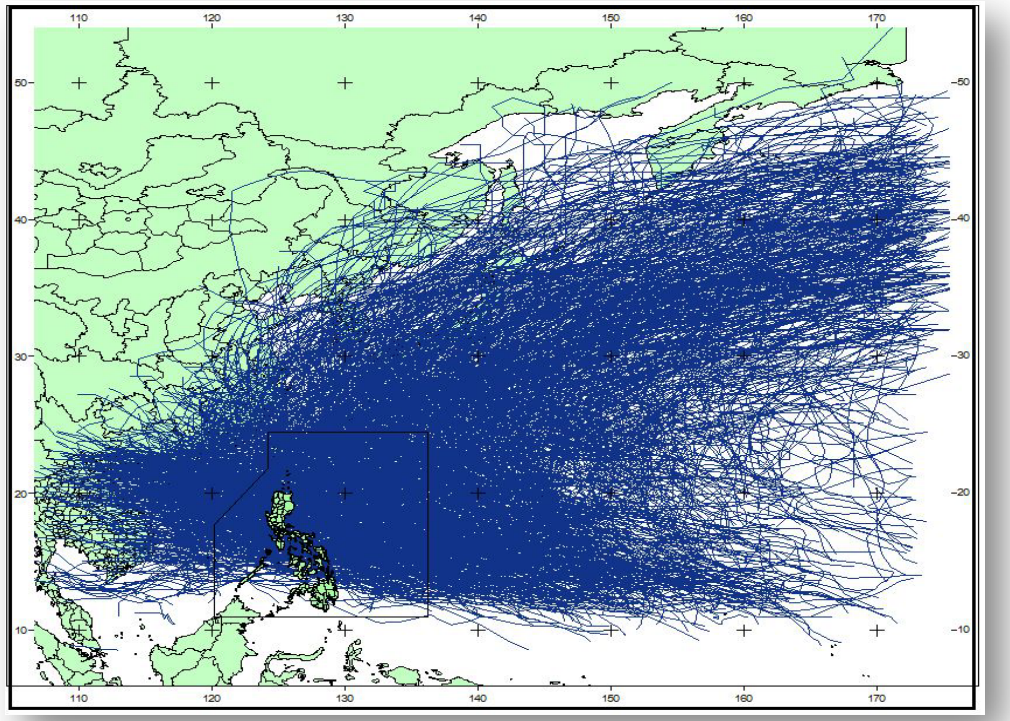
BUILDING RESILIENCY IN THE COMMUNITY

PACIFIC TYPHOON BELT

1

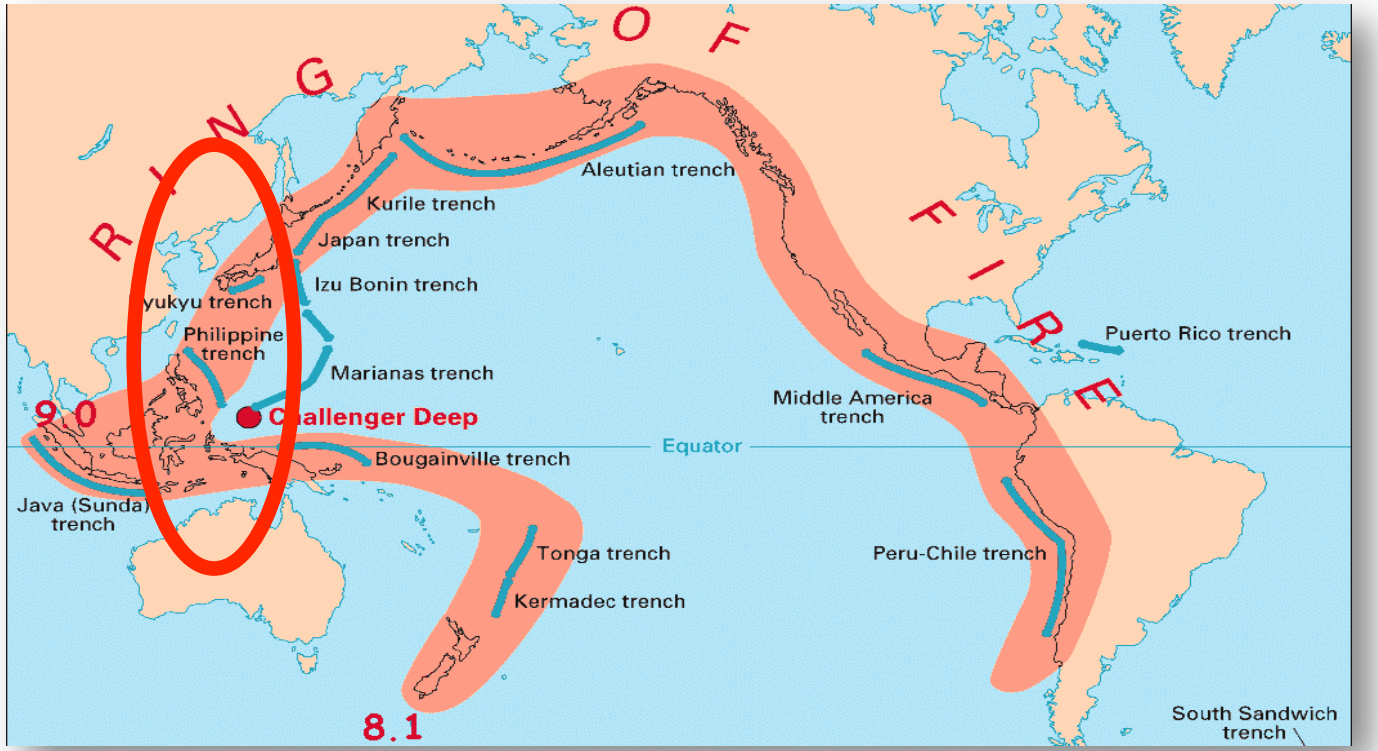


IMPORTER OF TYPHOON



Tracks of Tropical Cyclones in the Western North Pacific Period from 1948 to 2010.

PACIFIC RING OF FIRE

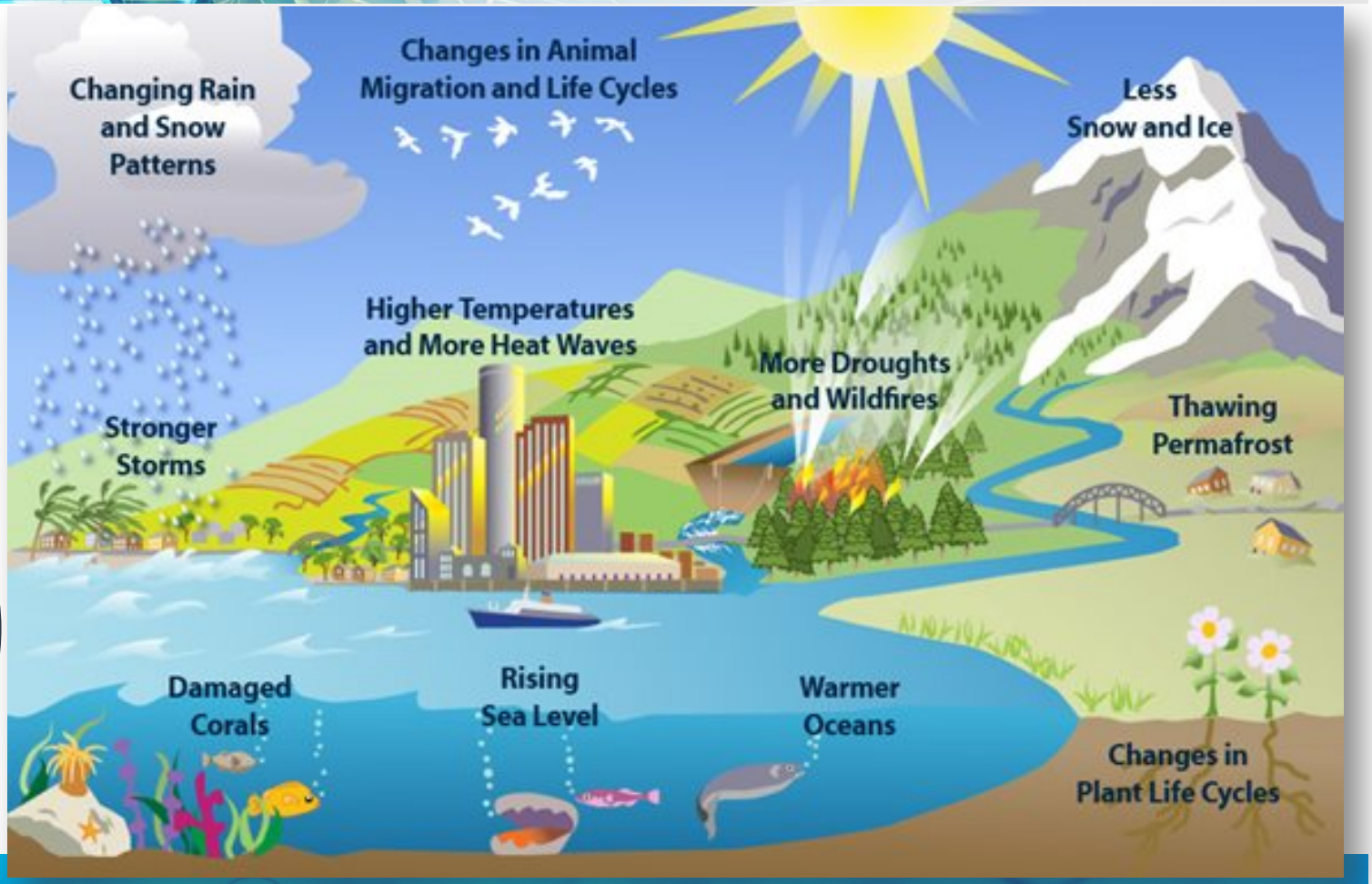


2

BUILDING RESILIENCY IN THE COMMUNITY

CLIMATE CHANGE

3



BUILDING RESILIENCY IN THE COMMUNITY

NATURAL HAZARDS

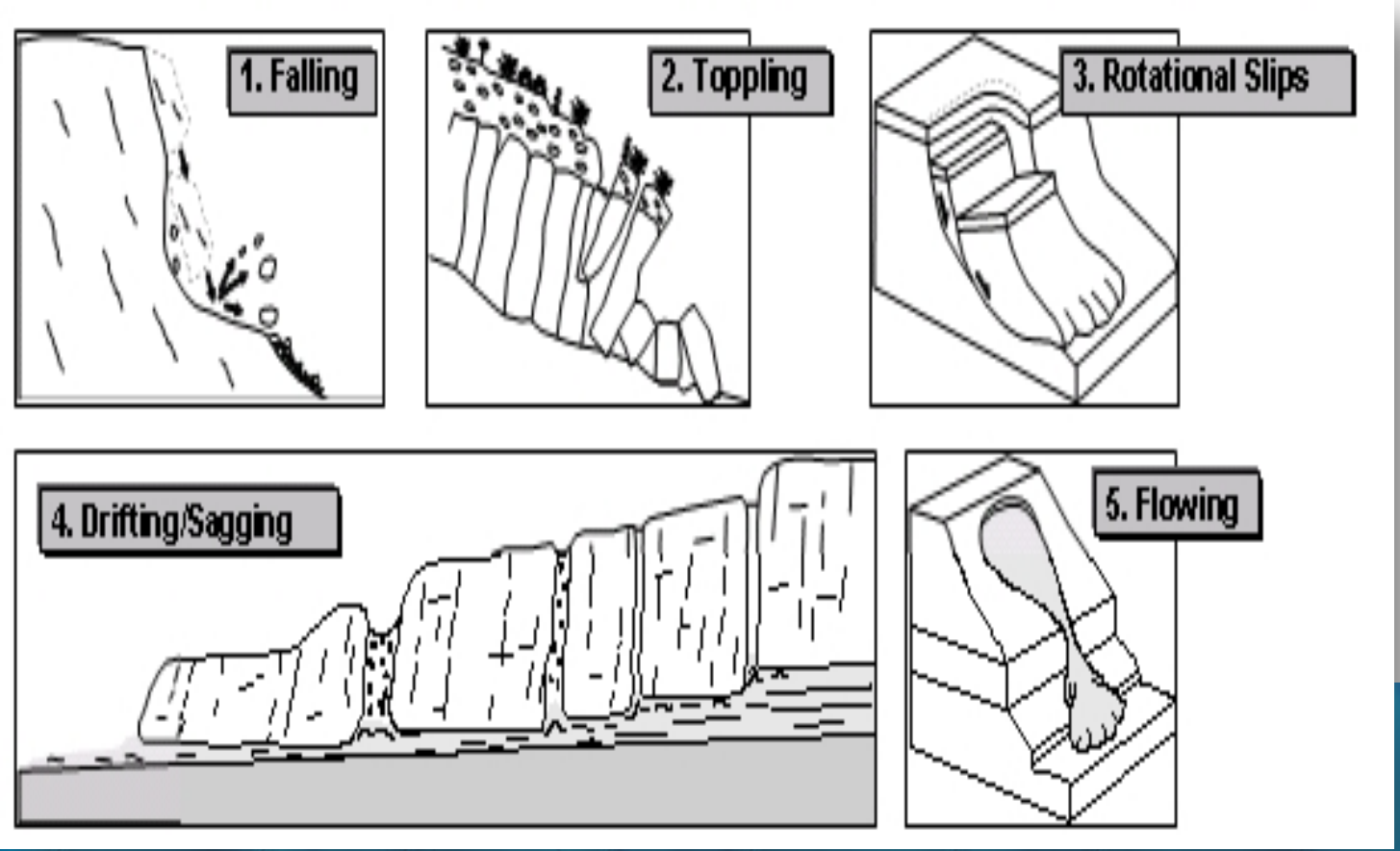
- Typhoons
- Floods
- Storm Surges
- Earthquakes
- Tsunamis
- Volcanic Eruptions
- Landslides
- Drought

