Post-Disaster Recovery

Moving forward from Haiyan's impact in the Philippines
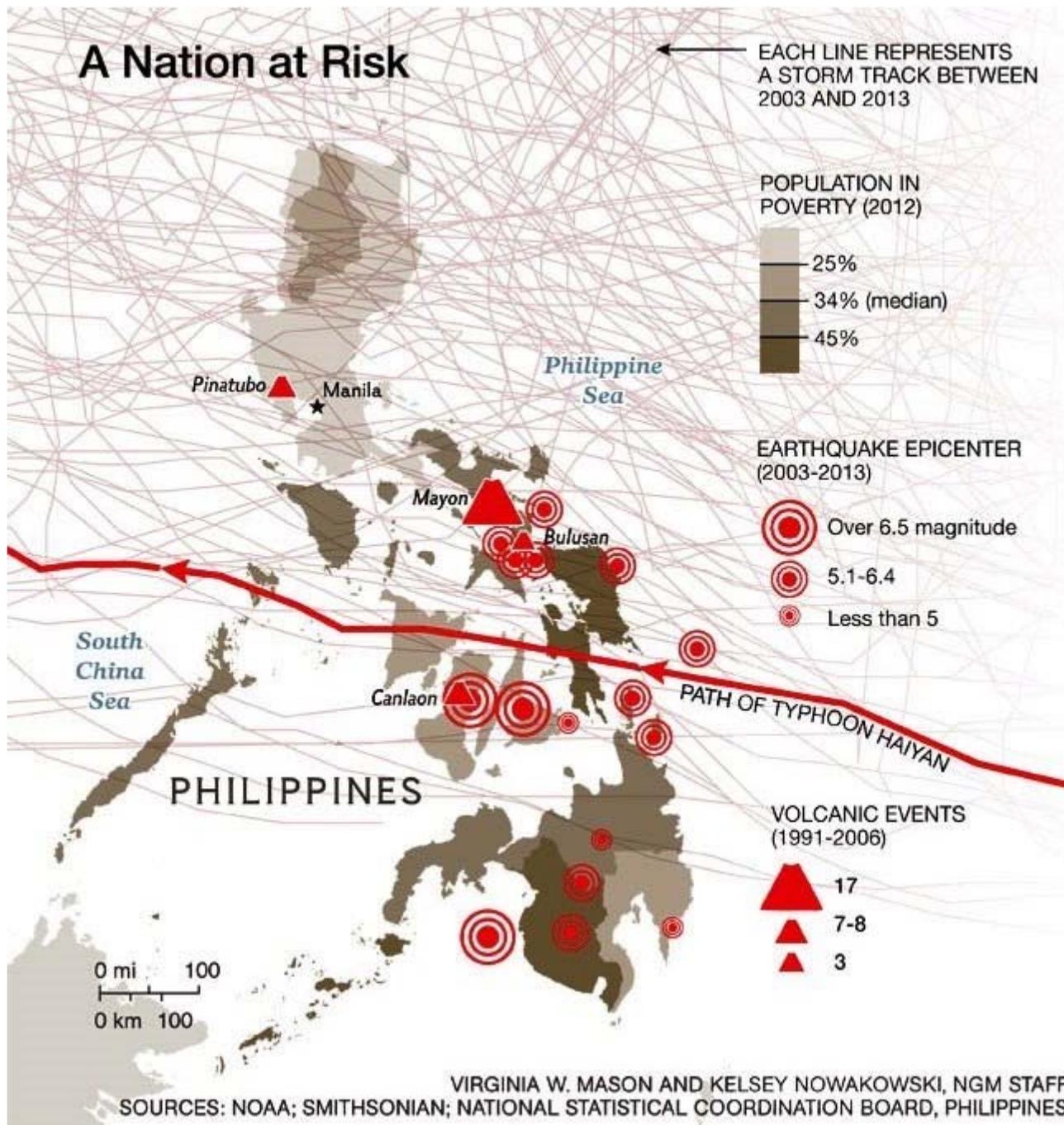
Jessica Dator-Bercilla, Dr. Gemma Narisma, Antonia Yulo-Loyzaga

Manila Observatory

With inputs from

Christian Aid and Partners

A Nation at Risk

EACH LINE REPRESENTS A STORM TRACK BETWEEN 2003 AND 2013

POPULATION IN POVERTY (2012)
- 25%
- 34% (median)
- 45%

Philippine Sea

Pinatubo Manila

South China Sea

Mayon

Bulusan

Canlaon

PATH OF TYPHOON HAIYAN

PHILIPPINES

EARTHQUAKE EPICENTER (2003-2013)
- Over 6.5 magnitude
- 5.1-6.4
- Less than 5

VOLCANIC EVENTS (1991-2006)
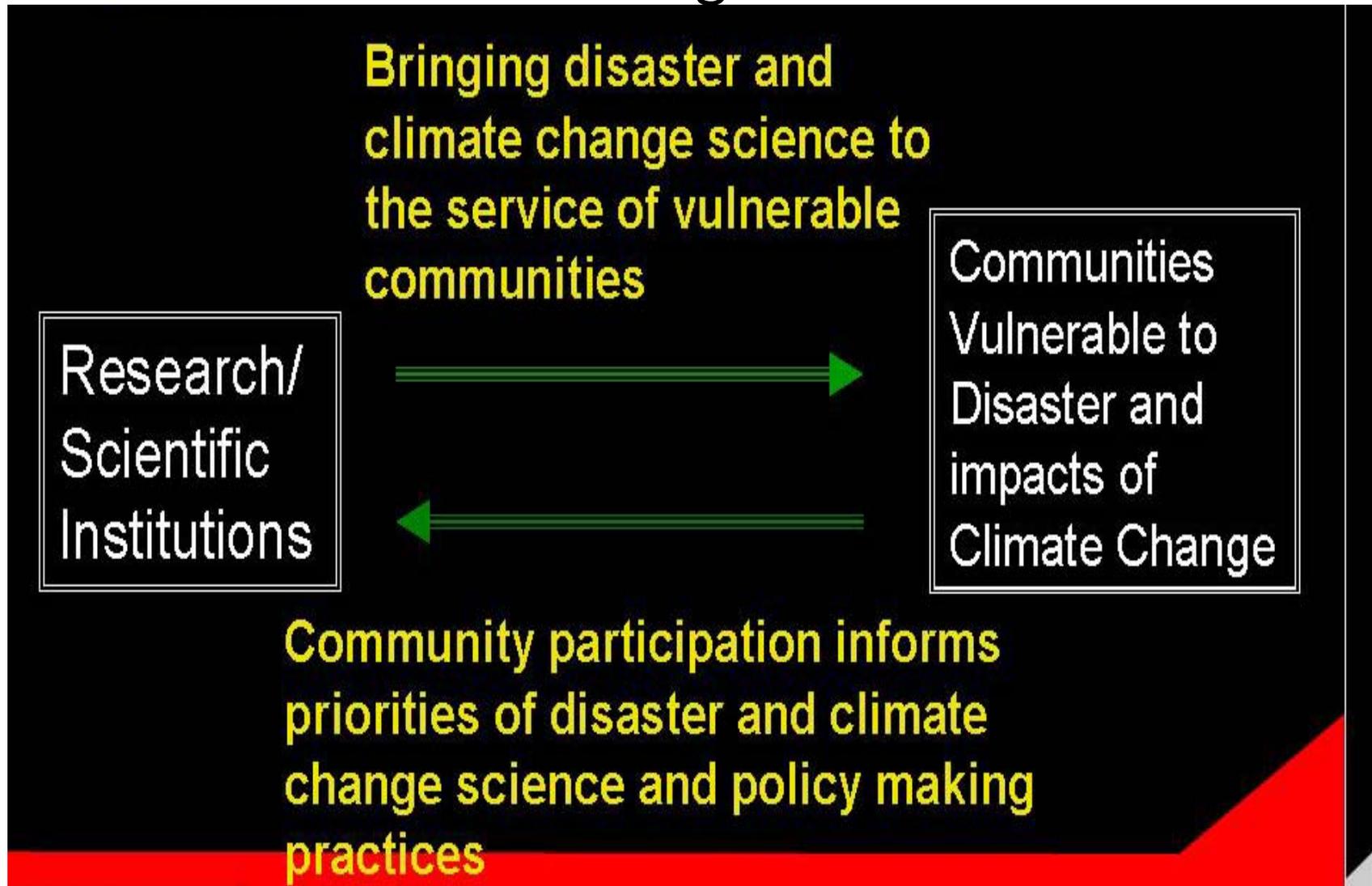- 17
- 7-8
- 3

