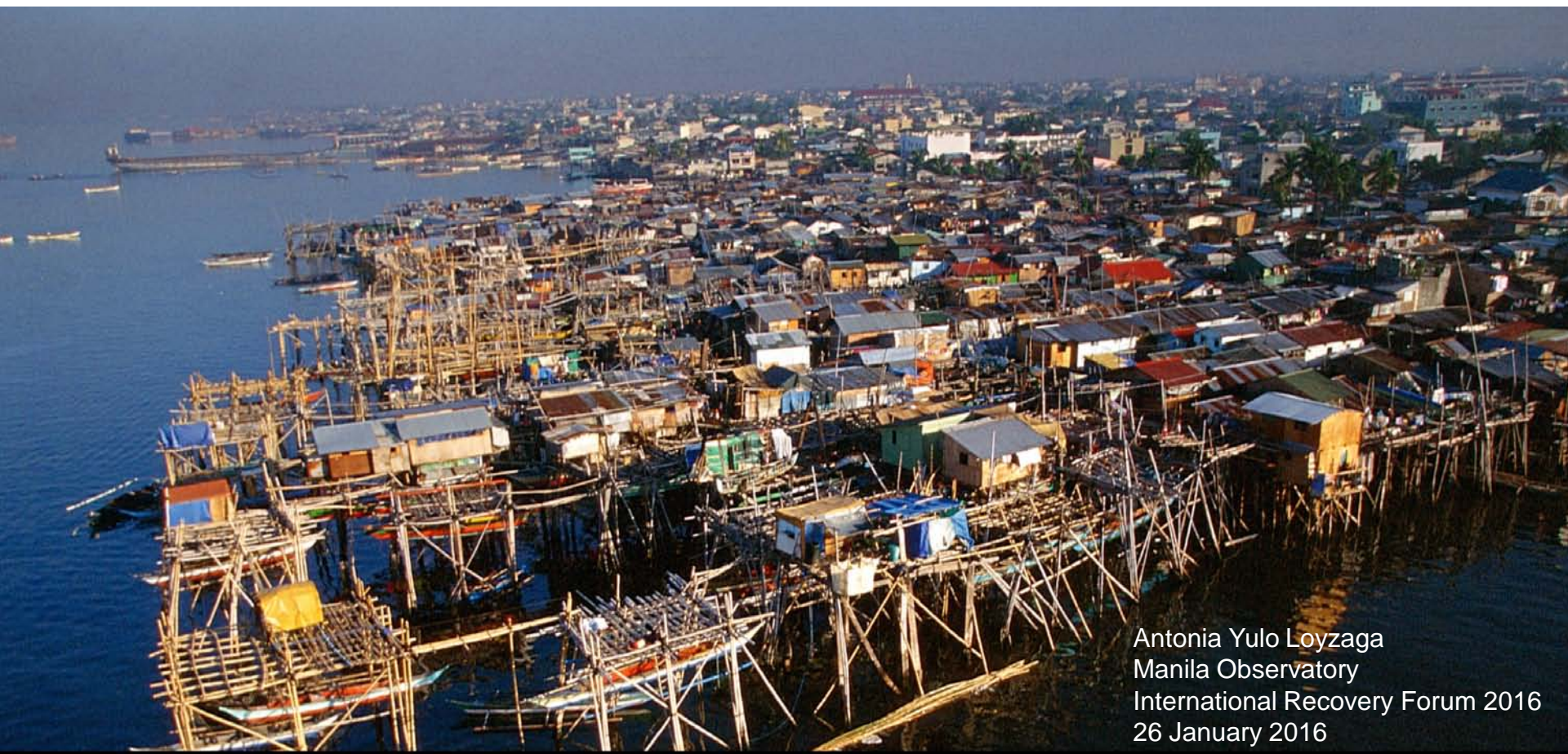




Building Back Stronger: Addressing Risk and Human Vulnerability in the Philippines



Antonia Yulo Loyzaga
 Manila Observatory
 International Recovery Forum 2016
 26 January 2016



Disaster recovery is defined as the “*differential process of restoring, rebuilding, and reshaping the physical, social, economic, and natural environment through pre-event planning and post-event actions*” (Smith & Wenger referenced in Smith, 2009)



Addressing Risk and Vulnerability: Lessons Learned in Pre- and Post-disaster Recovery Planning

- Adopt a systems approach to analyzing risk and vulnerability
- Support the translation science into policy and practice
- Craft metrics responsive to multiples sectors across space and time



Risk Refracts. Vulnerability is prismatic. (Parthasarathy,2008)



Ketsana Case Study: Shock to the Urban System

- 350 mm of rainfall in 6 hours
- Estimated 5 Million people affected and 500 dead and missing
- Combined with Typhoon Parma, World Bank estimated economic damages at US\$4.3Billion
- Meralco claimed losses of P830M
- Philippine Chamber of Commerce estimate P1Billion in business losses
- DPWH begins implementation of MM Flood Management Plan costing P351Billion in 2014