LANDSLIDE

Guinsaugon Southern Leyte, 2006

CLASSIFICATION OF LANDSLIDES

According to UNESCO Working Group for World Landslide Inventory
(Source: Foppe & Schwieger, 2000)



TYPHOON

Tropical Storm Ondoy, 2009

BUILDING RESILIENCY IN THE COMMUNITY: Natural Hazards

MONSOON

Southwest Monsoon (Habagat), 2012

BUILDING RESILIENCY IN THE COMMUNITY: Natural Hazards

STORM SURGE

Typhoon Yolanda, 2013

BUILDING RESILIENCY IN THE COMMUNITY: Natural Hazards

HUMAN-INDUCED HAZARDS

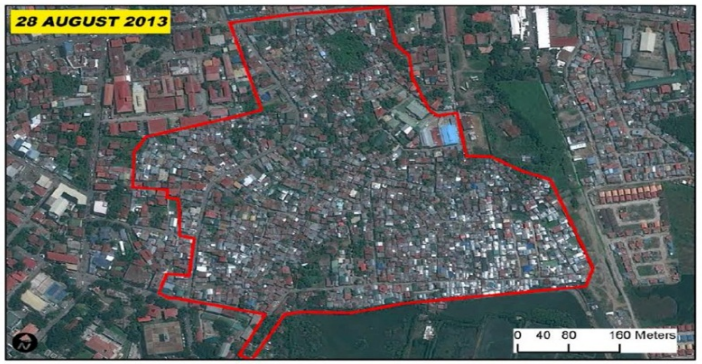
- Fire
- Maritime Accidents
- Aircraft Crash
- Land Accidents
- Industrial Accidents
- Pollution
- Civil Disturbance
- Terrorism
- Armed Conflict





TERRORISM

Zamboanga Crisis, 2013



BUILDING RESILIENCY IN THE COMMUNITY: Human-induced Hazards

TERRORISM

Battle of Marawi, 2017

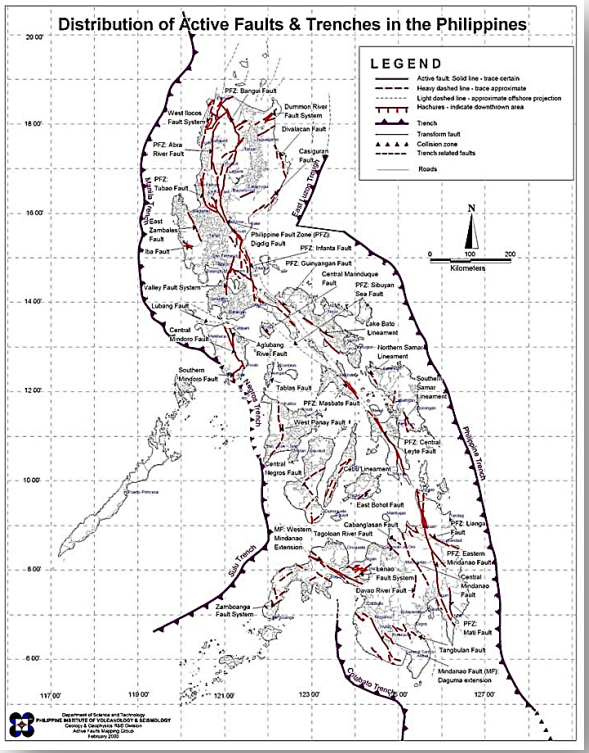
BUILDING RESILIENCY IN THE COMMUNITY: Human-induced Hazards

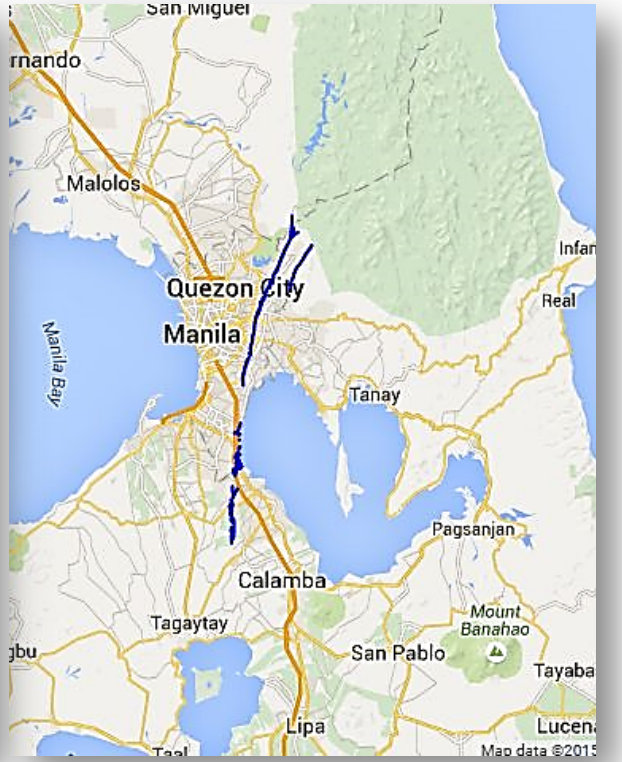
FIRE

Kentex Factory Valenzuela, 2015

BUILDING RESILIENCY IN THE COMMUNITY: Human-induced Hazards

VULNERABILITY TO EARTHQUAKE



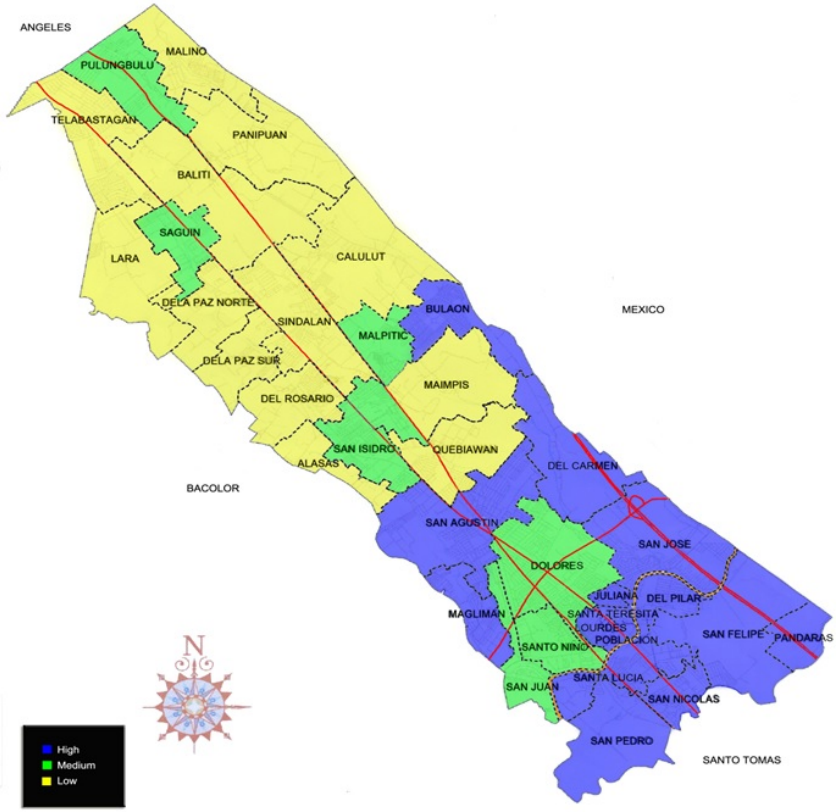


The 1,200-km-long **PHILIPPINE FAULT ZONE** (PFZ) is a major tectonic feature that is a source of large-magnitude earthquakes in recent years, Much of the earthquakes in Central Luzon come from the Iba, Zambales, WEST AND EAST VALLEY FAULT LINES.

VULNERABILITY TO LIQUEFACTION

In terms of **LIQUEFACTION**, or the softening of soil due to excess water or seismic activity, (PHIVOLCS) Director Renato Solidum Jr. cited structures near the Pampanga River and Pasig-Potrero River as most prone.

VULNERABILITY TO FLOODING



FLOOD HAZARD MAP

Natural disasters are a threat to sustainable development. The people most affected by natural disasters are the poor.

- Klaus Toepfer (UNEP)

EFFECTS OF DISASTERS

- **HUMAN TOLL**
  - Dead, injured and missing
  - Families displaced
  - Loss of livelihood
- **DAMAGES and LOSSES**
  - Productive Sectors
  - Social Sectors
  - Infrastructure
  - Cross Sectoral
- **ECONOMIC IMPACT**
  - Hampers Delivery of Services

EFFECTS OF EARTHQUAKE

Moro Gulf Tsunami

- 7.9 MAGNITUDE
- 5000 DEATHS/2000 MISSING

EFFECTS OF EARTHQUAKE

Mt. Pinatubo, 1991

- **7.8 MAGNITUDE**
- **5000 DEATHS/2000 MISSING**

EFFECTS OF EARTHQUAKE

Bohol Earthquake, 2013

- **7.2 MAGNITUDE**

BUILDING RESILIENCY IN THE COMMUNITY

EFFECTS OF EARTHQUAKE

AVOIDING EFFECTS GROUND RUPTURE

3-meter fault scarp of the North Bohol Fault in Brgy. Anonang, Inabanga

- Avoid construction of structures on top of an active fault
- House or building should be at least 5 meters away from the trace of the fault

DOST PHIVOLCS

EARTHQUAKE PREPAREDNESS

Earthquake Preparedness and Risk Reduction – Some activities

Public Help	Legislations, Building Regulations Land Use Planning
	Construction & Retrofitting Public Buildings and Infrastructure
	Emergency Shelter & Operation Disaster Information System
Mutual Help	Community (Organizational) Preparedness, Evacuation, Emergency Response Plan & Drill Information Management Business Continuity
Self Help	Individual Preparedness Family Preparedness Safer House/Building

DOST PHIVOLCS

BUILDING RESILIENCY IN THE COMMUNITY

RESILIENCE

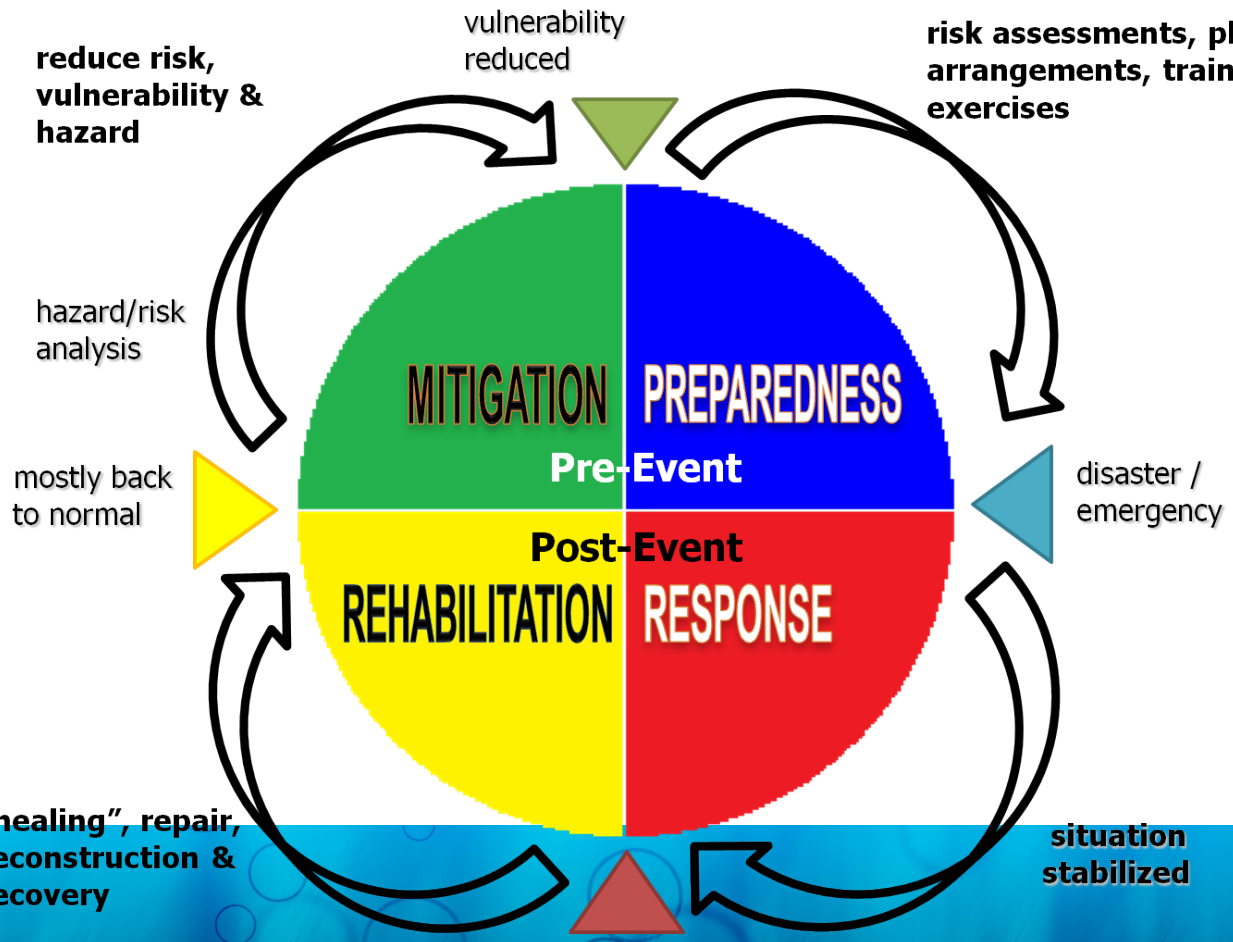
Resilience is the ability of a system, community or society exposed to hazards to resist, absorb, accommodate and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions.