0 mi 100
0 km 100

VIRGINIA W. MASON AND KELSEY NOWAKOWSKI, NGM STAFF
SOURCES: NOAA; SMITHSONIAN; NATIONAL STATISTICAL COORDINATION BOARD, PHILIPPINES

# Building Disaster Resilient Communities
Learning Circle

Bringing disaster and climate change science to the service of vulnerable communities

Research/ Scientific Institutions

Communities Vulnerable to Disaster and impacts of Climate Change

Community participation informs priorities of disaster and climate change science and policy making practices

The BDRC* Learning Circle

Scientists and Researchers from the Manila Observatory, UP National Institute of Geological Sciences, UP Los Banos, UP in the Visayas, the UP College of Social Work and Community Development (UP Diliman) and CA partners like the Social Action Center (Prelature of Infanta), Coastal Core Sorsogon, COPE Bicol, PhilNet-Visayas, Unlad Kabayan, CERD Samar, FORGE (Cebu), MUCAARD (Mindanao), Social Action Ministry (Prelature of Ipil), CARD Davao, MAHAL in Mindoro and MACEC in Marinduque in partnership with

christian aid

Risk Mapping and Typhoon Tracking
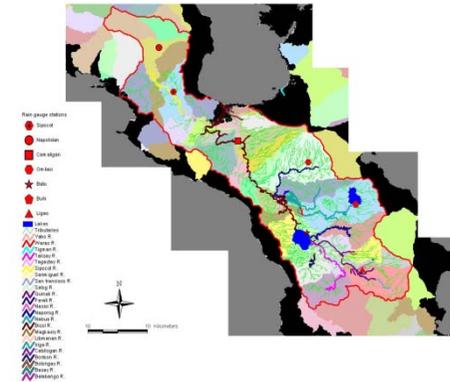
Participatory Capacities and Vulnerability Assessment
All Areas

Software and Tools Development for Risk Assessments

Flood-Resistant Crops

Preparation of emergency food packs from
Vegetables the farmers planted

Earlier Experiences of Scientists and Communities Working for Recovery

2004 Debris Flow

Design and testing of integrated farming system technologies in flood-stricken agricultural lands

From grasslands

Seven varieties of upland rice were tested in Bukid-aralan as a component of the upland rice-based cropping systems

M108 – 5 tons/ha
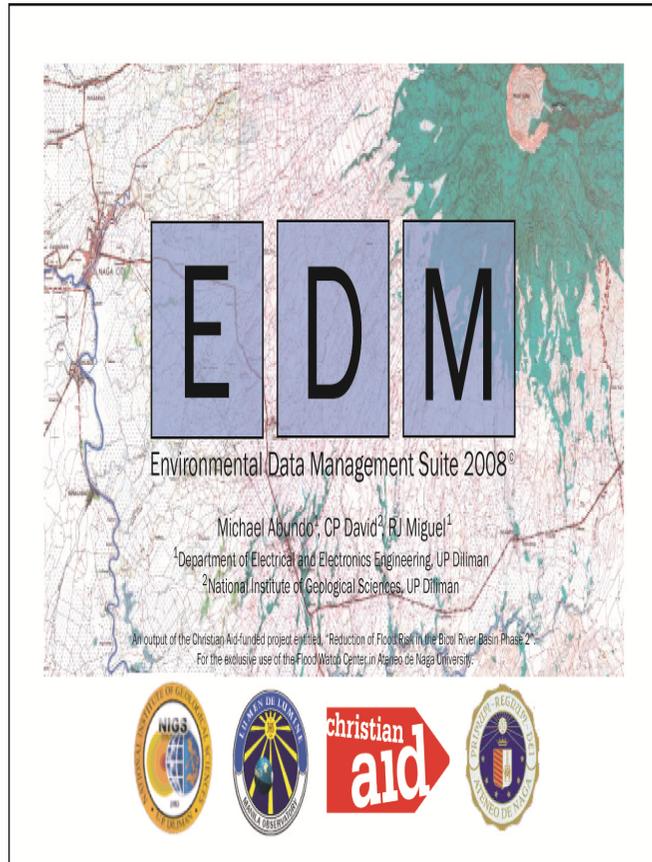
3.5 tons/ha

RC 5

AG5

3.6 tons/ha

5 tons/ha

RC 9
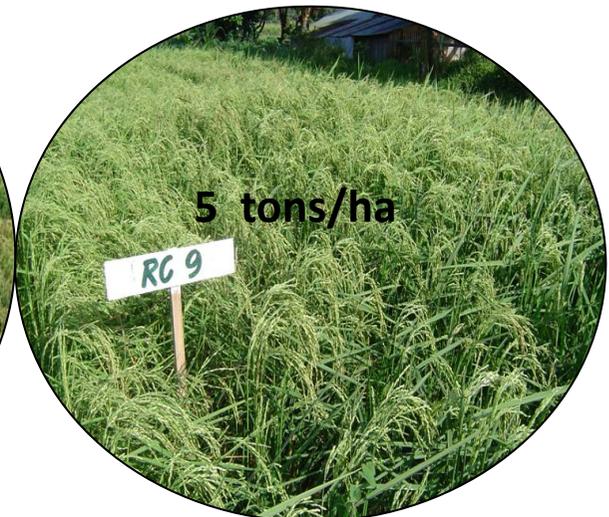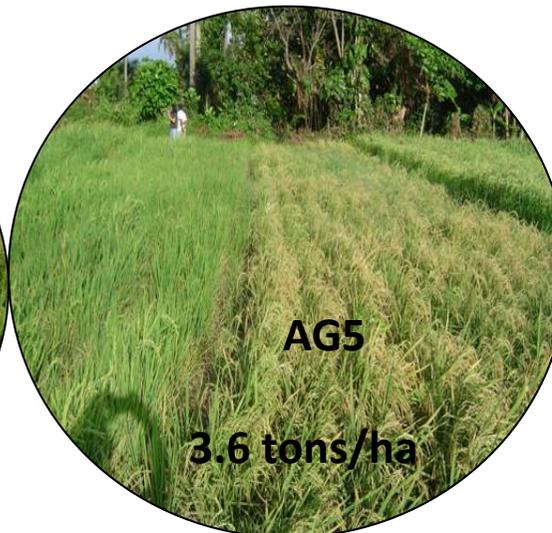
POST DURIAN 2006

POST DURIAN 2006:
Risk Assessment
Early Warning System

Home-based weather stations that communicated data via SMS to scientists in the typhoon and floodwatch centers

1. Satellite Image Picture Fetcher
2. SMS Data Manager
3. Text Alert Console

Replication of the approach in 2004 Debris-Flow affected areas in Northern Quezon

Upland – Lowland Flood Level monitoring and calibration - Infanta (SACI, MO, UP NIGS)

Manual rain gauges – Infanta (SACI); Bicol River Basin (MO-UPNIGS)

Community-based and Redundant communication systems Infanta (SACI)

Floodwatch
Siay (SAM Ipil); Legazpi City (COPE)

Monitoring the Impacts of Disaster Risk in Albay Province: Towards Risk-Sensitive Development

Climate change may result in more frequent and severe weather patterns in the eastern region of the Philippines. While climate change and factors related to it may remain undefined for sometime, building capacity on the local level to handle impending disasters can improve a province's present ability to cope with disasters and provide urban and rural communities with greater resiliency.