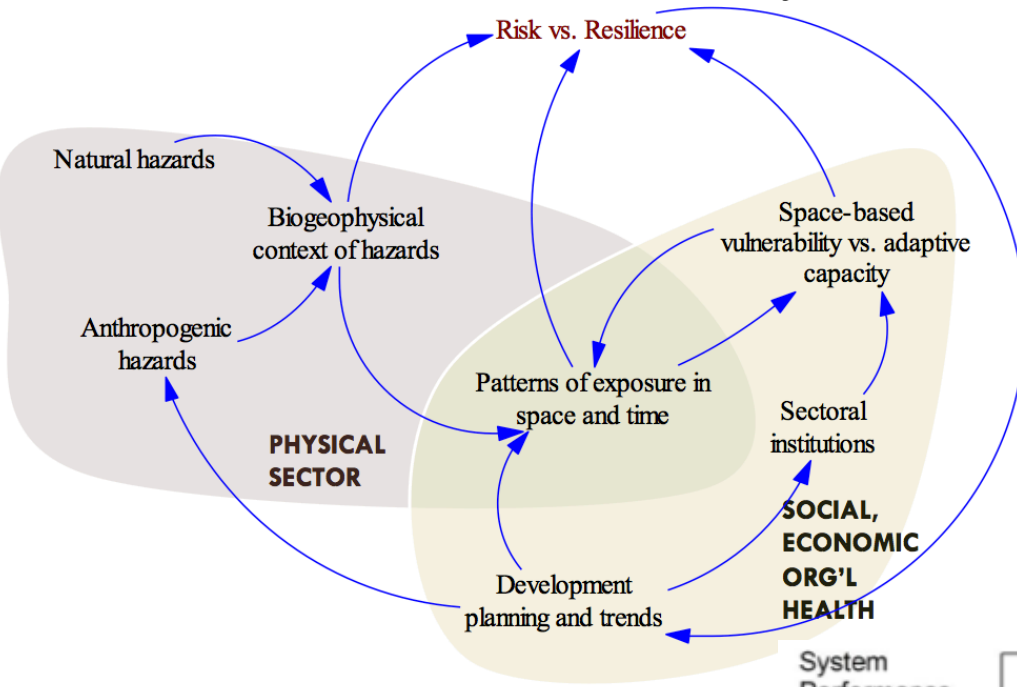


<http://newsinfo.inquirer.net/files/2014/03/0ndoy-deluge.jpg>



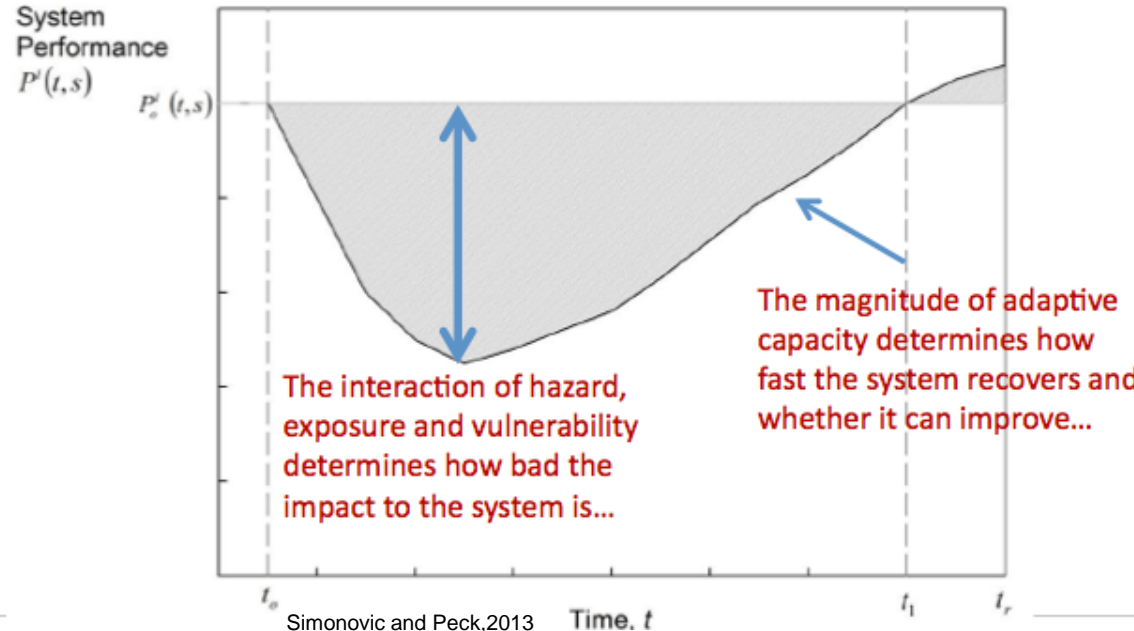


Need for a New Lens: Adopting a System Dynamics Approach



Atmospheric Physics
 Geology
 Epidemiology
 Remote Sensing and GIS

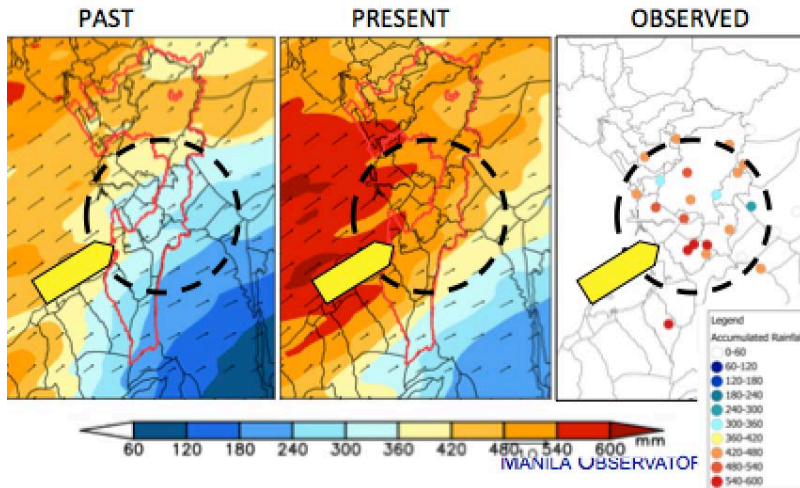
Economics
 Sociology
 Political Science
 Systems Science



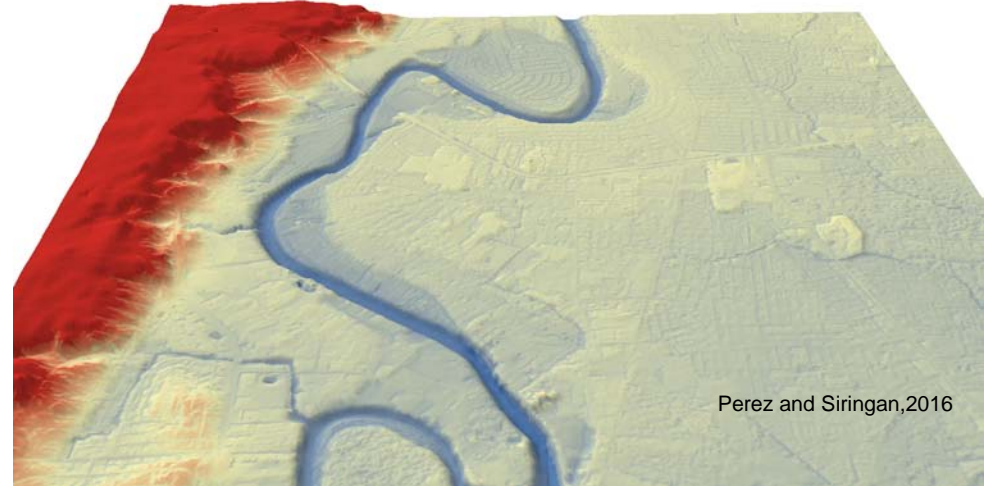
Mapping the Impact of Geomorphic Changes of Flow