BUILDING RESILIENCY IN THE COMMUNITY

REPUBLIC ACT 10121

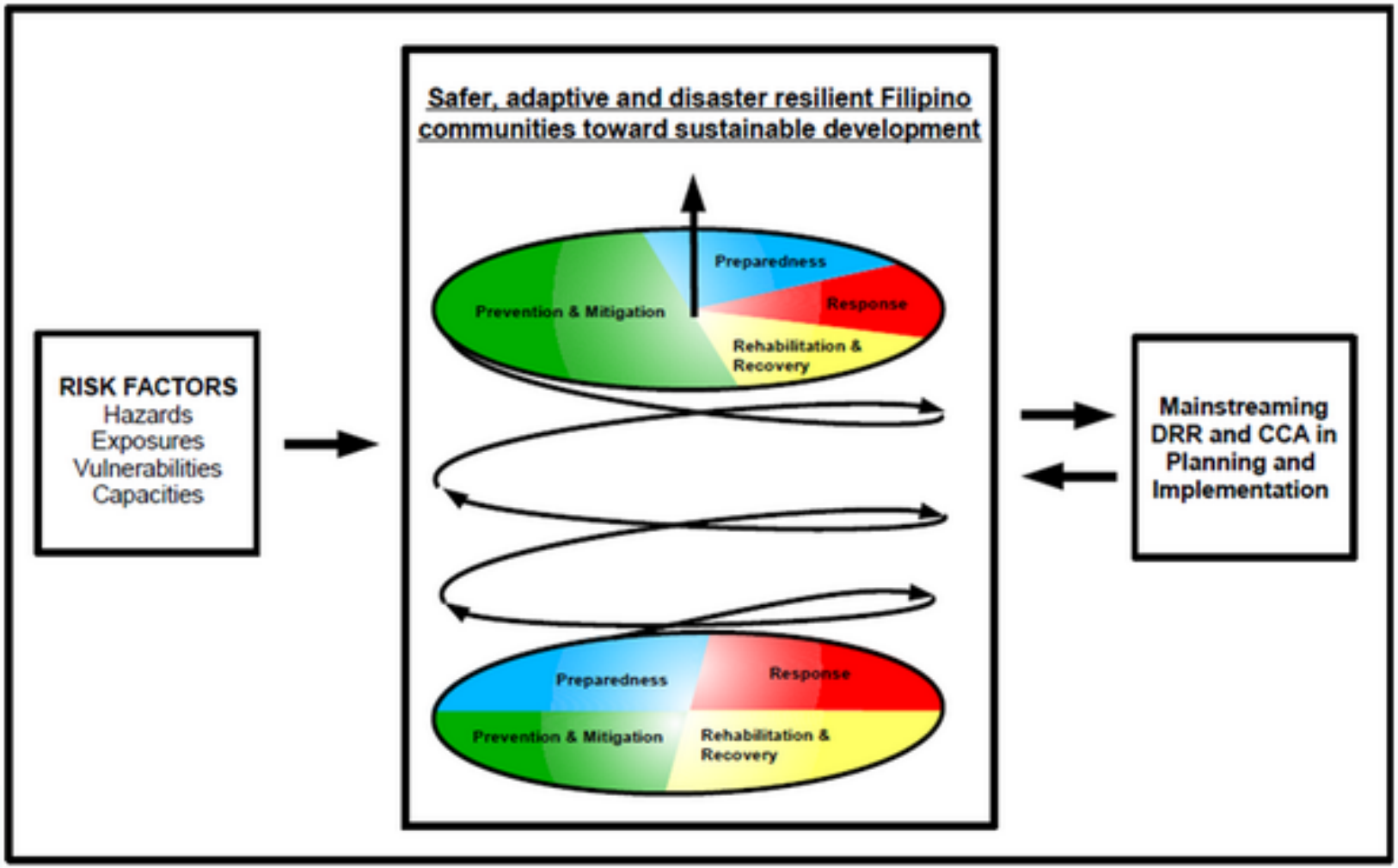
THEN	NOW
TOP-DOWN CENTRALIZED DISASTER MANAGEMENT	BOTTOM-UP PARTICIPATORY DISASTER RISK REDUCTION AND MANAGEMENT
DISASTERS AS FUNCTION OF PHYSICAL HAZARDS	DISASTERS AS REFLECTION OF PEOPLE'S VULNERABILITY
FOCUS ON DISASTER RESPONSE	INTEGRATED APPROACH TO REDUCE DISASTER RISK

DISASTER MANAGEMENT CYCLE

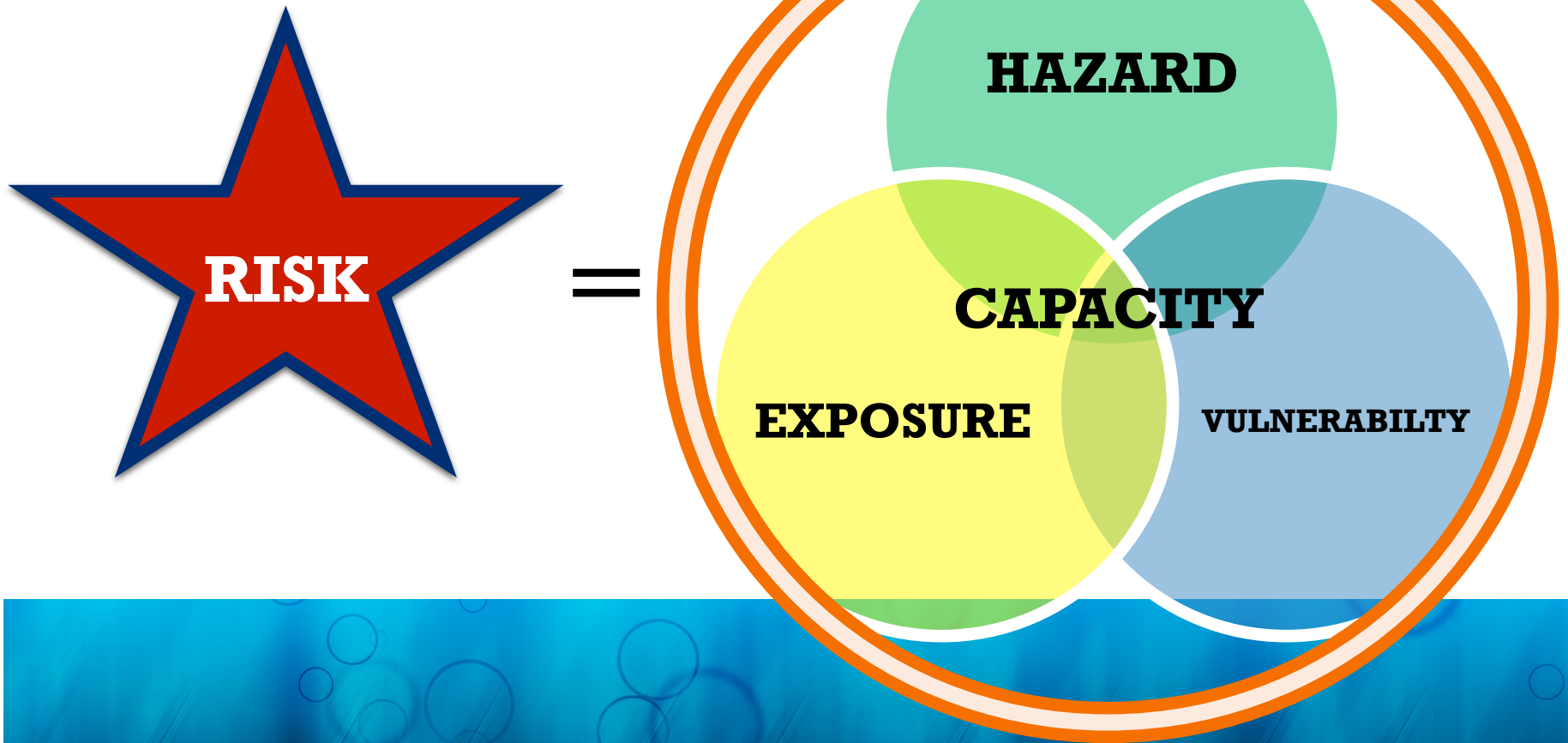


BUILDING RESILIENCY IN THE COMMUNITY

National Disaster Risk Reduction and Management Framework



DISASTER RISK EQUATION



BUILDING RESILIENCY IN THE COMMUNITY

DISASTER RISK EQUATION

To understand that disasters are "not natural", it is important to consider the ***elements of risk***:

- **RISK** is a function of the **HAZARD** (a cyclone, an earthquake, a flood, or a fire, for example);
- **EXPOSURE** of people and assets to the hazard and
- **VULNERABILITY** of the exposed population or assets.

DISASTER RISK EQUATION

These factors are not static and can be improved, depending on the institutional and individual **CAPACITY TO COPE** and/or act to reduce risk.

- ***Societal and environmental development patterns*** **can** ***increase exposure and vulnerability*** **and therefore** ***INCREASE RISK.***

DISASTER RISK EQUATION

- **We cannot ultimately control the natural hazards.**

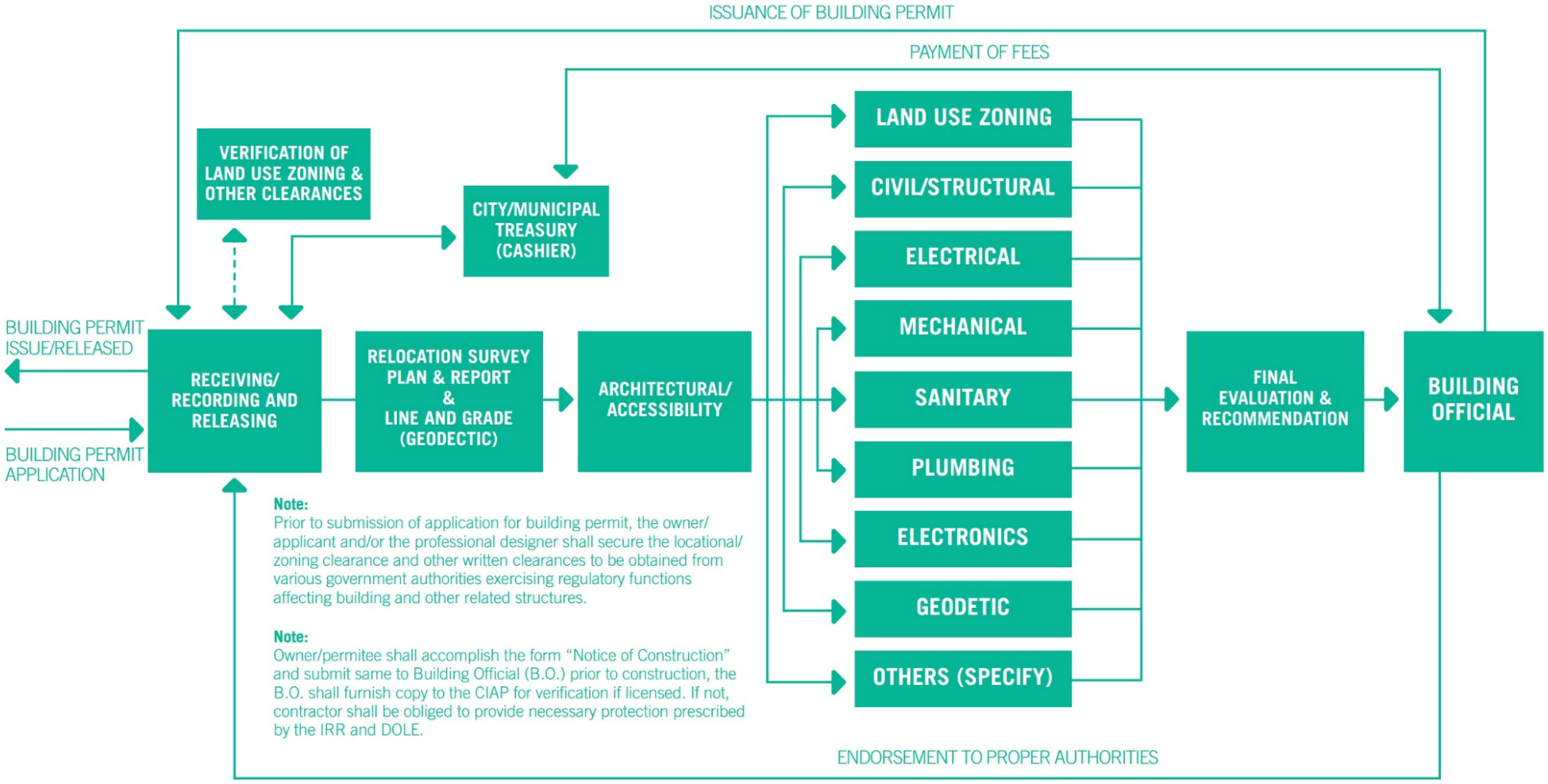
- **However, by increasing CAPACITIES, we can address the underlying factors causing the vulnerabilities and exposures so that the disaster risks can be reduced.**

ROLE OF GE ON DRM

About 80 % of daily decisions on national or local level, either in economy, finances / taxation, demography, spatial planning, environment, hazard areas, infrastructure, housing, cultural heritage, etc. **are spatially or geo-referenced**.