The objectives of this study are to: assess major meteorological factors (e.g. typhoon, temperature increase, rainfall change and storm surges) and geophysical factors (e.g. lahar flow, floods and landslides) affecting the sub-watersheds around the vicinity of Mayon Volcano in Albay Province; validate and analyze disaster risk (R), where the compounding effect of major meteorological and geophysical hazards as modelled via the UNDP formula R $\equiv$ Hazard (H) x exposure (E) x vulnerability (V) or R=HEV shall be approximated and mapped; and recommend optional climate change adaptation and disaster risk management options.

The methods applied on the climate/ weather-related and geophysical risk mapping are regional climate modelling and downscaling as well as remote sensing and geographic information systems techniques. Results indicate several areas that have high risk scores due to meteorological and geophysical factors.

Albay is one of six provinces of Bicol Region located at the Southeast Luzon of the Philippines. Albay is bounded on the north by Camarines Sur, and on the south by Sorsogon. The Lagonoy and Albay Gulfs form the coastal regions of the northeast, while the Burias Pass separates the province from the island of Burias. In the west lie low and rolling mountains while in the east rise the high, volcanic Mountains of Mayon, Malinao, and Masaraga.
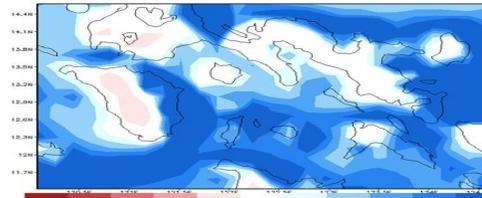
Rainfall and temperature anomaly between 2000 to 2006 and 1980 to 1986 during wet season

60 km resolution

20 km resolution
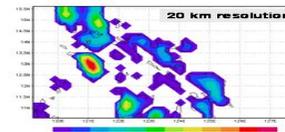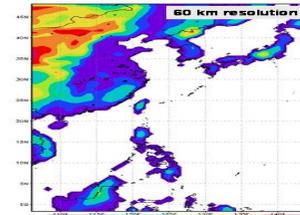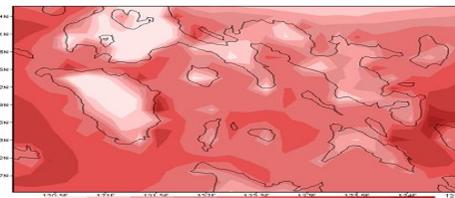
Typhoon hazard map based on the typhoon occurrences from the Joint Typhoon Warning Center (JTWC) from 1945 to 2003

Very Low
Low
Medium
High
Very High
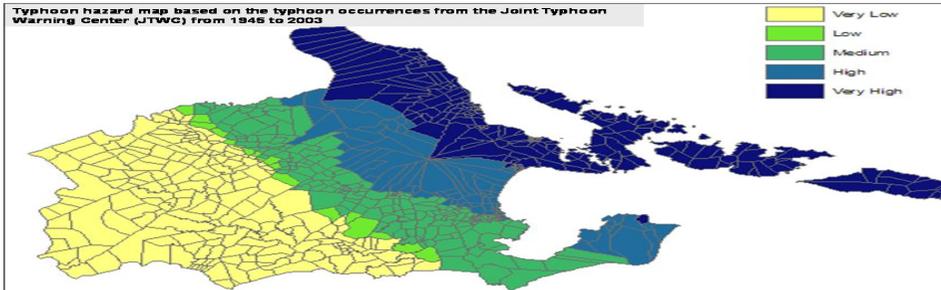
The meteorological factors considered are temperature increase, rainfall change, typhoon occurrences and storm surges. Rainfall and temperature changes during dry and wet season of Albay were downscaled from global models using RegCM3, the Abdus Salam International Centre for Theoretical Physics (ICTP) model.
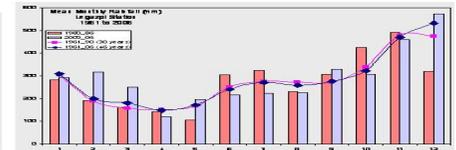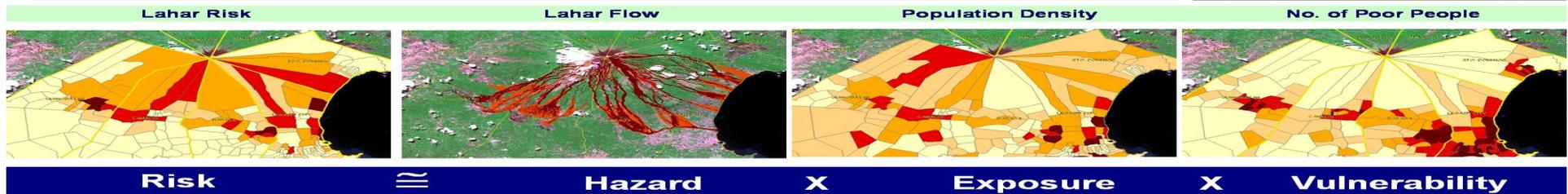
Lahar Risk (R) is computed based on 3 parameters:

- **Hazard (H)** — Computed using the formula $\Sigma(w^2 \times Area)$ where w is the weight based on proximity to the lahar path and A is the lahar area. The closer to the lahar path and the larger the lahar area, the higher the hazard score.
- **Exposure (E)** — Represented by population density (person/ sq. km.). The higher the population affected, the higher the exposure score.
- **Vulnerability (V)** — Represented by the no. of poor people. No. of Poor People = Municipal Poverty Incidence x Barangay Population. The higher the no. of poor people the higher the vulnerability score.

We can now identify barangays that are at high risk to lahar ranking them according to the computed risk score. See table at the right for the lahar risk ranking by barangay.