Validating Modeled Analysis vs. Observed Data

5-Day Accumulated Rainfall (17Aug – 22Aug 2013)

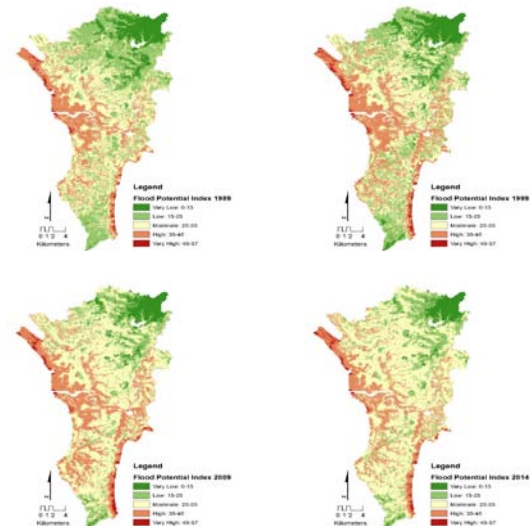


Gozo and Narisma, 2016



Perez and Siringan, 2016

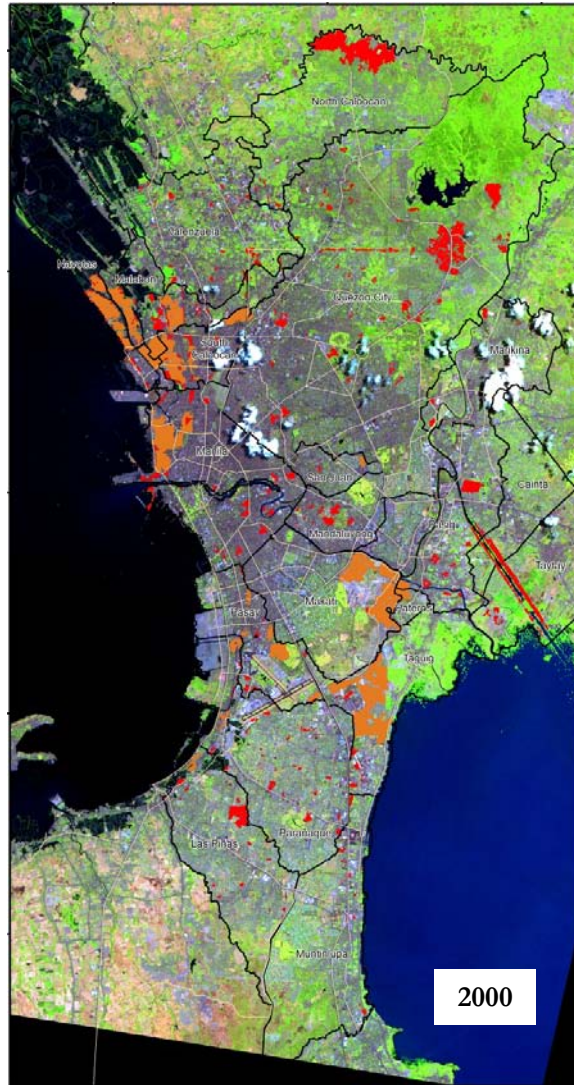
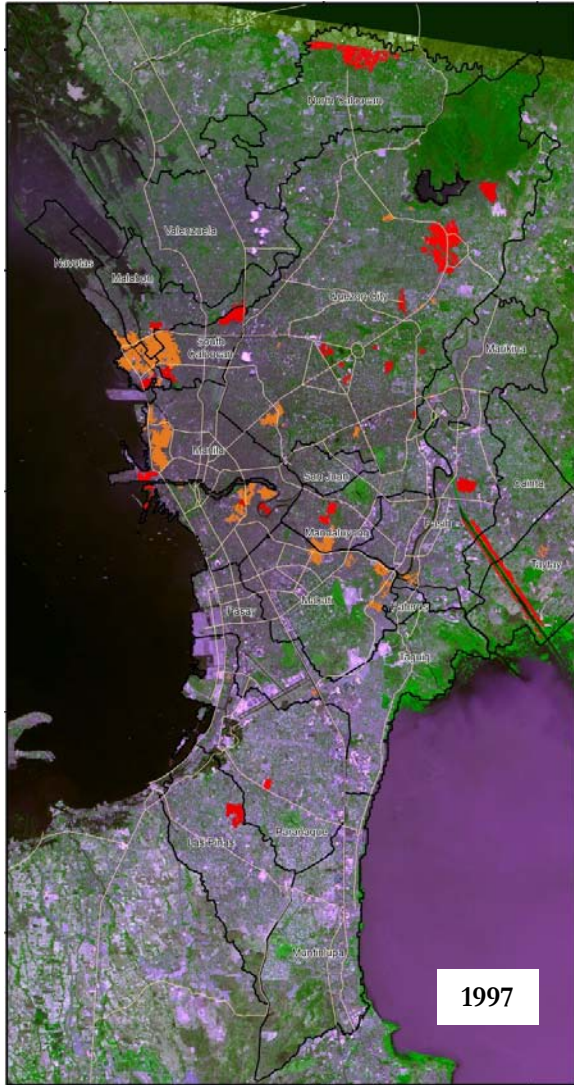
Land-use and Flood Potential



Del Castillo and Vicente, 2016



Tracking Exposure and Vulnerability over Space and Time



Comparison of results in study years 1997, 2000 and 2010. Red areas are informal settlements while the orange ones are mixed settlements.
Includes material © CNES 1997 and 2000, Distribution SPOIT Image, S.A., all rights reserved and Includes material © JAXA ALOS ANVIR-2 and PRISM 2010, all rights reserved