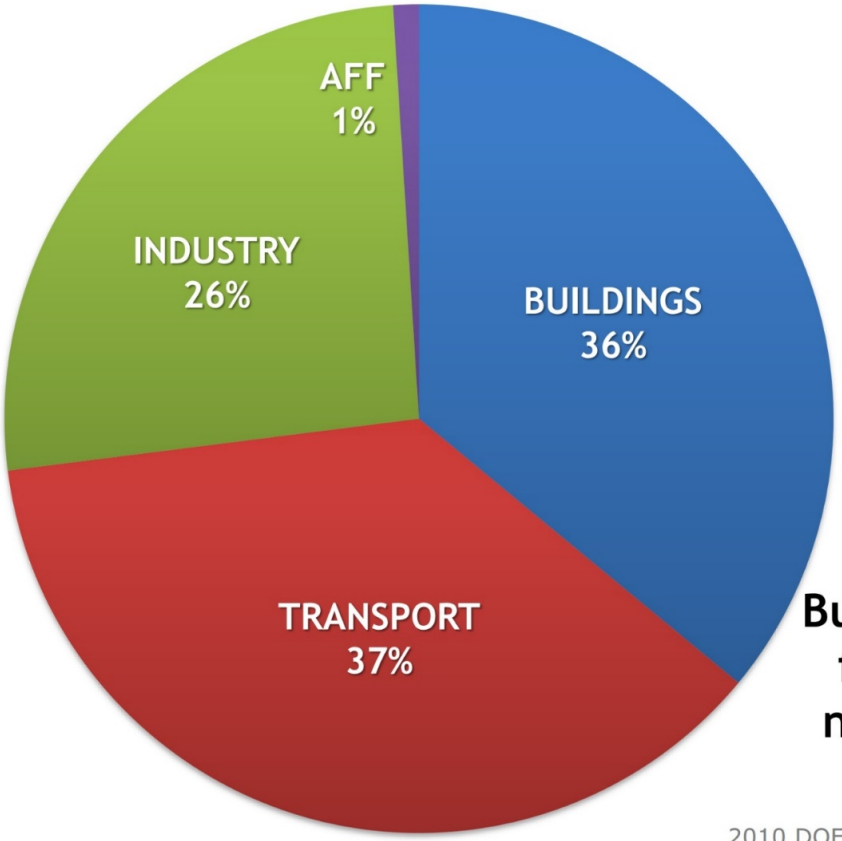
That demonstrates clearly, **Surveying** is a central pillar of each country and its economy (Magel 2005).

PROCESSING OF APPLICATION OF BUILDING PERMIT FLOW CHART



SITUATIONER

2010 ENERGY CONSUMPTION BY SECTOR



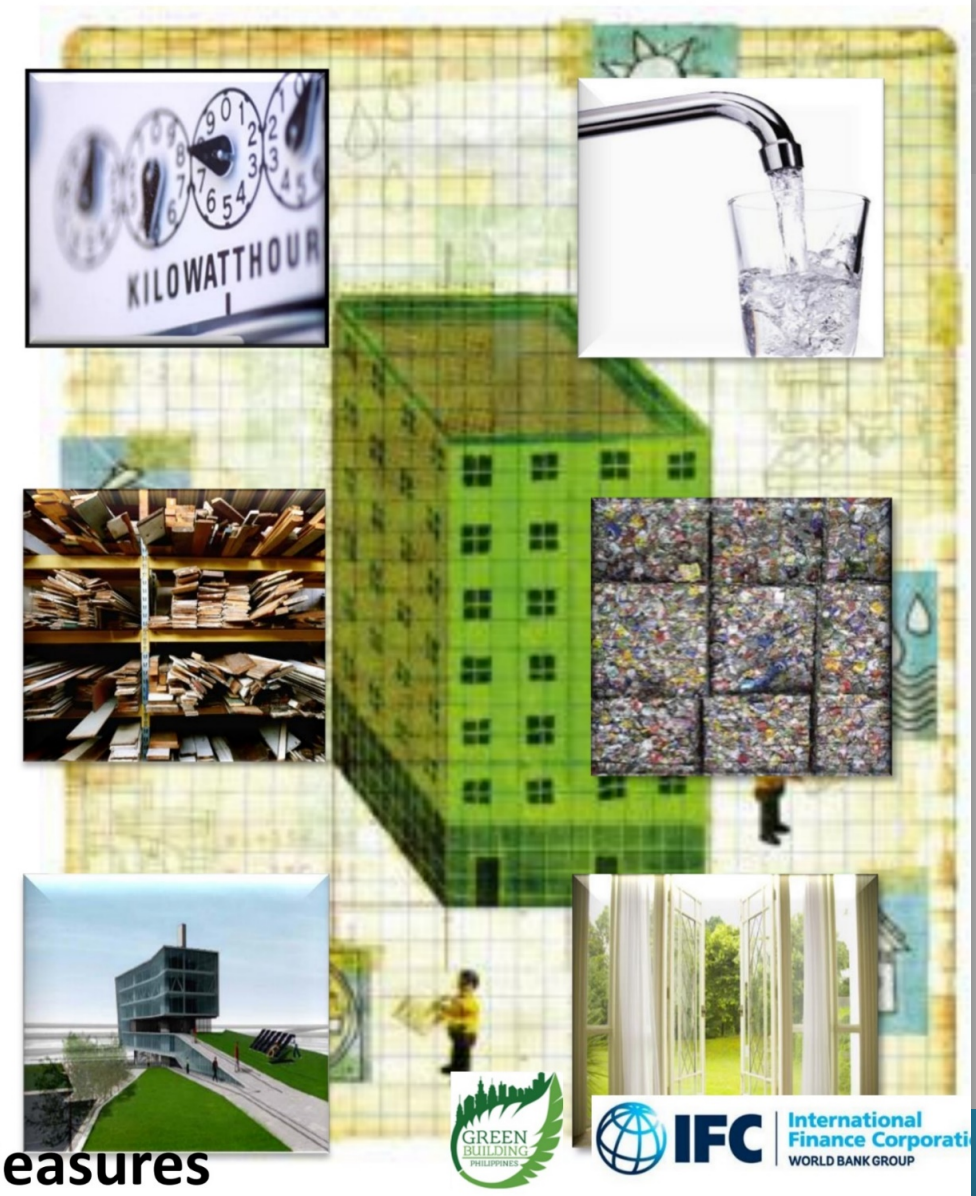
Buildings account for 36% of the national energy consumption

2010 DOE Key Energy Statistics Philippines

Energy Use Profile in the Philippines

- Energy Efficiency 16
- Water Efficiency 3
- Material Sustainability 1
- Solid Waste Management 1
- Site Sustainability 2
- Indoor Environmental Quality 2

25 GB Measures



SITE SUSTAINABILITY

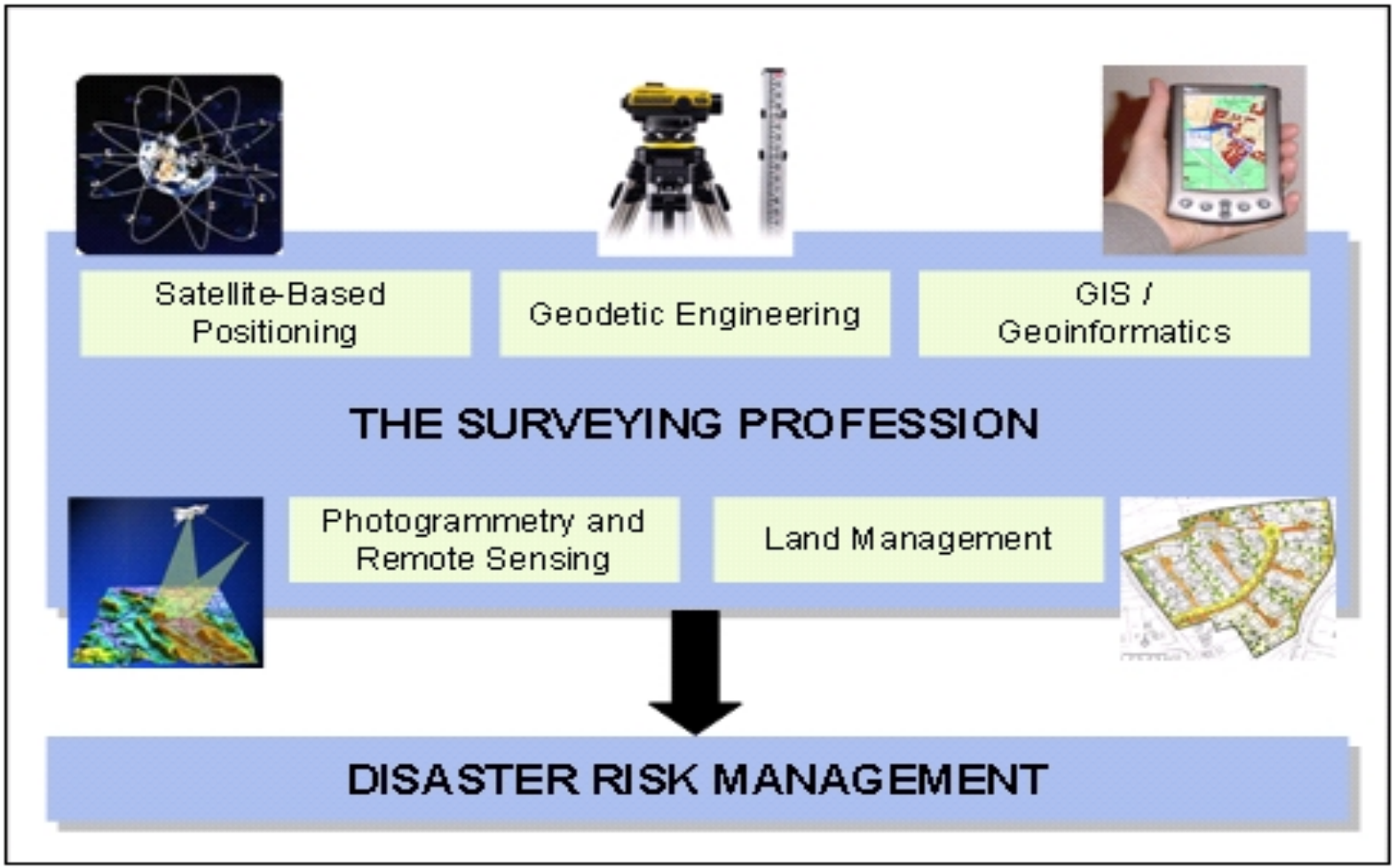
SITE PREPARATION & EARTHWORKS

Reducing impact of construction activities due to erosion and sedimentation

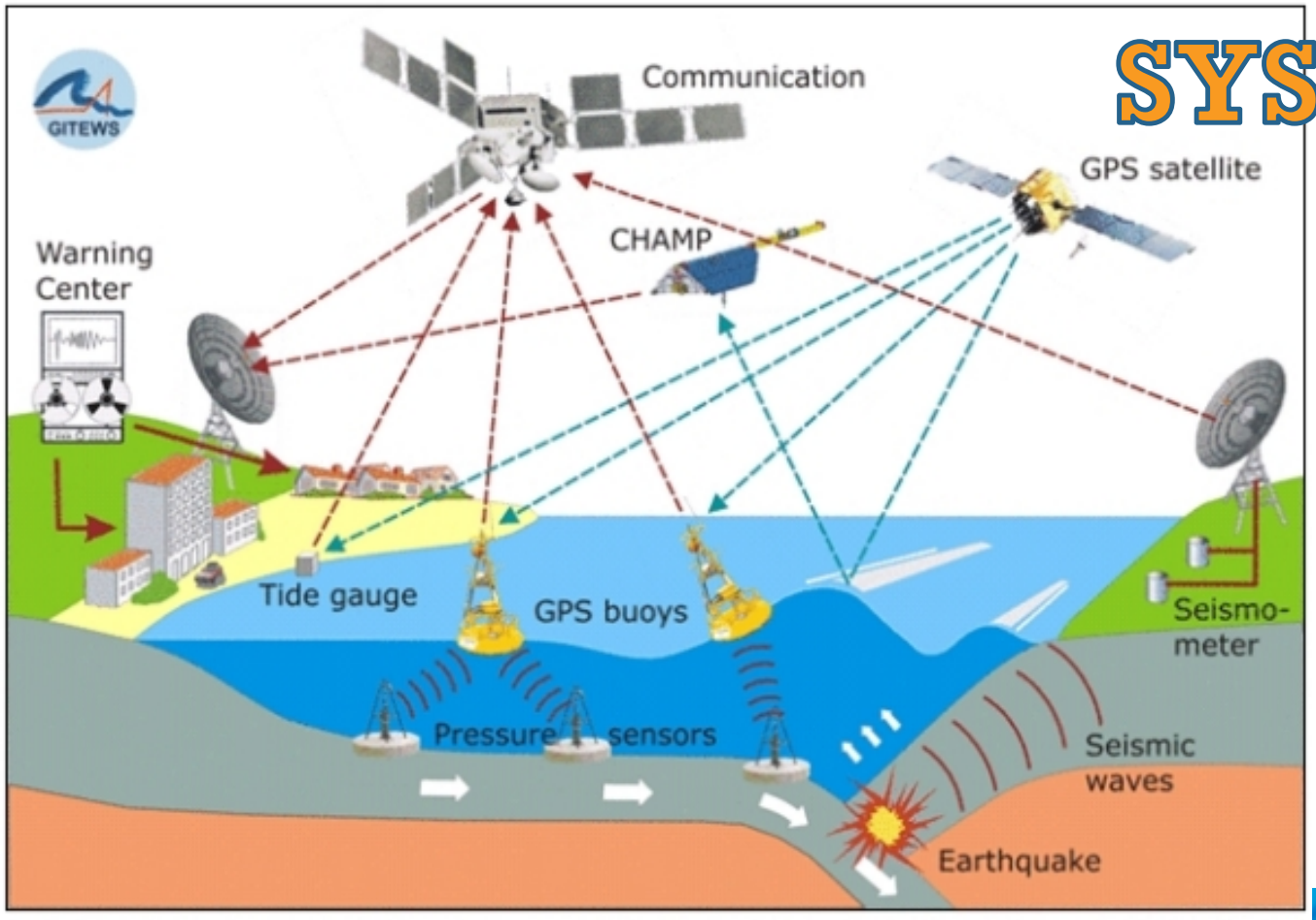
OPEN SPACE UTILIZATION

Providing green and permeable areas to help the re-charging of ground water reservoir, control of storm water surface run-off and cooler Building outside environment