Rank	LAHAR RISK Barangay	Municipal
1	BINITAYAN	DARAGA
2	TAGAS	DARAGA
3	SAN RAFAEL	GUINOBATAN
4	BGY 32 SAN ROQUE	LEGAZPI CITY
5	TRAVESIA	GUINOBATAN
6	BGY 49 BIGAA	LEGAZPI CITY
7	BGY 44 PAWA	LEGAZPI CITY
8	QUIRANGAY	CAMALIG
9	BGY 53 BONGA	LEGAZPI CITY
10	LIBOD	CAMALIG

Lahar Risk

Lahar Flow

Population Density

No. of Poor People

Risk $\cong$ **Hazard** X **Exposure** X **Vulnerability**

Participatory Housing Design

Post Fengshen 2008:

Climate-Resilient Farming Informed
Iloilo (PRDCI) and informed by Manila Observatory
analysis

Preparation of Emergency Food Packs
(PRDCI and UP in the Visayas)

Flood and drought resistant crop varieties

Indigenous and endogenous innovations against heavy rainfall and drought

Mobile gardens

Developing climate resilient alternative and additional livelihoods in agricultural areas (with the help of MO information and technologies from the Philippine Rice Research Institute

Post Ketsana (2009), Post-Monsoon Rains 2011, 2013: Missing Rivers, Informal settlements and links to the Metro-Weather Platform
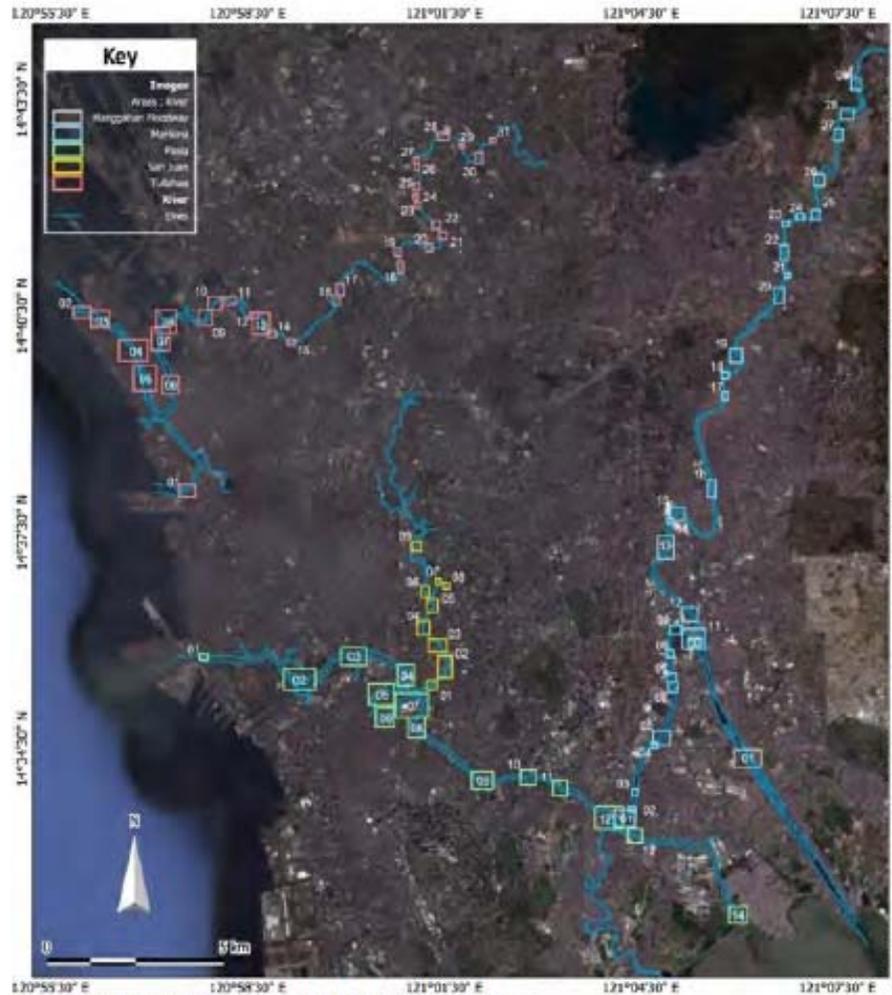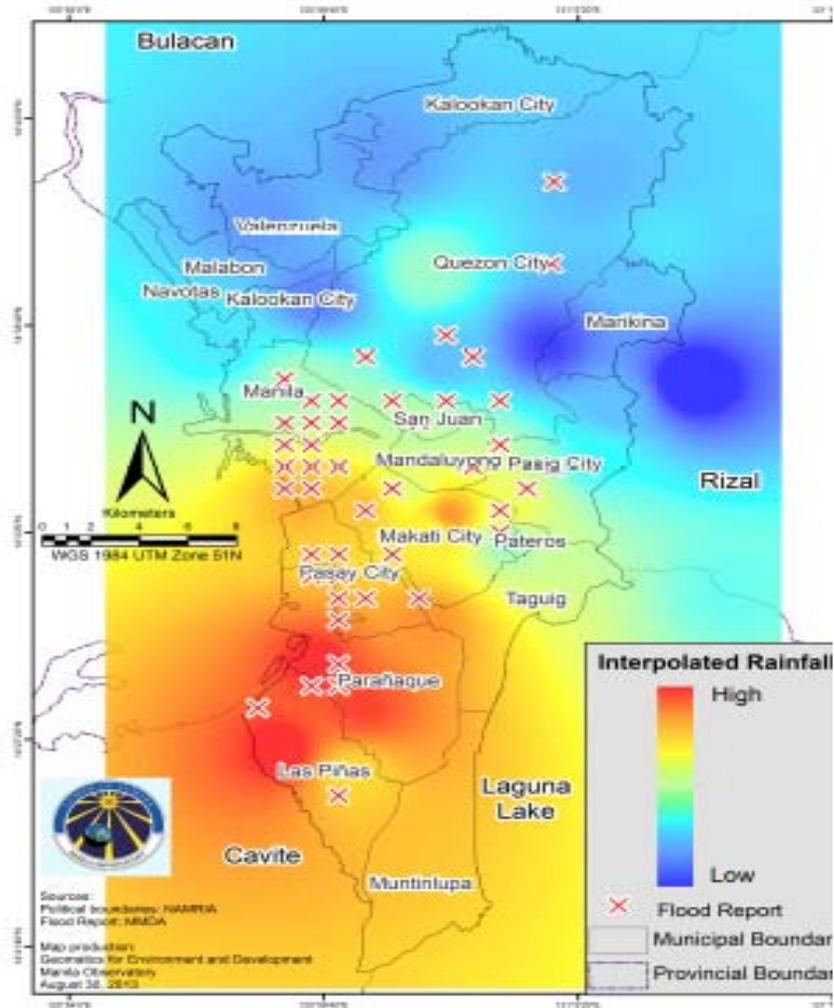

Figure IV.4. Constrictions in Metro Manila's Major Rivers

Siringan (UPMSI and MO), 2012

12 Steps to Mainstreaming Climate Change Adaptation (CCA) and Disaster Risk Reduction (DRR) in Development Planning: A Practitioner's Perspective

1
- Identify climate-related hazards
- Use climate projections; if absent, use climate trends
- Check PAGASA or local scientific institutions for local climate data
- To identify other hazards: check PHIVOLCS for geophysical hazards, MGB for rainfall-induced landslides, and other development analysis from government agencies and from Universities and Colleges

2
- Identify elements exposed to the climate –related hazards
- Identify sectors exposed to the climate –related hazards
- Identify elements and sectors exposed to geophysical and other natural hazards and to human-induced hazards

3
- Determine the vulnerability of each sector and element at risk to climate-related hazards and to other forms of past, current and immediate and future hazards
- Use vulnerability assessment tools

4
- Determine the coping (for DRR) and adaptive (CCA) capacity of your constituency
- Use asset-based mapping tools (assess social, economic, physical, environmental, and institutional capacities and assets)

5
- Determine how the changing climate will affect each exposed sector and element given specific vulnerabilities and adaptive capacities (for CCA)
- Determine how the changing climate will interact with other forms of hazards to affect your exposed sectors
- Determine how current climate and weather-related hazards alongside geophysical, ecological and other hazards will affect your exposed sectors (for DRR)
- Use influence diagram/tools
- Ask the help of and work with scientists in your area

6
- Ask further help from and work with the scientific community in the translation of climate projections into probable impacts.