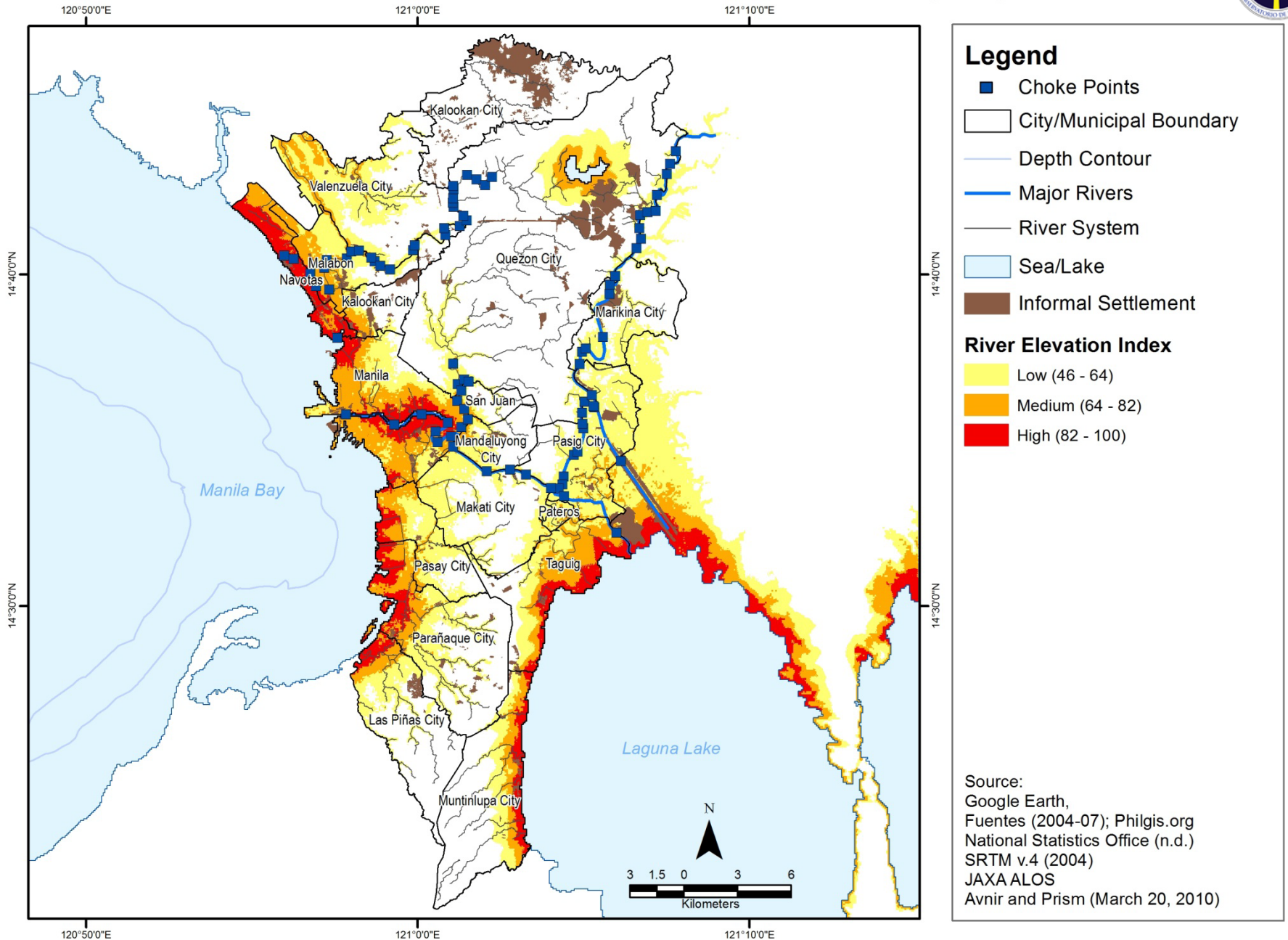


Informal Settlement



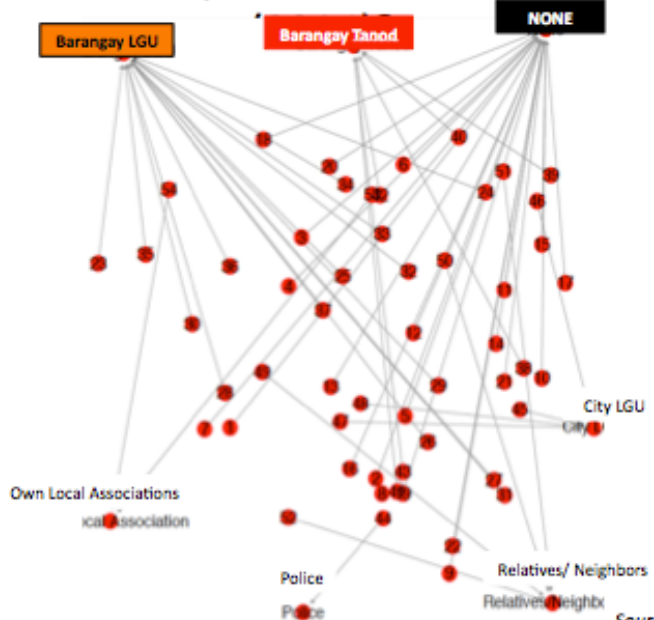
Mixed Settlement

Metro Manila Choke Points, River Elevation Index and Informal Settlements (2010)