THE NEED OF SURVEYING METHODS FOR DRRM



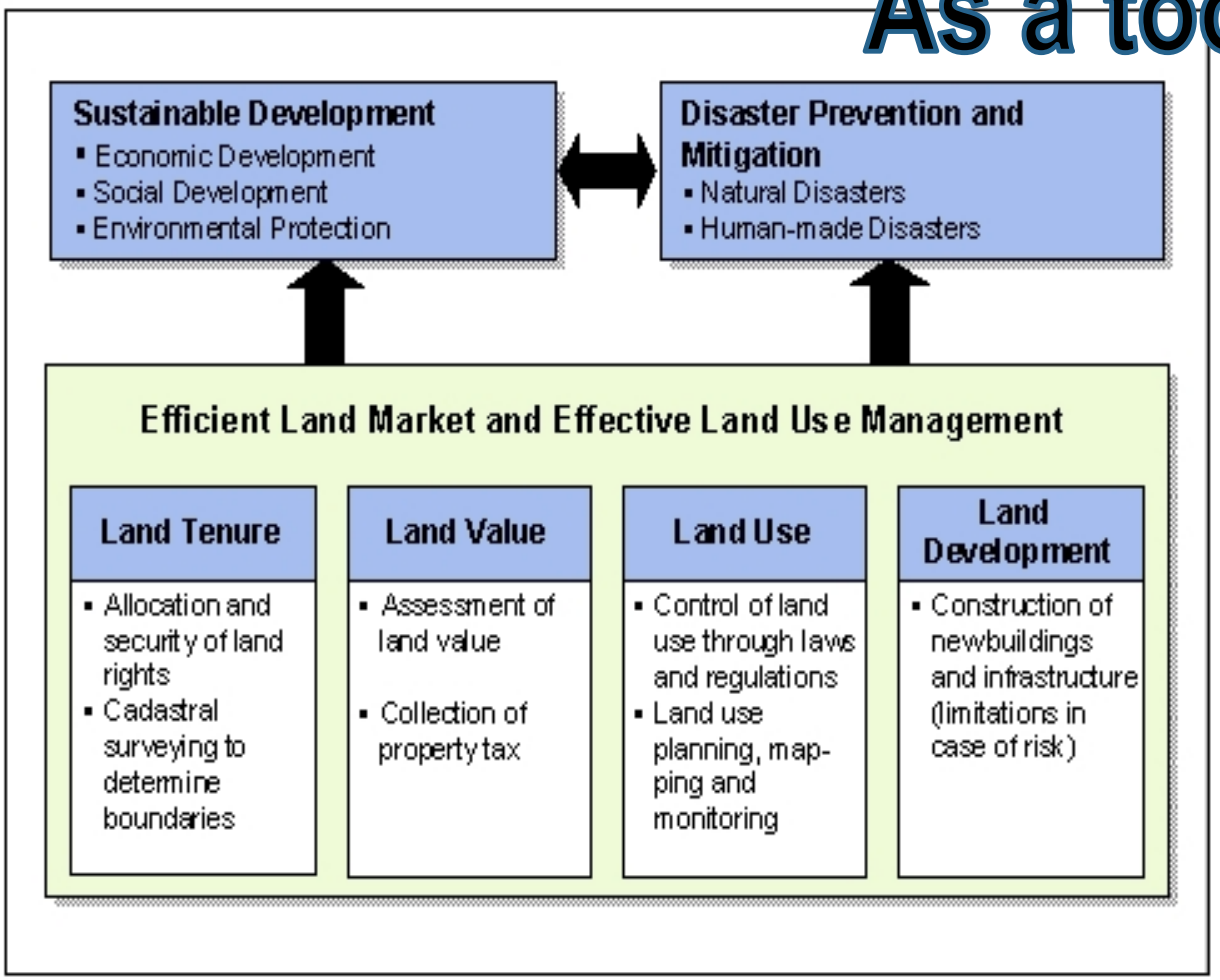
INDIAN OCEAN TSUNAMI WARNING SYSTEM



(Source: GFZ 2006)

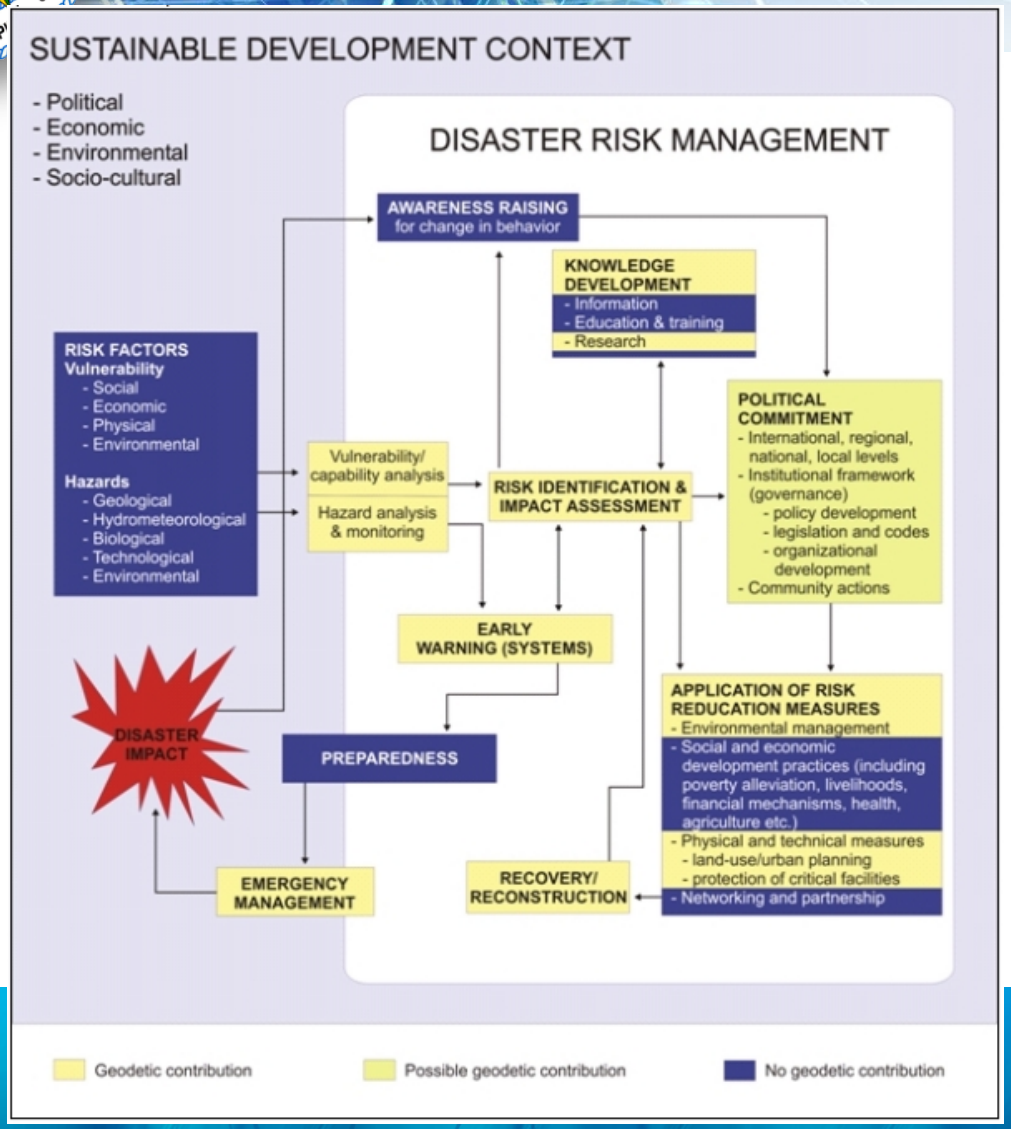
SUSTAINABLE LAND USE MANAGEMENT

As a tool for DRRM



Fields of action for preventative flood management by land consolidation

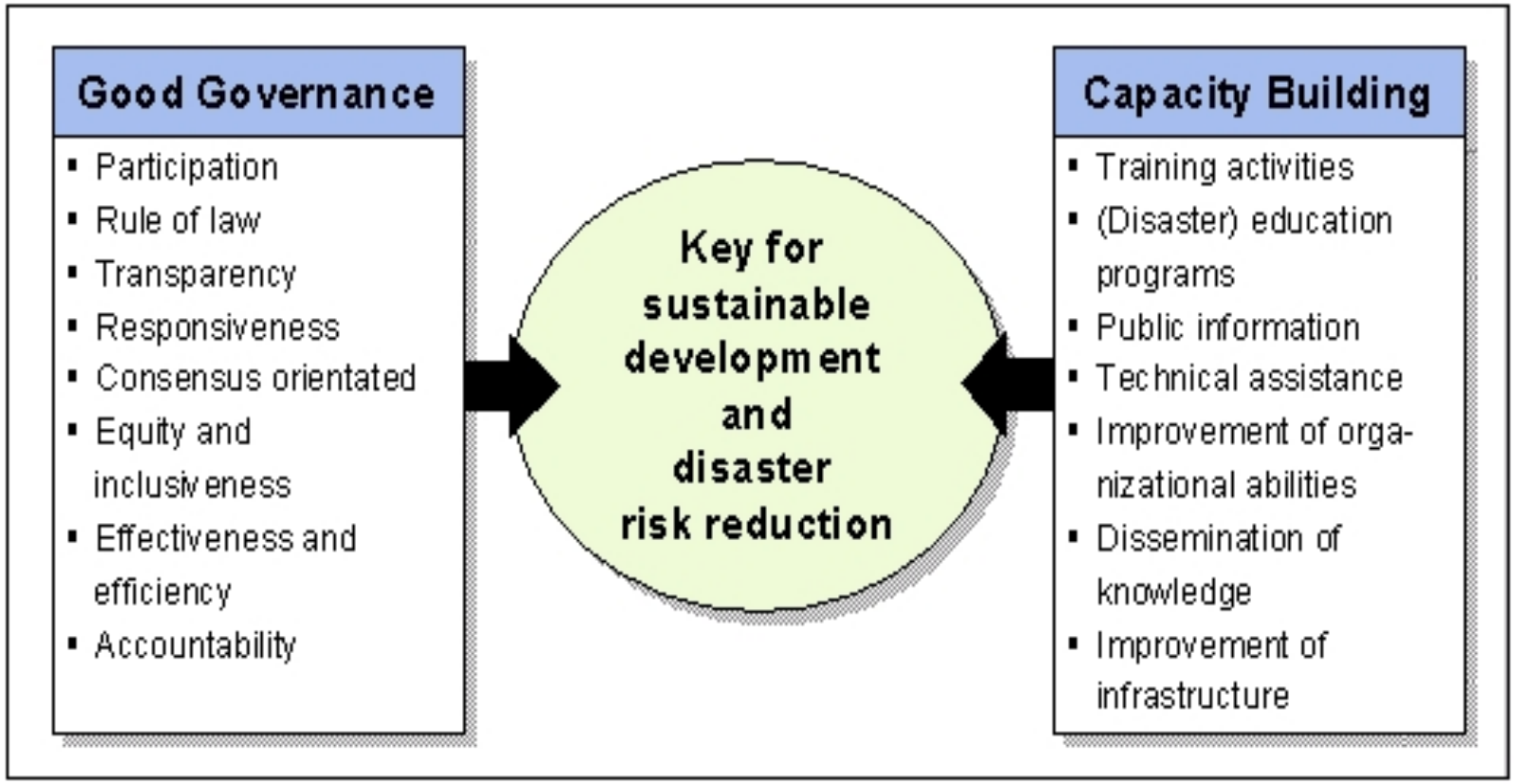
Land Consolidation as a Tool of Flood Risk Prevention
Increase of water storage capacity
Relocation of dikes
Redevelopment of flood plains
Renaturalization of rivers, restoration of small streams
Restriction or limitation of sealed surfaces
Change of land utilization
Restoration and creation of additional retention area to cause a diminution of the high water levels



(Possible) geodetic contribution to disaster risk management

Source: UN/ISDR 2004, p. 15 (modified and supplemented)

GOVERNANCE AND CAPACITY BUILDING FOR RISK REDUCTION



SHARED BEST PRACTICES

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THE PHILIPPINE STAR

TRUTH SHALL PREVAIL

VOL. XXXII NO. 50 • FRIDAY, SEPTEMBER 15, 2017 • 10 SECTIONS, 72 PAGES ₱20 MM

Manila among world's most stressful cities – study

By PIA LEE-BRAGO

Manila is among the top 10 most stressful cities in the world, according to a recent study.