7
- Determine what climate-related (for CCA) and disaster risk-related vulnerabilities you want to reduce and what coping (for DRR) and adaptive (for CCA) capacities you want to enhance vis a vis the projected climate hazards (for CCA) and the current hazards (for DRR)

8
- Identify specific programs, projects and activities (PPA) that will help reduce vulnerabilities and develop adaptive capacities (for CCA) and coping capacities (for DRR)

9
- Ascertain whether such actions are also contributing to your other development goals. Analyze benefits and constraints
- Prioritization of PPAs

10
- Identify Performance Indicators, Capacity Building Needs, Policy Requirements, Supplies Needed, Implementing Agency, Time frame Budget Needed

11
- Identify budget

12
- Transfer data, information, analysis produced into the AIP and other planning and budgeting templates
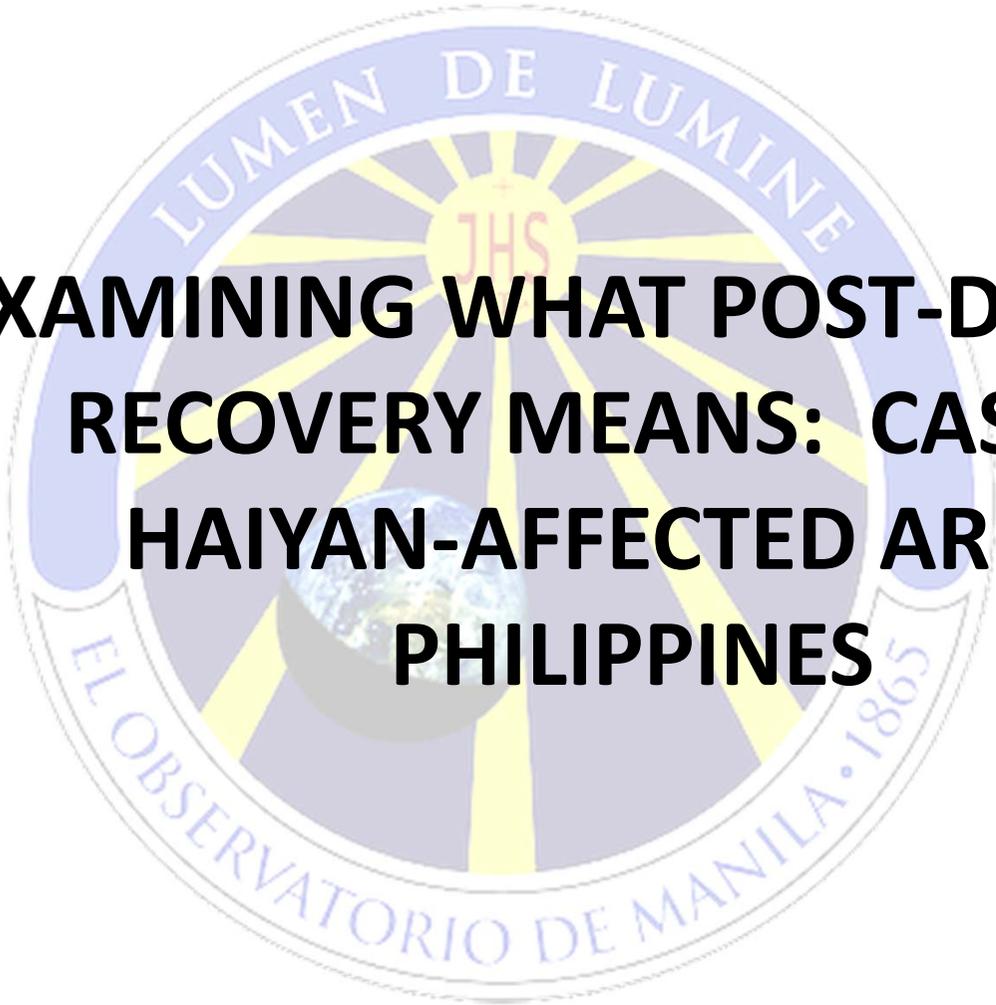
EXAMINING WHAT POST-DISASTER RECOVERY MEANS: CASE OF HAIYAN-AFFECTED AREAS PHILIPPINES
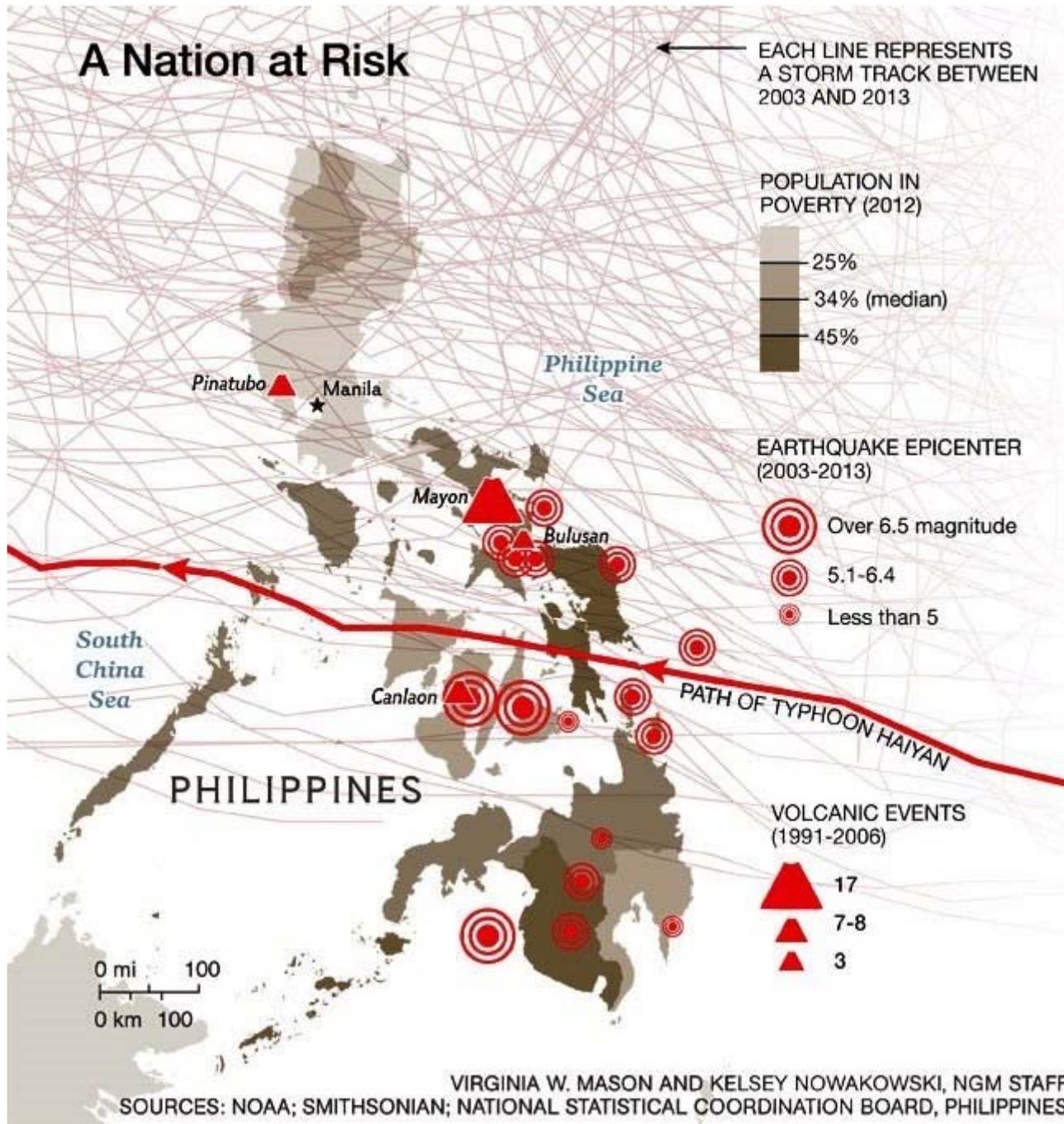
Poverty Incidence Among Population, Full Year 2012