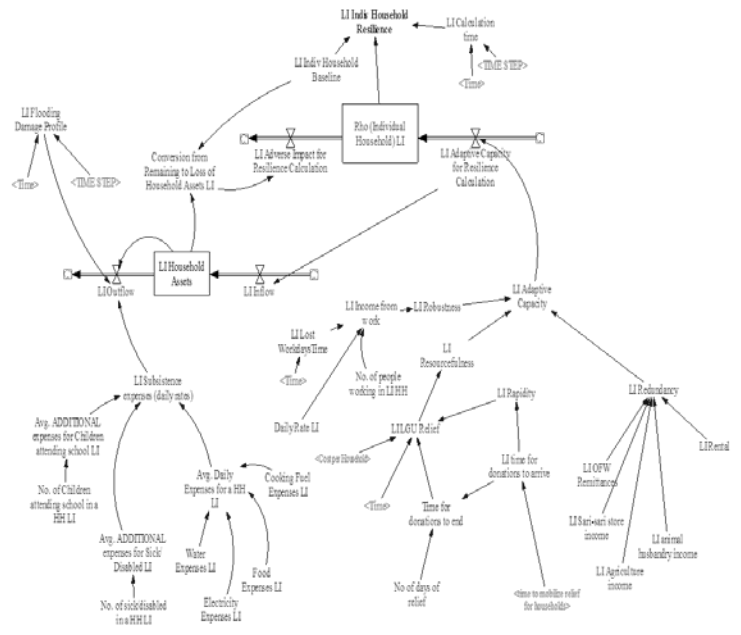


Social Dimension: Resilience, Social Capital, and Trust Networks

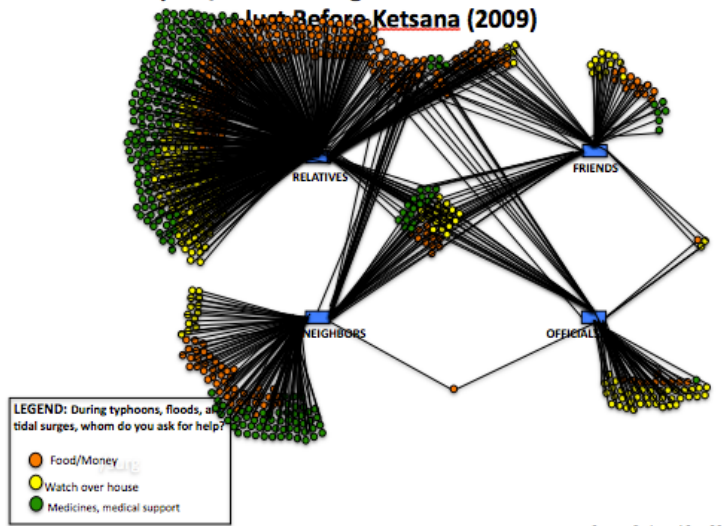
Social Capital & Changing Structure of Adaptation Residents: During typhoons and floods, from whom do you ask for help to watch over establishment



Source: Pario and See, 2015



Social Capital/Trust Among Vulnerable HHs in Metro Manila
Just Before Ketsana (2009)



LEGEND: During typhoons, floods, and tidal surges, whom do you ask for help?

- Food/Money
- Watch over house
- Medicines, medical support

Source: Pario and See, 2014

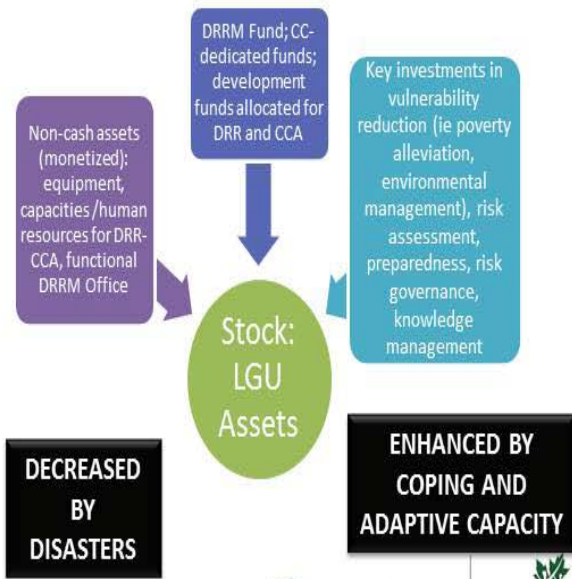
Organizational Dimension: Mainstreaming Systems Thinking



Source of Vulnerability: Funds and Fund Utilization

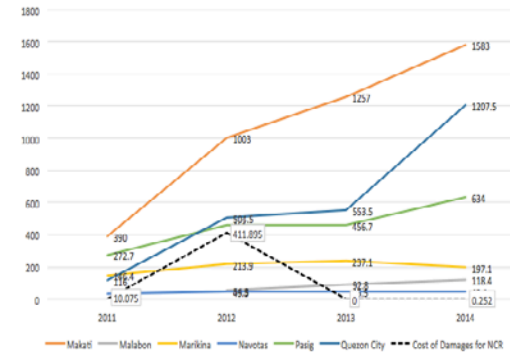


MODEL DEVELOPMENT



- ROBUSTNESS:** How much – internal and external resources?
- RESOURCEFULNESS:** What partnerships were established to raise those resources?
- REDUNDANCY:** How many are the sources of funds for DRRM and CC (internal and external)
- RAPIDITY:** How fast can the funds be mobilized?

Annual LDRRMF Appropriations of Partner Cities and Cost of Damages in NCR (in Millions of Pesos)

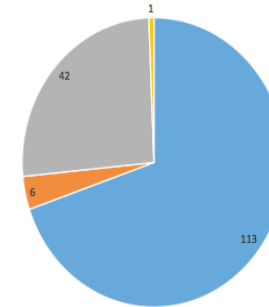


Bases of Cost of Damages in NCR
 2011-Pedring
 2012-Habagat 1 + Halkin
 2013-Habagat 2 + TS Marikina*
 2014-Marino
 *No damages in NCR were reported to the NDRRMC.

Data Sources:

Annual City Audit Reports 2011-2014, Commission on Audit
 NDRRMC Reports on Pedring, Habagat 1, Habagat 2, Mario

Distribution of Workshop Participants from Various Agencies in 2014 (Total No. of Participants: 162)



List of Workshops for 2014:
 LGU Consultation: 2/19/2014
 LGU Consultation: 5/22/2014
 LGU Consultation: 9/12/2014