In the study conducted by United Kingdom-based dry cleaning and laundry service Zipjet, Manila ranked 10th, garnering a score of 8.92 out of 10, with 10 being the most stressful.

The study analyzed 500 locations worldwide based on these factors: pollution, traffic levels, public transport, percentage of green spaces, financial status of citizens including debt levels, physical and mental health and the hours of sunlight the city gets per year.

The top 10 most stressful cities are Baghdad, Iraq; Kabul, Afghanistan; Lagos, Nigeria; Dakar, Senegal; Cairo, Egypt; Tehran,

Turn to Page 8

Manila From Page 1

Iran; Dhaka, Bangladesh; Karachi, Pakistan; New Delhi, India and Manila.

"A low score indicates a low level of stress, with each increasing number indicating a higher level of stress," Zipjet said. As such, getting a score of 1 represents the least amount of stress, and 10, the most amount of stress.

After factoring in all 17 categories, Germany's Stuttgart emerged as the least stressful city, with a total score of 1.

Germany dominated the 10 least stressful cities with four cities, three of which placed in the top 5.

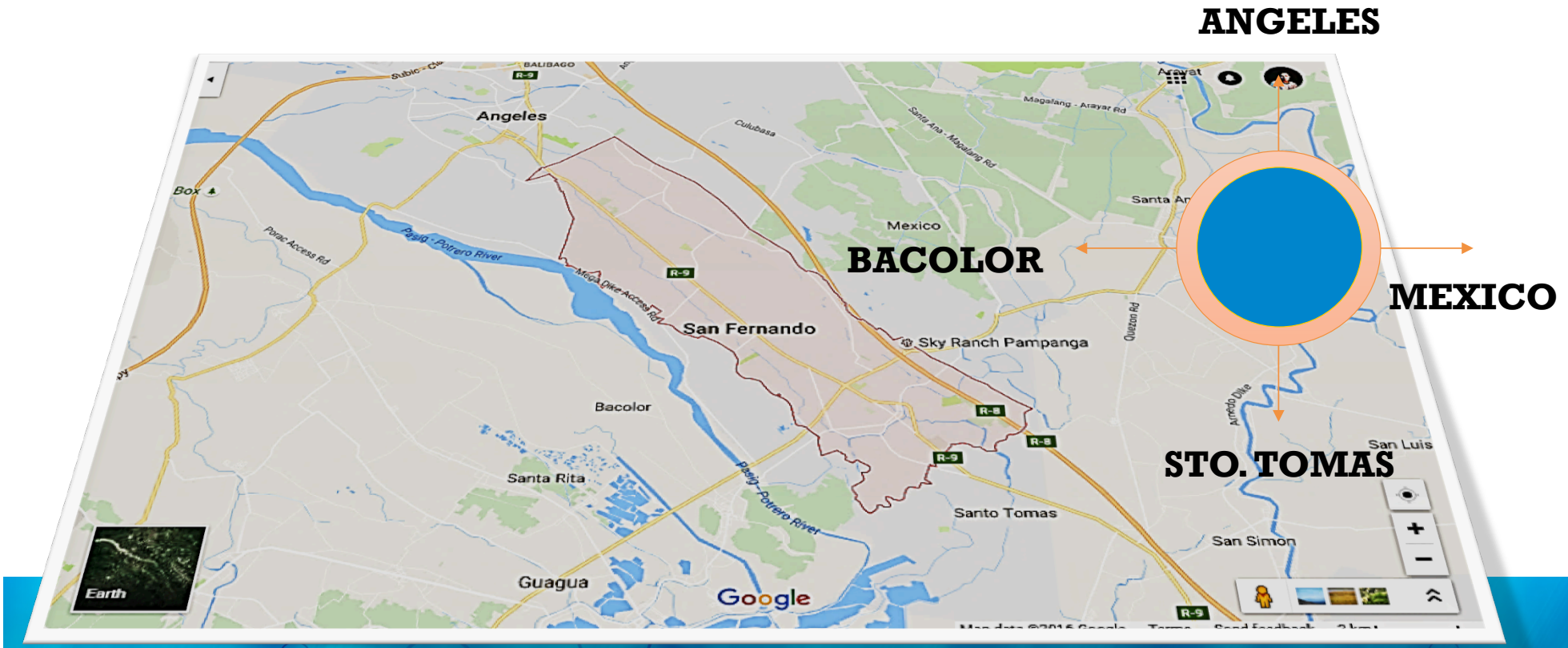
The top 10 least stressful cities are Stuttgart, Germany; Luxemborg City, Luxemborg; Hannover, Germany; Bern, Switzerland; Munich, Germany; Bordeux, France; Edinburgh, UK;, Sydney, Australia; Hamburg, Germany and Graz, Austria.

GATEWAY TO THE NORTH

CENTER OF TRADE AND COMMERCE

SEAT OF THE NATIONAL GOVT CENTER

HOME OF THE GIANT LANTERNS



SHARED BEST PRACTICES

RECOGNITIONS

CITY OF SAN FERNANDO, PAMPANGA

1st **2017 GAWAD KALASAG BEST CITY DISASTER RISK REDUCTION AND MANAGEMENT COUNCIL - *COMPONENT CITY CATEGORY***

2017 BEST GOVERNMENT EMERGENCY RESPONSE MANAGEMENT FOR BASIC SEARCH AND RESCUE (SAFRU) **2nd**

SHARED BEST PRACTICES

RECOGNITIONS

CITY OF SAN FERNANDO, PAMPANGA

2nd **MOST COMPETITIVE CITY, 2nd place for Economic Dynamism Pillar** conferred by the National Competitive Council during the 5th Regional Competitiveness Summit

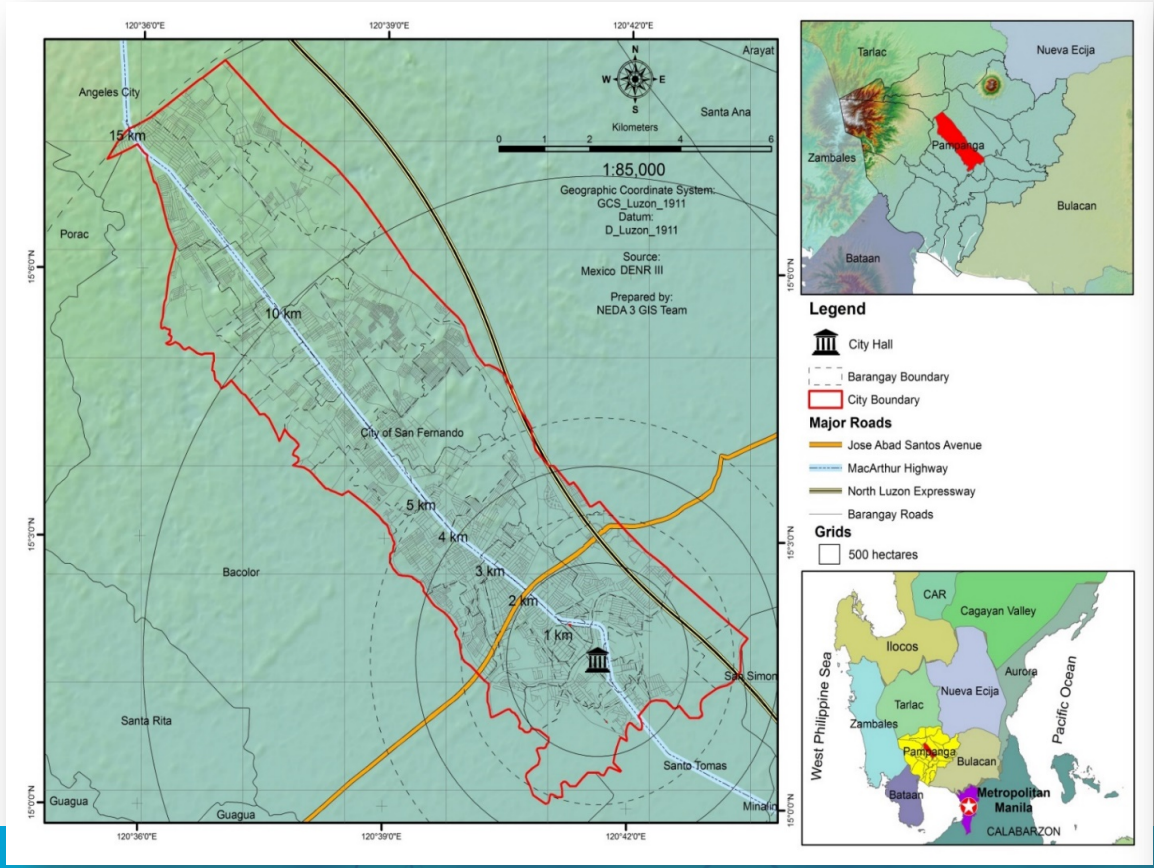
2017 SEAL OF GOOD LOCAL GOVERNANCE AWARD conferred by the Department of the Interior and Local Government Unit—November

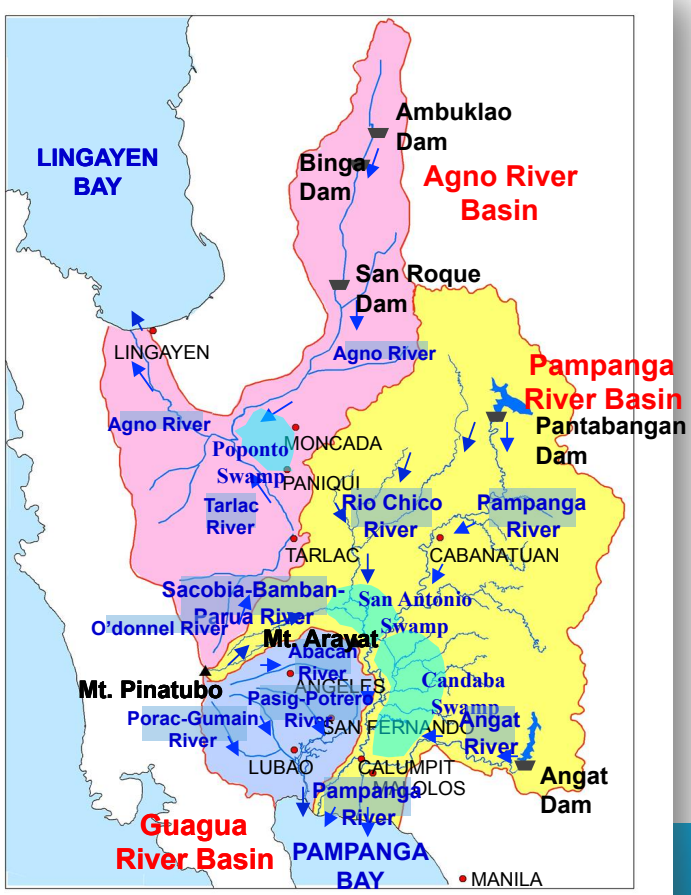
TOP MODEL CITIES in the Philippines during The Manila Times Philippine Model Cities awards—May