2012 (in percent)

- <= 15
- 15.1 – 30.0
- 30.1 – 45.0
- 45.1 – 60.0
- > 60

A Nation at Risk

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POPULATION IN POVERTY (2012)

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34% (median)
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Pinatubo — Manila ★

Philippine Sea

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South China Sea

Canlaon

PATH OF TYPHOON HAIYAN

PHILIPPINES

VOLCANIC EVENTS (1991-2006)

17
7-8
3

0 mi   100
0 km   100

VIRGINIA W. MASON AND KELSEY NOWAKOWSKI, NGM STAFF
SOURCES: NOAA; SMITHSONIAN; NATIONAL STATISTICAL COORDINATION BOARD, PHILIPPINES

Post- Disaster Recovery Coordination

TRANSITION FROM NDRRMC TO OPARR

Relief & Response Clusters to Rehabilitation & Recovery Clusters

Relief & Response
- Shelter
- Protection
- Nutrition
- Health
- Education
- WASH
- CCM
- Early Recovery & Livelihood
- Food Security & Agriculture

Rehabilitation & Recovery
- Resettlement
- Social Services

- Infrastructure
- Livelihood
- Support

Comprehensive Rehabilitation and Recovery Plan (OPARR): Objectives

- To restore, rehabilitate or reconstruct damaged infrastructure necessary to sustain economic and social activities in the affected areas;
- To repair houses or rebuild settlements and basic community facilities and services that are more resilient to natural calamities;
- To restore the peoples' means of livelihood and continuity of economic activities and businesses; and
- To increase resilience and capacities of communities in coping with future hazard events.

GOVERNMENT'S CLUSTER FRAMEWORK

Presidential Assistant for Rehabilitation & Recovery (PARR)

Infrastructure Cluster
Cluster Head: DPWH

Livelihood Cluster
Cluster Head: DTI

Resettlement Cluster
Cluster Head: HUDCC

Social Services Cluster
Cluster Head: DSWD

Support Cluster
Cluster Head: NEDA & DBM

Local Government Units, Civil Society, Private Sector, Development Partners and Other Stakeholders

Recovery Plan

Comprehensive Rehabilitation and Recovery Plan (CRRP)

| Infrastructure Cluster Plan | Resettlement Cluster Plan | Social Services Cluster Plan | Livelihood Cluster Plan | Support Cluster |

Local Government Rehabilitation and Recovery Plans (LRRPs)

Private Sector/Development Partners

Baseline Data from
PDNA, RAY, NGAs, LGU

INFRASTRUCTURE CLUSTER PLAN

✓ *Repair/Rehabilitate/Reconstruct the following:*

- 116.32 km of national roads
- 22 national bridges
- 6 airports
- 43 Ports
- 13,406.17 km of conductors/powerlines
- 19,648 classrooms
- 32 SUC facilities
- 153 provincial/city/municipal halls

- 859 barangay halls
- 50 Day Care Centers
- 1,867.48 hectares covered by communal irrigation systems
- 132 public markets
- 315.41km of farm-to-market roads
- 76 facilities for water districts
- 38 halls of justice
- 41 Tourism facilities

SOCIAL SERVICES CLUSTER PLAN (1/2)

✓ *Implement and provide the following:*

- 135,135 students provided college scholarship grants
- 20 SUCs with damaged equipment and instructional materials assisted
- 6,377,842 students provided textbooks
- 434,835 students given supplemental feeding
- 517 computer packages
- 176,522 households provided water disinfectant
- 232 midwives deployed
- 582 patients provided health services and medicines
- 115,435 pregnant women given delivery kits

SOCIAL SERVICES CLUSTER PLAN (2/2)

✓ *Implement and provide the following:*

- 197 weighing scales and 197 height boards distributed
- 500,000 learning kits
- 16,807 hectares of mangrove, and 29,366 hectares of forest land rehabilitated
- 362 hectares for agroforestry development
- 966,341 families including 1,075 families from IP communities provided shelter assistance
- 35,164 farmers with insurance subsidy
- 77,739 food packs distributed
- 171 LGUs assisted in the formulation of Comprehensive Land-use Plan (CLUP)

RESETTLEMENT CLUSTER PLAN

✓ *Implement and provide the following:*

- Construction of 205,128 disaster-resilient housing units
- Safe and suitable resettlement sites identified and acquired
- Construction of 537 school buildings
- Construction of 202 multi-purpose covered courts;
- Provision for sustainable livelihood opportunities in new settlement sites.

LIVELIHOOD CLUSTER PLAN (1/2)

✓ *Implement projects that will assist the following:*

- 6,068,300 individuals including 705,495 farmers through expansio of food and income base, improvement of coconut-based farming systems, rehabilitation of abaca industry, and development of Regions IV-B, VI, VII, and VIII as "fruit bowl"
- 98,684 fisherfolk through provision of boat and fishing gears, rehabilitation of mariculture parks and seaweeds farming, development of the *Tilapia Industry*, and strengthening fisheries management and governance through an Ecosystem Approach.

LIVELIHOOD CLUSTER PLAN (2/2)

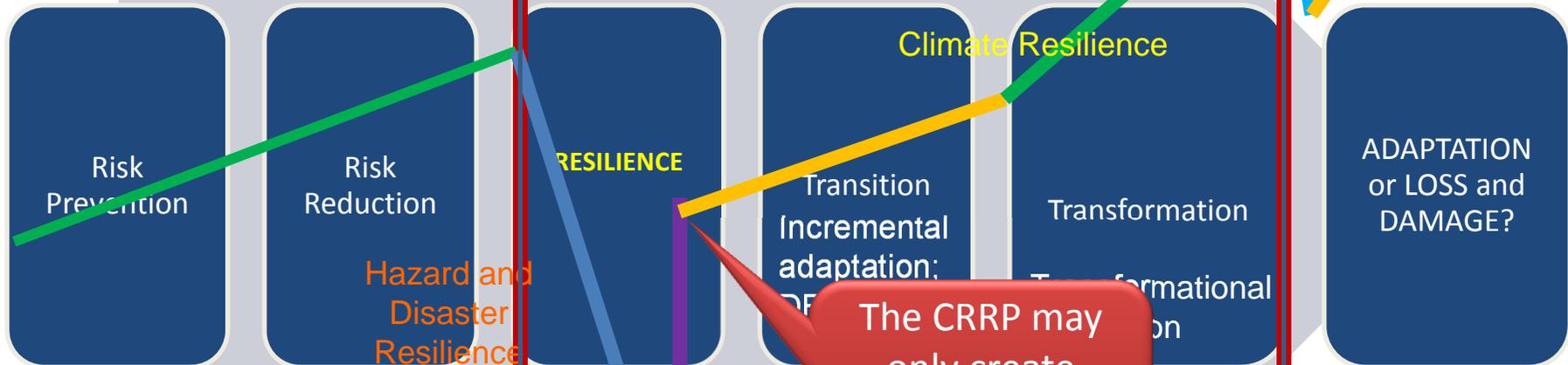✓ *Implement projects that will assist the following:*

- 32,359 MSMEs through establishment and strengthening of industry clusters using the value-chain approach; identification of market linkages; provision of affordable and accessible financial services; and creation of business-enabling environment; and
- 50,000 individuals through VocTech skills training; and at least 85 LGUs through capacity development in local employment promotion and local economic development.