Social Sciences and Humanities Research Council of Canada

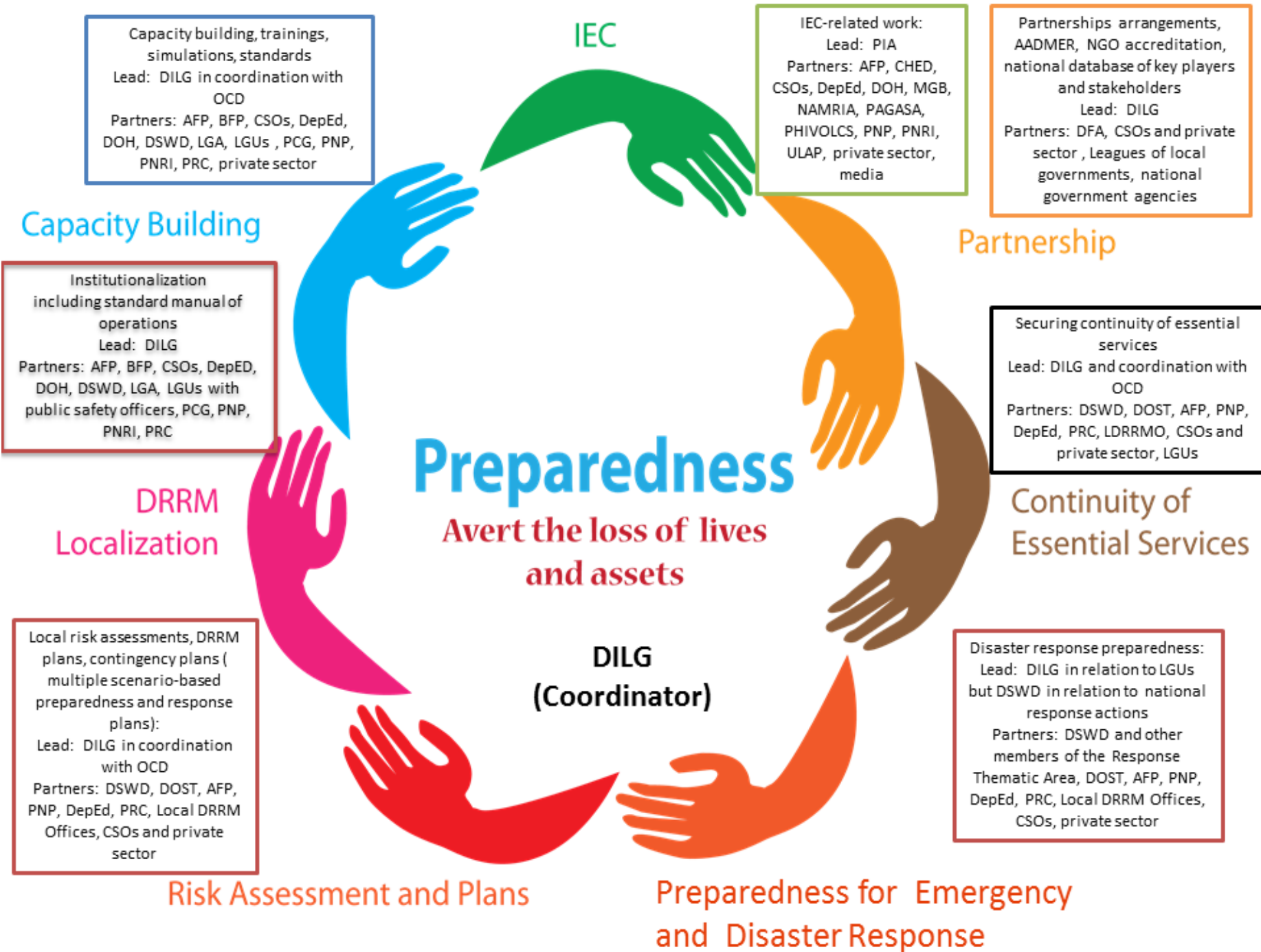
Conseil de recherches en sciences humaines du Canada

Canada

■ Metro Manila 6 LGU's
 ■ Regional/National Government Agencies
 ■ Academe/Research Institutions
 ■ Non-Government Organizations

National Disaster
PREPAREDNESS PLAN
2015-2028







Build Back Stronger: Enhancing Preparedness and Strengthening Governance Structures

Addressing the temporal and contextual context of resilience-building (see strategies and activities from pre-hazard up to prior to impact)

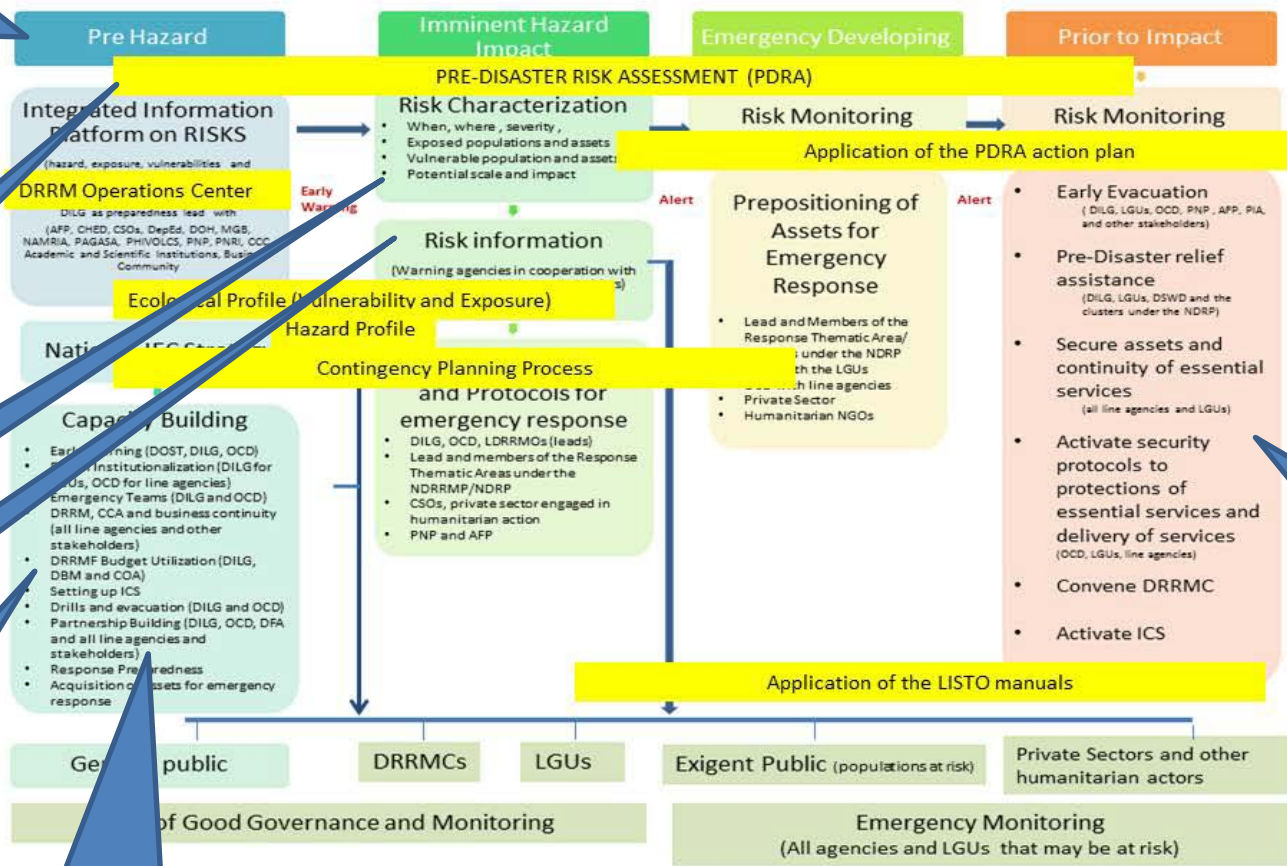
Risk refracts : risk monitoring vs one-time risk assessment