SHARED BEST PRACTICES

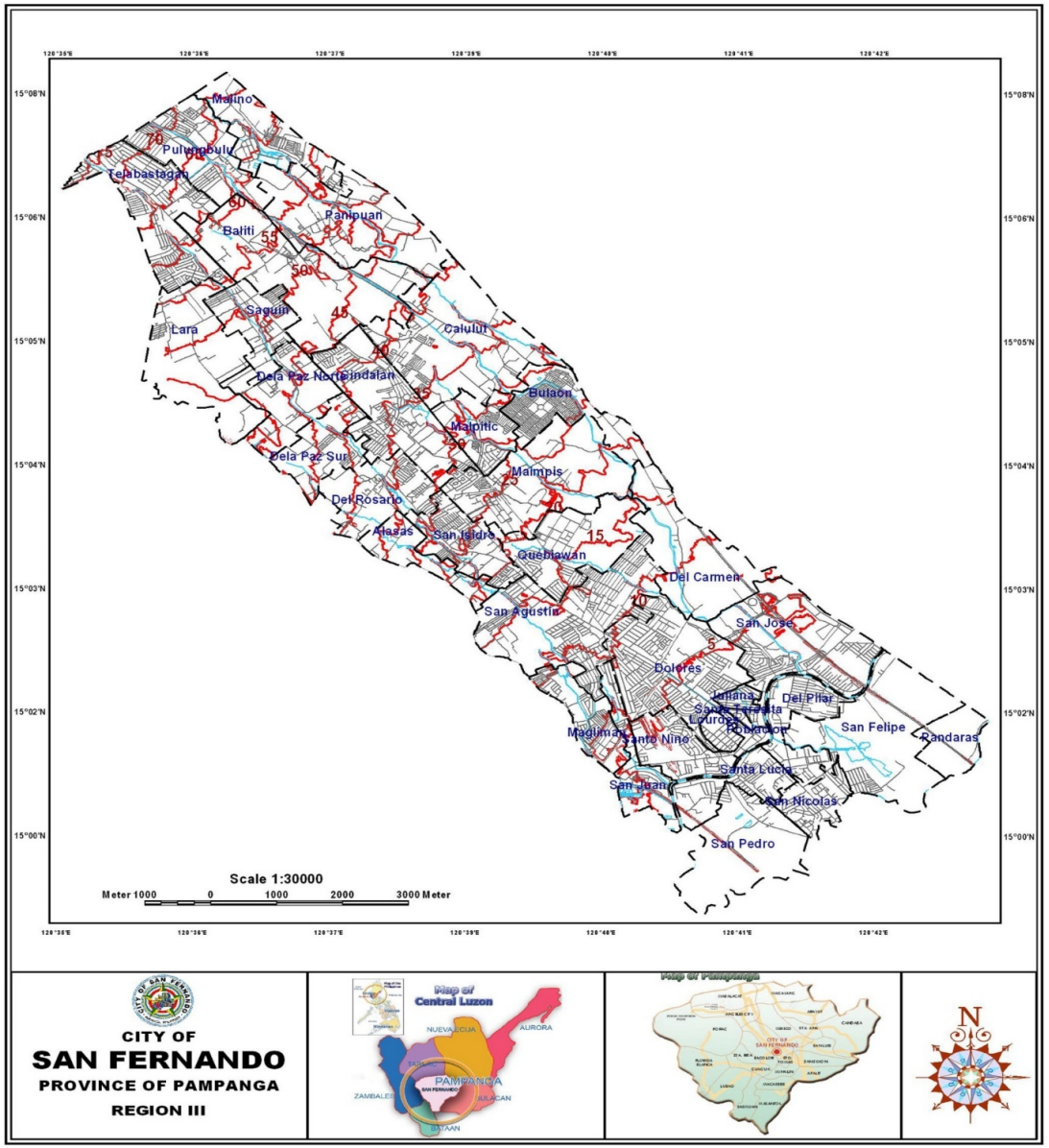
STUDY AREA

CITY OF SAN FERNANDO, PAMPANGA



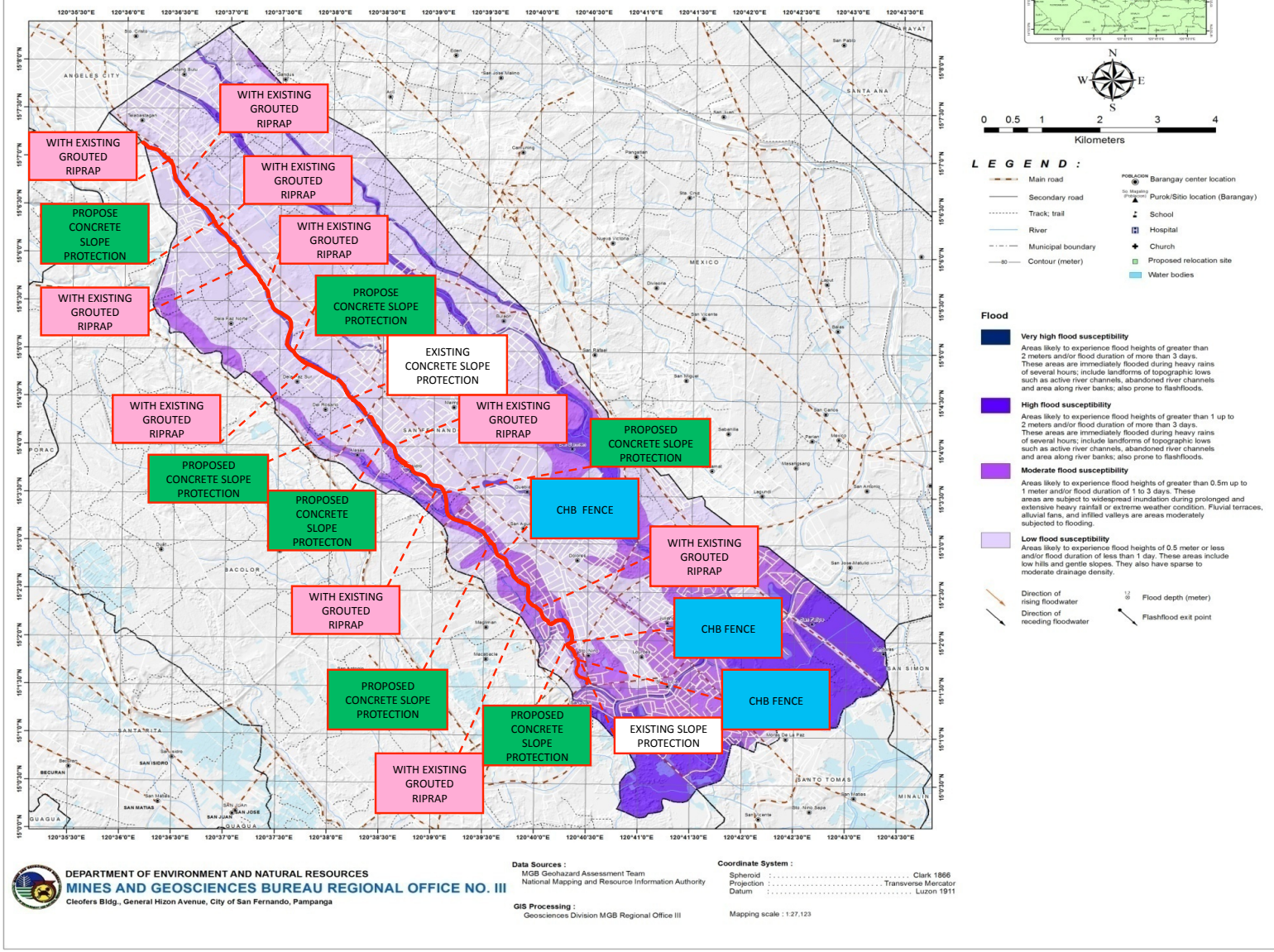


SHARED BEST PRACTICES



SHARED BEST PRACTICES

MAGLIMAN – TELABASTAGAN CREEK



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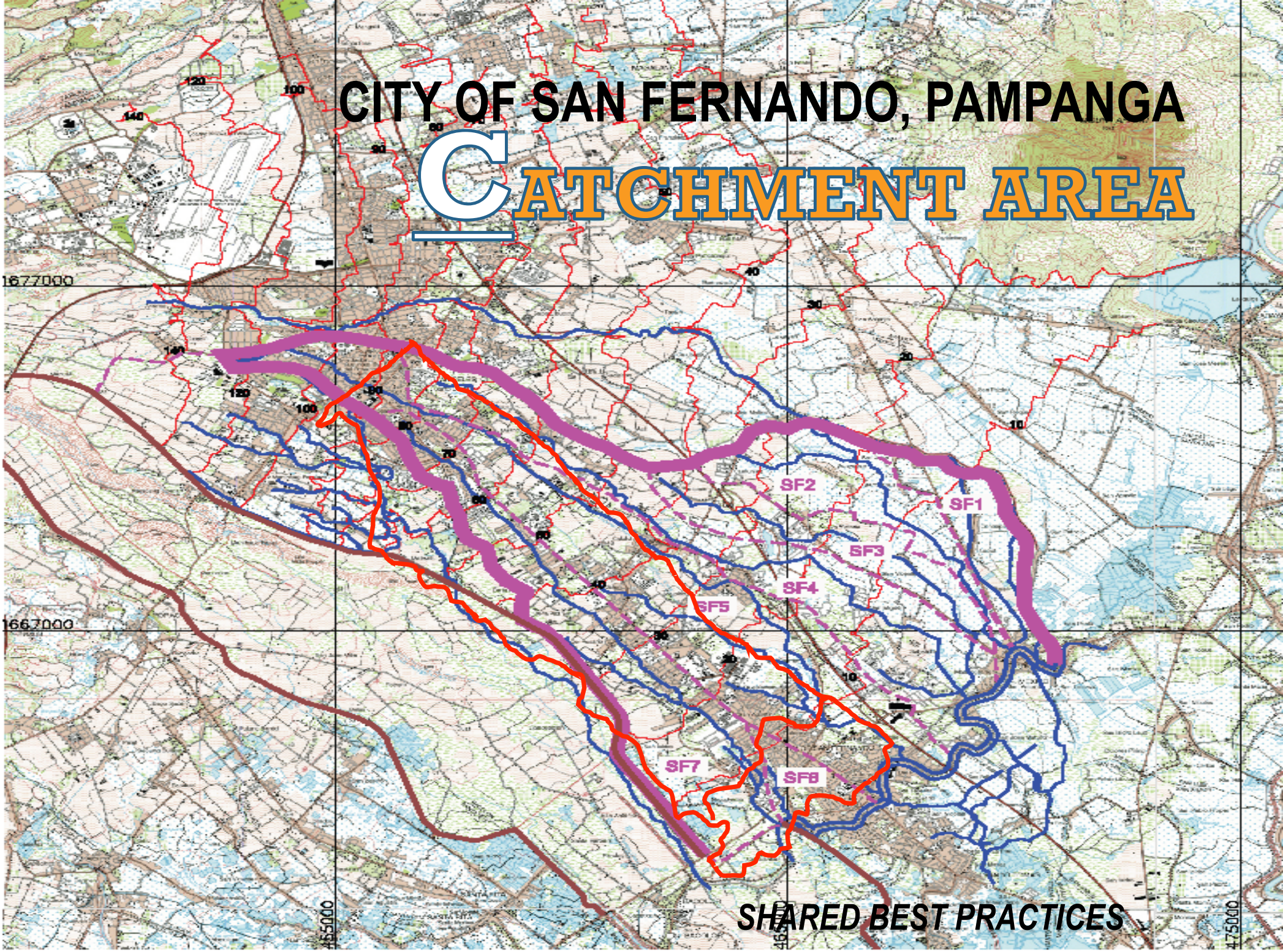
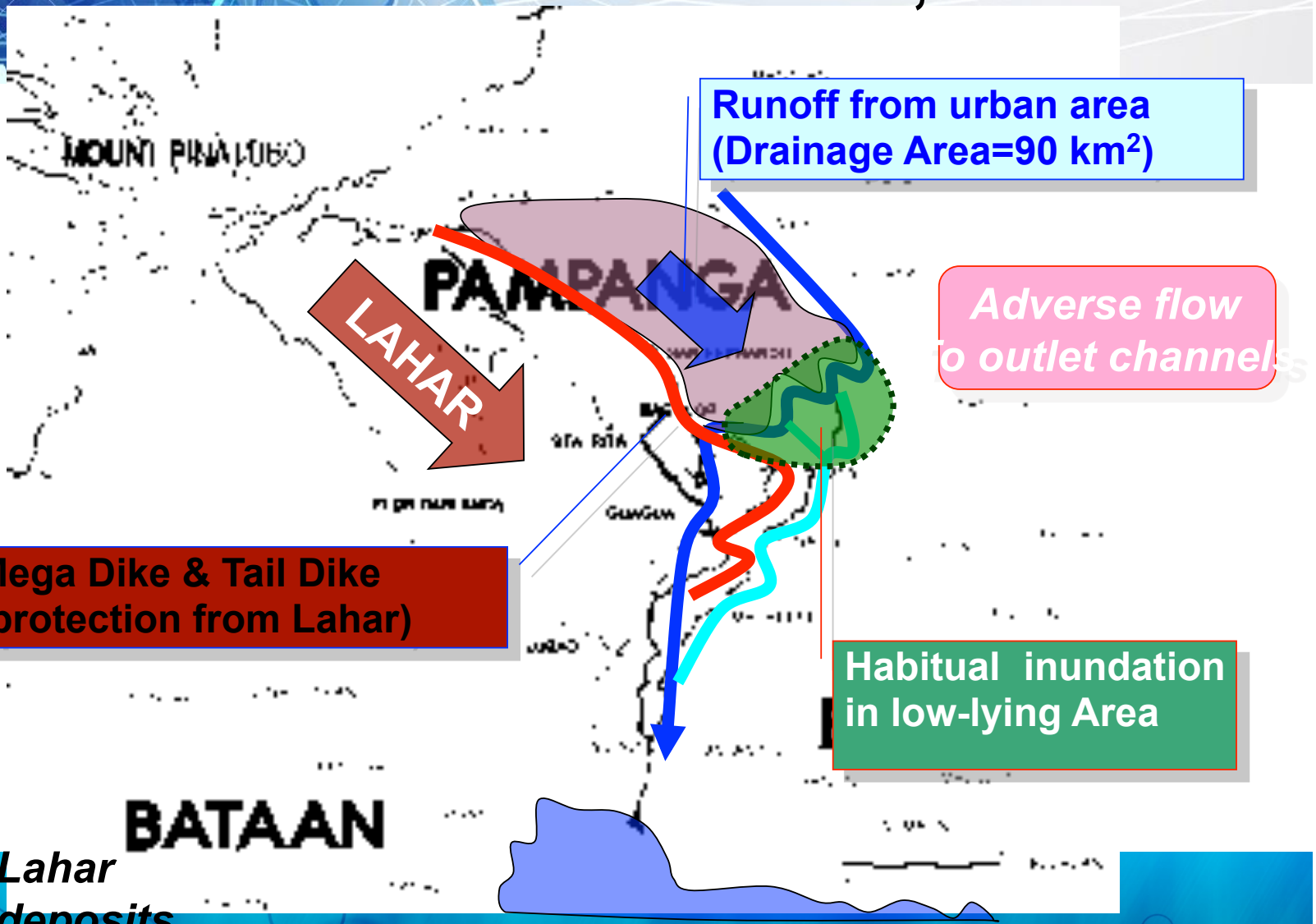
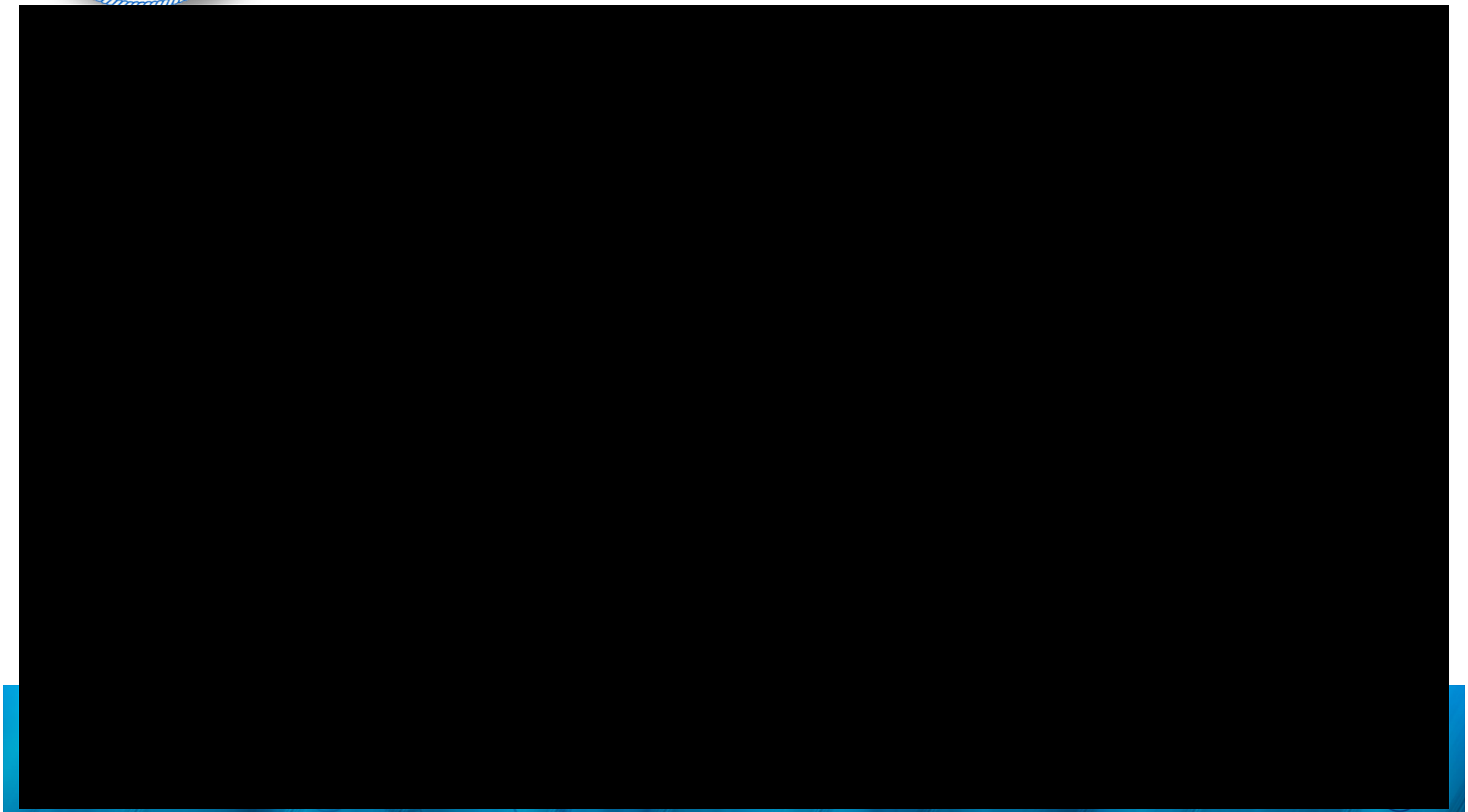
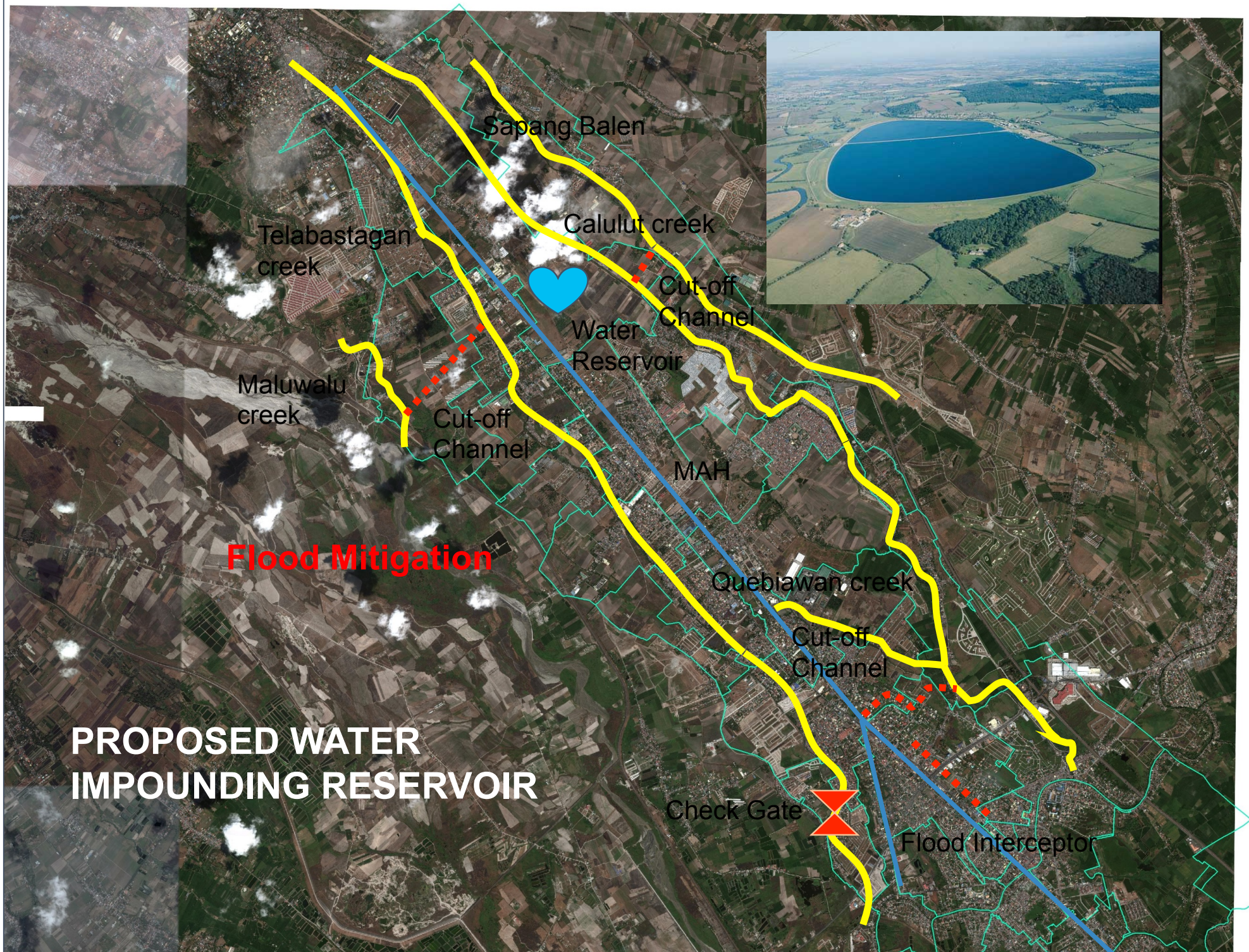

CITY OF SAN FERNANDO, PAMPANGA
CATCHMENT AREA
SF1
SF2
SF3
SF4
SF5
SF7
SF8
SHARED BEST PRACTICES

HYDROLOGICAL ANALYSIS
CITY OF SAN FERNANDO, PAMPANGA