HAZARD

HAZARD

Sustainable development

OWG- 7 CONCLUDING STATEMENT SDG

Creative restoration

Climate Resilience

Risk Prevention

Risk Reduction

RESILIENCE

Transition Incremental adaptation;

Transformation

ADAPTATION or LOSS and DAMAGE?

Hazard and Disaster Resilience

Disaster Resilience

The CRRP may only create outcomes for this point

UNISDR's PROPOSED ELEMENTS

MARK PELLING'S ADAPTATION to CLIMATE CHANGE FROM RESILIENCE TO TRANSFORMATION

POST-DISASTER RECOVERY WILL MEAN...

- **Avoid cascading disasters**

i.e., Characterizing hazards and reduce exposure to these hazards

Weng Daquilanea

POST-DISASTER RECOVERY WILL MEAN...

- **Attention to the current and future hazards accompanying climate change and its uncertainties**

POST-DISASTER RECOVERY WILL MEAN…

- **Avoid cascading disasters**

i.e, Protection for the vulnerable

jbercilla/Christian Aid

POST-DISASTER RECOVERY WILL MEAN...

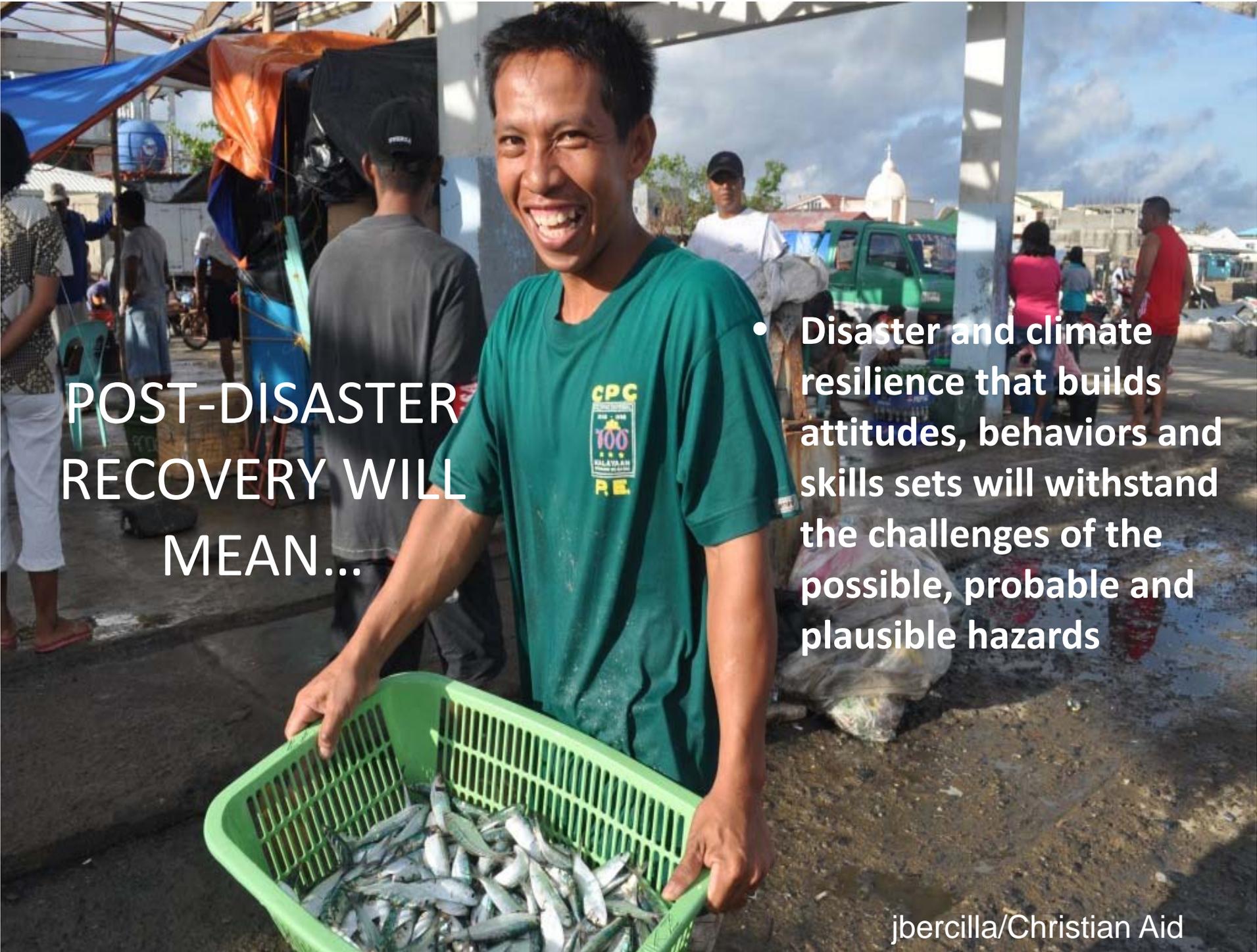- **Addressing vulnerabilities is key to rehabilitation and recovery**

Weng Daquilanea

POST-DISASTER RECOVERY WILL MEAN...

- **Getting people out of harm's way**

NOTICE TO THE PUBLIC

40.0 METER EASEMENT FROM SHORELINE IS A

BUILD ZONE"

http://www.asamnews.com/2014/05/11/tensions-rise-for-homeless-typhoon-surivors-in-philippines/

POST-DISASTER RECOVERY WILL MEAN…

- **Disaster and climate resilience that builds attitudes, behaviors and skills sets will withstand the challenges of the possible, probable and plausible hazards**

jbercilla/Christian Aid

POST-DISASTER RECOVERY WILL MEAN……

- **Attention to non-economic losses and damages**

i.e., loss of ecosystem services

NIACDEV And NFR

jbercilla/Christian Aid

POST-DISASTER RECOVERY WILL MEAN...

- Attention to non-economic losses and damages

Ie, loss of culture

jbercilla/Christian Aid

POST-DISASTER RECOVERY WILL MEAN...