Ecosystems-based approach and vulnerability analysis

Risk vs hazard communication including the exigent public

DRRMF utilization: proposal resulting from CCAR orgl output

Inclusion, social capital, engaging communities: DRRM-CCA capacity and partnership bldg. See main text for details



Securing assets, building up stocks for resilience

National Disaster Preparedness Plan (NDPP) Philippines (DRAFT) for approval of the NDRRMC



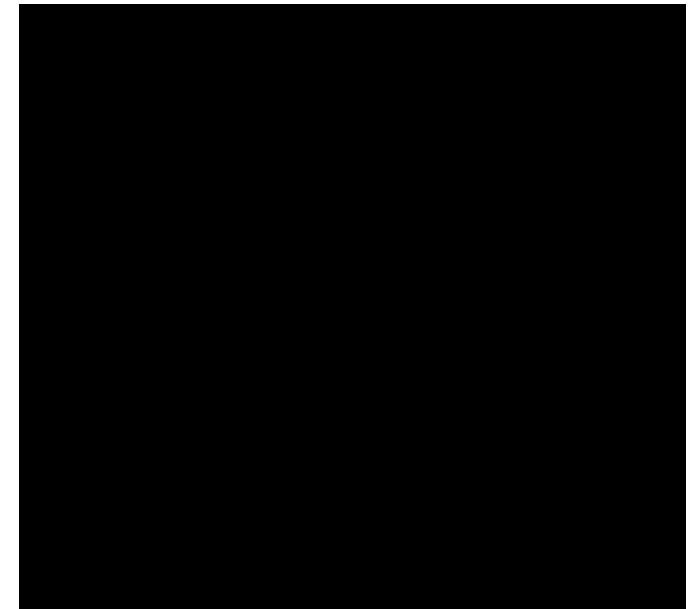
Postscript: Building Back Stronger After Haiyan



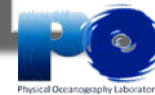
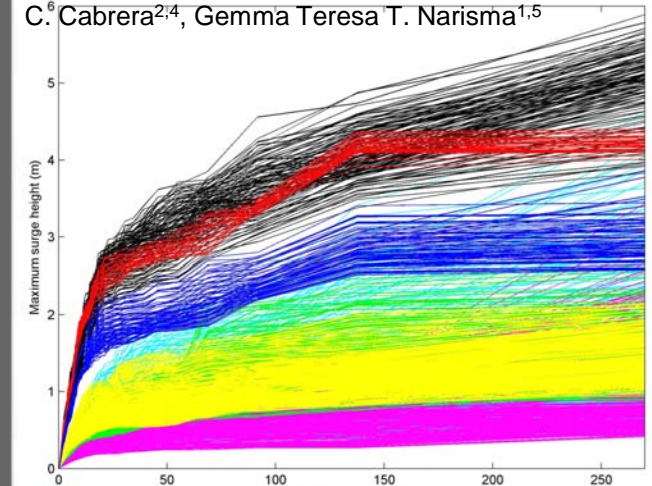
Source: World Vision



Source: ChristianAid UK



Coauthors: Margarita T. Rodrigo¹, Cesar E. Viramay¹,
Jeric C. Briones³, Princess Hope T. Bilgera², Olivia
C. Cabrera^{2,4}, Gemma Teresa T. Narisma^{1,5}



MANILA
OBSERVATORY

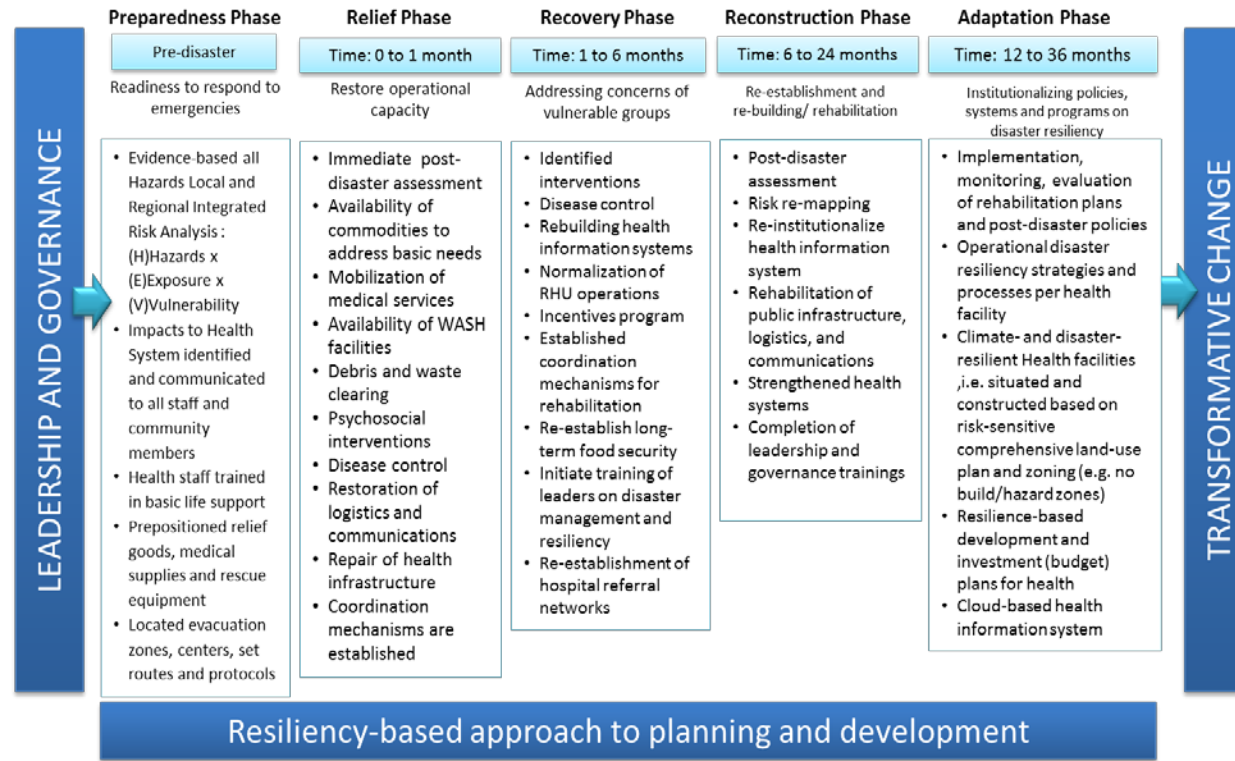




Postscript: Building Resilient Local Health Systems for Resilience in Post-Haiyan Samar