SHARED BEST PRACTICES


Sapang Balen
Telabastagan creek
Calulut creek
Cut-off Channel
Water Reservoir
Maluwalu creek
Cut-off Channel
MAH
Flood Mitigation
Quebiawan creek
Cut-off Channel
PROPOSED WATER IMPOUNDING RESERVOIR
Check Gate
Flood Interceptor

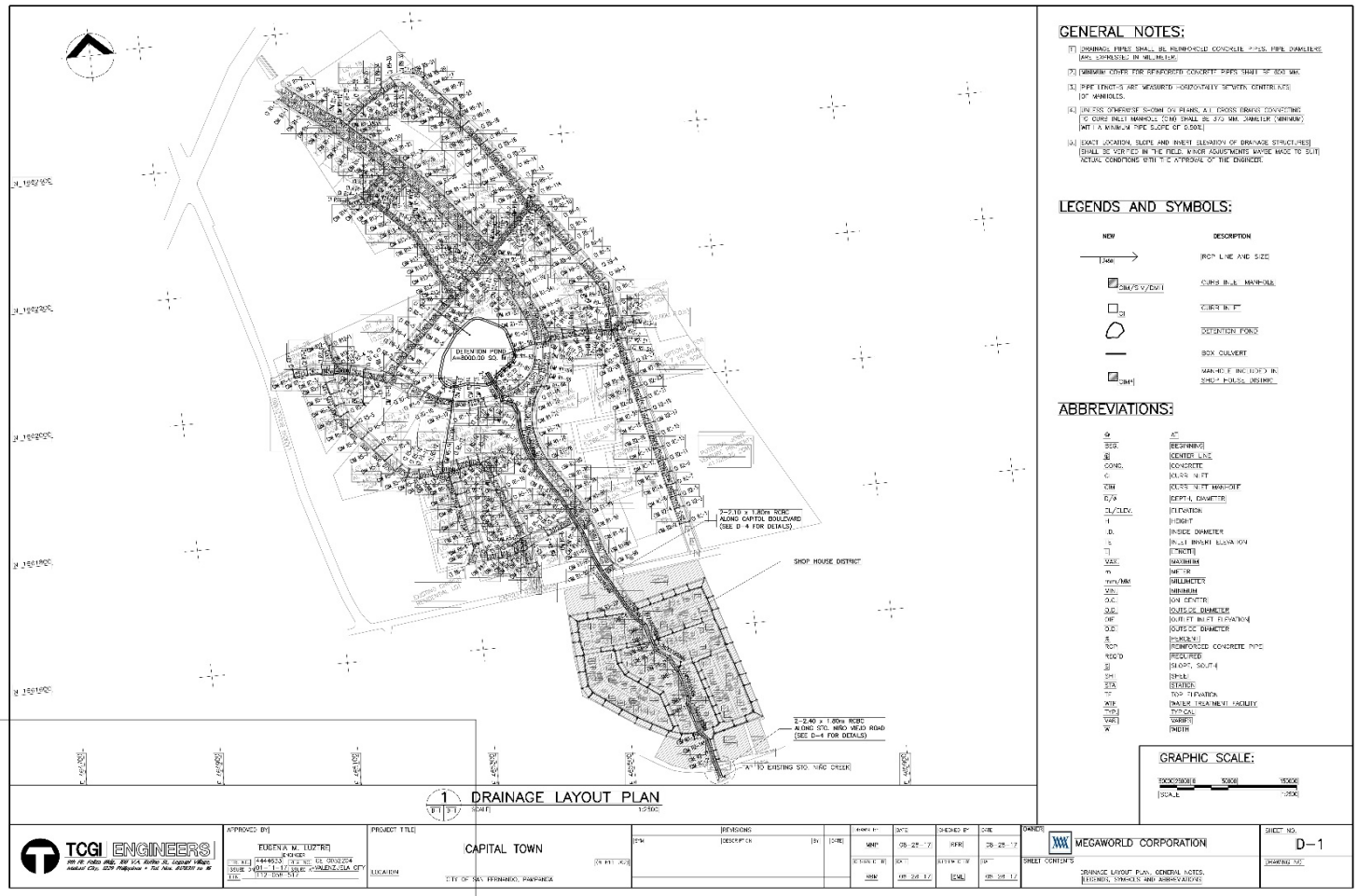
MEGAWORLD

CAPITAL TOWN AND SHOP HOUSE DISTRICT

SHARED BEST PRACTICES

MEGAWORLD

CAPITAL TOWN AND SHOP HOUSE DISTRICT



SHARED BEST PRACTICES

EVERY PERSON WHO PREPARES

is *ONE LESS PERSON*

who panics in crisis

-MIKE ADAMS

THANK YOU! ☺


FERNANDINO IMS MUMUKA
FERNANDINO
FIRST!
FERNANDINO IMS MAKIMUKA