- **Attention to non-economic losses and damages**
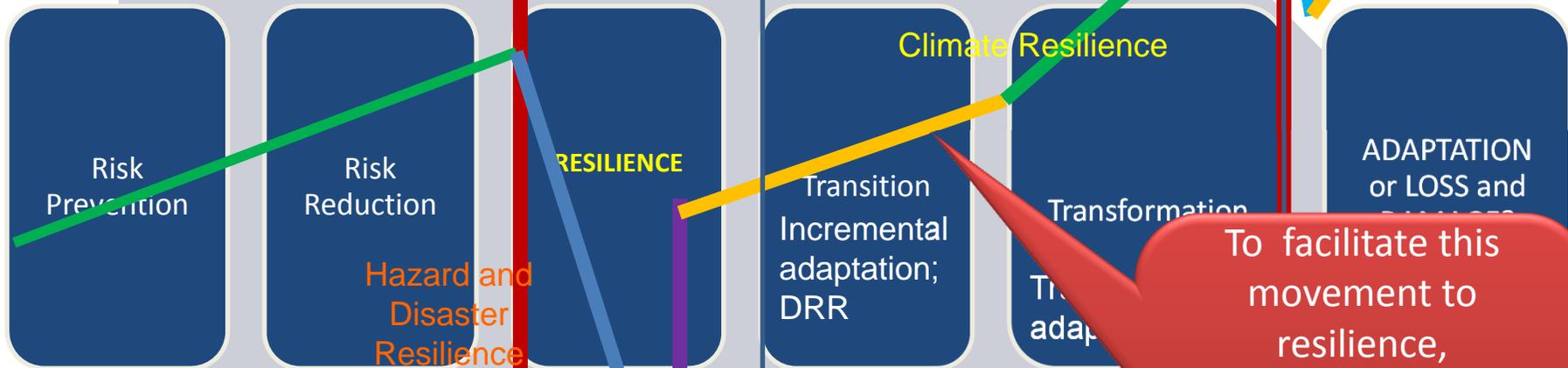
Ie, human dignity and quality of life

Weng Daquilanea

Translating the Theory to Practice Christian Aid, Haiyan (Samar and Leyte)

IDEAL State of Recovery

Poverty Threshold

Pre disaster

VULNERABILITY REDUCTION WILL BE KEY TO RESILIENCE AND DEVELOPMENT

Provide the scaffold for further recovery, resilience and development

Disaster response prevents or must prevent cascading disasters

Critical phase of recovery

Time
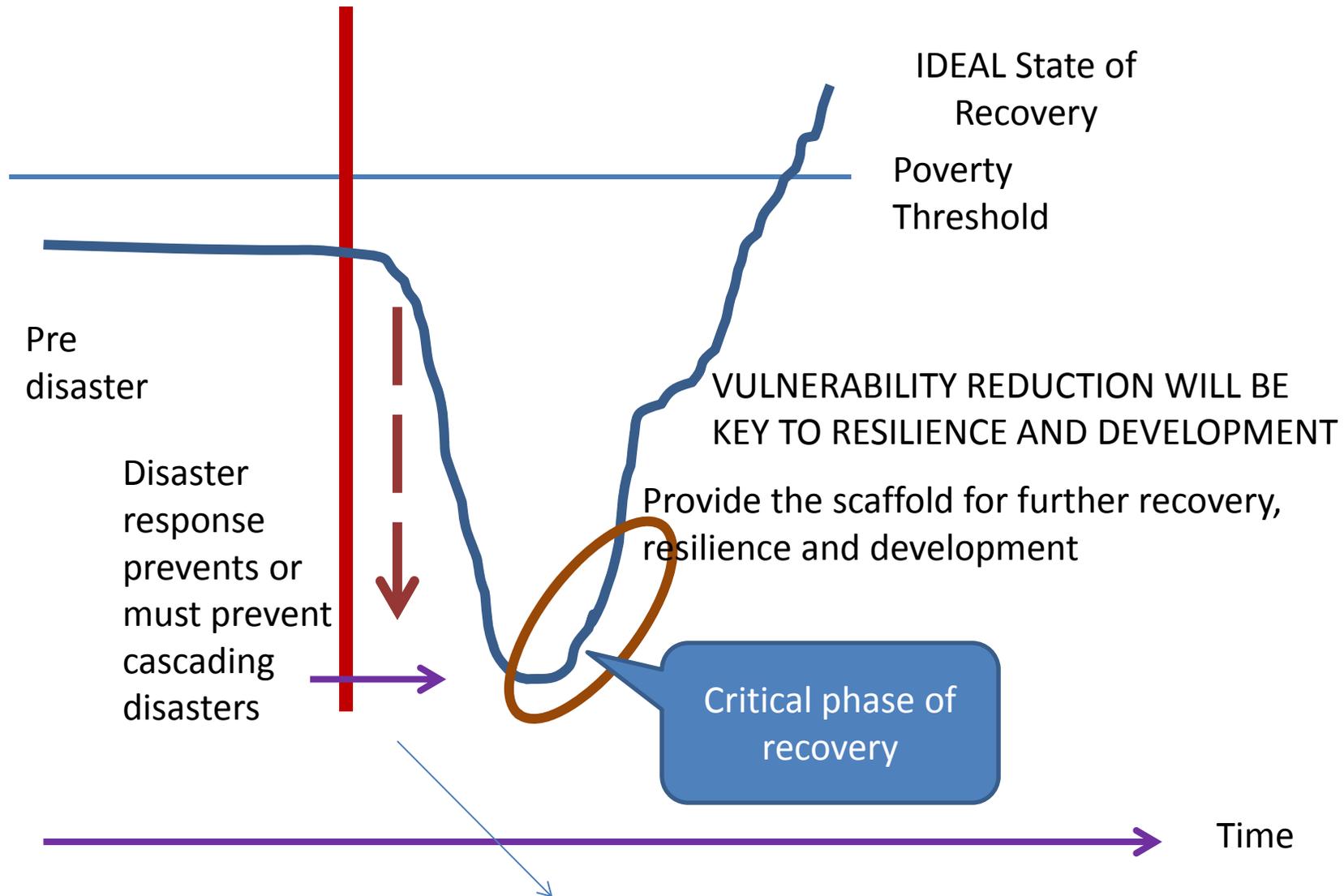
Operational Translation
Christian Aid, Haiyan Recovery, 2014

Objectives of the humanitarian action using disaster resilience lens	Operational Targets	Approach	Possible Core Intervention	TIME FRAME
Avert loss of lives and assets from cascading disasters	HHs eat at least 3 times a day (note: quantity, quality, nutritional content need to be discussed)	HH level food production HH financial mgt; prevent HH "leaky buckets"; NOTE: suggestions outside of discussion with CCI and CERD – Food assistance or food subsidy (via cash transfer)	HH container or vegetable gardening, etc General orientation on HH financial mgt (focus on budgeting for food, etc) with accompanying poster or booklet that will help them do basic budgeting NOTE: suggestions outside the discussion with CCI and CERD for increase in cash transfer for food needs or food packs for the most vulnerable	Within 6 months
Restoration of functionality	HHs earn cash or non-cash income that will allow them resources to daily access food and address other basic needs Reduce dependence on humanitarian aid	Facilitate the creation of livelihoods** with daily (preferred) or very short-term (max of 5 days and no longer than this) return on investment (ROI) NOTE: **climate and disaster resilient livelihoods	Cash transfer	6 months- 1 year
Maintain capacity to achieve thriving livelihoods	The policy enabling environment and private and public sector support services facilitate the sustainability of HH livelihoods and participation in the enhancement of the local economy	Create an enabling environment that will support the resuscitation of HH livelihoods and facilitate 1)the entry of HH livelihoods to the local economy and 2) enhancement of the local economy	Advocacy for livelihood investments from the LDRRMF and development funds; provision of livelihood support services (ie from PESO see http://www.ble.dole.gov.ph/peso.asp and other institutions	Within 2 years