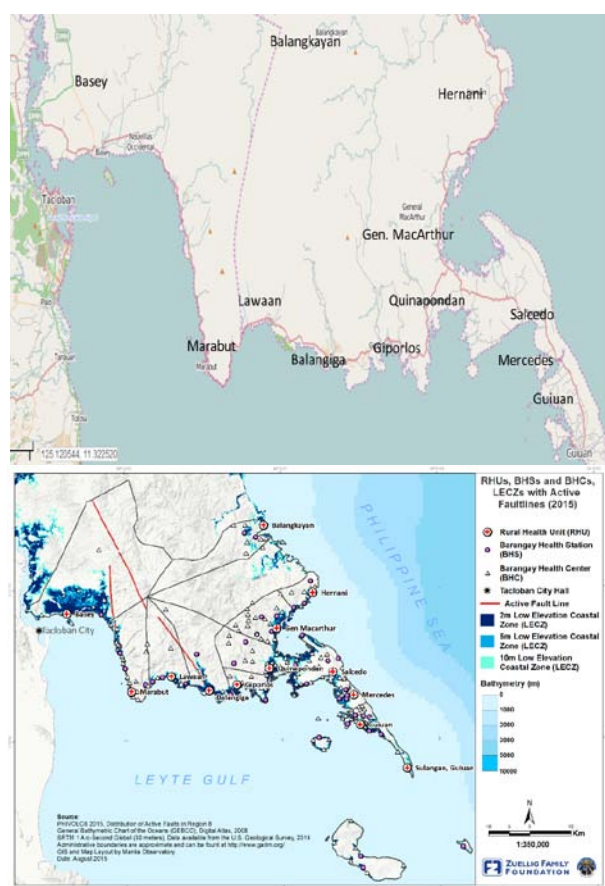


Emerging Framework of a Resilient Local Health System



Adaptation drives transformation in individuals, communities, institutions, and societies.

Sources: Framework based on inputs from Zuellig Family Foundation and Ms. Antonia Loyzaga, Executive Director, Manila Observatory



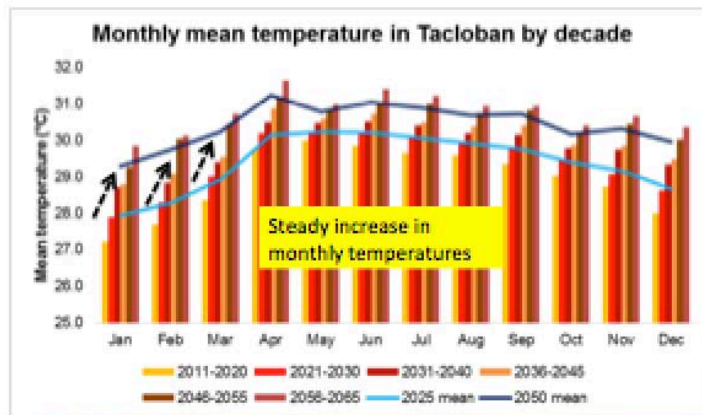


Postscript: Incorporating Climate Change Analysis in Recovery Planning for Tacloban City

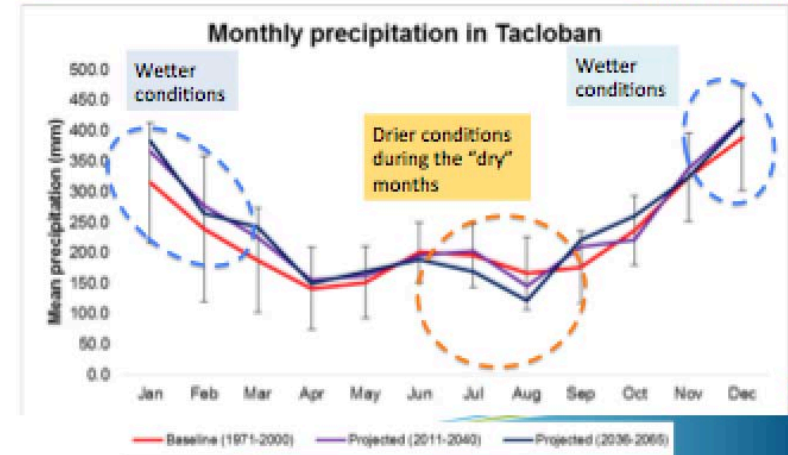


Be Secure Project
Water Security for Resilient Economic
Growth and Stability

Tacloban: TEMPERATURE Projections



Be Secure Project
Water Security for Resilient Economic
Growth and Stability



Tacloban City: Monthly Precipitation

- Rainfall is projected to increase in 2025 and 2050
 - *An increase in the frequency of days with intense rainfall is projected.
 - *The wet months become wetter at a higher rate than the "dry" months.
- The mean daily temperature in Tacloban City will increase by 1.4-2.4 degrees Centigrade by 2025, and by 1.5-4.0 degrees Centigrade by 2050.



- Dr. Emma Porio
- Dr. Gemma Narisma
- Dr. Kendra Gotangco
- Dr. Fernando Siringan
- Dr. Ramon Clarete
- Dr. John Wong
- Jessica Dator- Bercilla
- Dr. Celine Vicente
- Dr. Philip Arnold Tuano
- Dr. Rosa Perez
- Julie Dado and Monica Ortiz
- Emil Gozo, Justin See, John Paul Dalupang, Liz del Castillo, JoEd Perez
- Raul Dayawon
- MMDA, Partner LGUs from Metro Manila
- Ateneo de Manila University Department of Sociology and Anthropology, Department of Health Sciences
- University of the Philippines Marine Science Institute, University of the Philippines School of Economics
- Image of informal settlements by Neal Oshima from, *Lungsod Iskwater: The Evolution of Informality as a Dominant Pattern in Philippine Cities*, Alcazaren, et al, co-published by the Luis A. Yulo Foundation for Sustainable Development and Anvil Publishing, Inc. 2011
- Regional Climate Systems and Center for Environmental Geomatics, Manila Observatory



Thank you

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