

A *LOOK* at *DISASTER* *RISK MANAGEMENT*

in the
Philippines



Photo credit: http://www.philippinecountry.com/philippine_news/year2006/milenyo_09-29-06.html

By: Romeo B. Santos, PhD Arch Eng
Associate Professor
College of Architecture
University of the Philippines

***International
Training Workshop for
Typhoon and Flood
Disaster Reduction***

5 - 9 May, 2008

National S & T

Center for Disaster Reduction
Taipei, Taiwan

Presentation Outline

1. *INTRO*
2. *The Philippine
DISASTER Fact
Sheet...*
3. *DISASTER SITUATION?
DISASTER PROBLEM: my
target*
4. *My
ORGANISATION, ...W
HAT CAN IT DO?*
5. *NOW,...what are we
doing... & plan to do
from hereon?...*
6. *CONCLUSION*



Photo credit: Guinsaugon 2008 International Conference Workshop: Dr. S.G. Catane, et.al.

PHILIPPINES Basic Data

- Population: 88.6 million (2008)
- Annual Population Growth rate = 2.3%
- Urban Population Growth = 4.9%
- Urban Population = 52%
- GDP = US\$1700+
- Land Area = 300,000+ sq. m.

PHILIPPINE DISASTER FACT Sheet

- ***Worlds 4th most accident prone*** country in the world
- Philippines located on the Pacific "ring of fire"- string of volcanic islands on the western edge of the world's largest ocean
- Philippines a natural laboratory for floods, typhoons, monsoon rains, earthquakes, volcanic eruptions, and landslides," (Source: Philippine Daily Inquirer
- 5 earthquakes daily, caused mostly by tectonic plate movements (Pacific & Eurasian Plates), though most barely perceptible
- quakes also caused by the country's 22 active volcanoes (total 220)
- Landslides, earthquakes, floods, typhoons (20/year), volcanic eruptions, liquefaction and other natural hazards killing occurring every year
- 500 killed every year

PHILIPPINE DISASTER FACT Sheet

- 2001 alone -317 disasters (U\$ 190million total damages)
- 5,809,986 Filipinos killed/injured from disasters or man-made calamities over a ten-year period (1992-2001)
- November 5, 1991, flashflood hit Ormoc City in Leyte, killing at least 3,000 people & destroying the homes of 50,000 others
- August 3, 1999, heavy torrential rains caused landslide, killed 58 people, buried over 100 houses at Cherry Hills Subdivision in Antipolo City
- June, 1991, Mount Pinatubo, the century's second largest volcanic eruption, unleashed some 15 million tons sulfur dioxide into atmosphere, cooled the entire Earth by up to 0.6 degrees C
- September 29, 2006 Friday, MILENYO- strongest typhoon to hit Metro Manila directly in 11 years

Summarized Table of Natural Disasters in Philippines 1995-2007

	# of Events	Killed	Injured	Homeless	Affected	Total Affected	Damage US\$ (000's)
Drought	8	8	0	0	6,553,207	6,553,207	64,453
avg per event		1	0	0	819,151	819,151	8,057
Earthquake	21	9,580	13,051	3,985	2,205,841	2,222,877	844,885
avg per event		456	621	190	105,040	105,851	40,233
Epidemic	13	460	0	0	14,730	14,730	0
avg per event		35	0	0	1,133	1,133	0
Flood	72	2,716	570	500,841	10,886,298	11,387,709	449,756
avg per event		38	8	6,956	151,199	158,163	6,247
Insect Infestation	2	0	0	0	200	200	925
avg per event		0	0	0	100	100	463
Slides	25	2,604	381	23,012	287,270	310,663	12,258
avg per event		104	15	920	11,491	12,427	490
Volcano	20	2,996	1,188	79,300	1,545,154	1,625,642	231,961
avg per event		150	59	3,965	77,258	81,282	11,598
Wave / Surge	5	69	0	5,250	1,012	6,262	60
avg per event		14	0	1,050	202	1,252	12
Wild Fires	1	2	0	0	300	300	0
avg per event		2	0	0	300	300	0
Wind Storm	243	35,920	29,185	6,288,061	79,998,505	86,315,751	9,034,725
avg per event		148	120	25,877	329,212	355,209	37,180

Source: "EM-DAT: The OFDA/CRED International Disaster Database, www.em-dat.net - Université catholique de Louvain - Brussels - Belgium"

Typhoons top the most common of disasters



Photo credit: <http://www.phschool.com/science/planetdiary/archive05/hurr1082705.html>

Milenyo – a typhoon of notable proportion



Photo credit: http://www.philippinecountry.com/philippine_news/year2006/milenyo_09-29-06.html

Lives are caught upside down in a typhoon disaster



Photo credit: http://www.philippinecountry.com/philippine_news/year2006/milenyo_09-29-06.html

Mt. Pinatubo – 2nd largest eruption of the century

7



Photo credit: http://en.wikipedia.org/wiki/Mount_Pinatubo

"There will always be disasters. There will always be impacts. But recent events are beginning to tell us that Disaster Risk Reduction is the key to mitigating the impacts, saving lives, and creating disaster-resilient and sustainable communities." --PDC Executive Director Dr. Allen Clark

<http://www.pdc.org/PDCNewsWebArticles/2006srpolicyforum/spforum.html>



Photo credit: <http://pubs.usgs.gov/fs/1997/fs113-97/>

Disaster doesn't come easy... it's always tough



Photo credit: http://en.wikipedia.org/wiki/Mount_Pinatubo

Ruined lives... ruined future...



Photo credit: <http://www.teachersdomain.org/resources/ess05/sci/ess/earthsys/lahar/index.html>

Target: *DISASTER & DEVELOPMENT*

While architects, engineers, planners, & builders have the task of developing secure & sustainable settlements, they are unwittingly but significantly instrumental in contributing to the five-fold increase of DISASTERS!! (C. Wamsler)

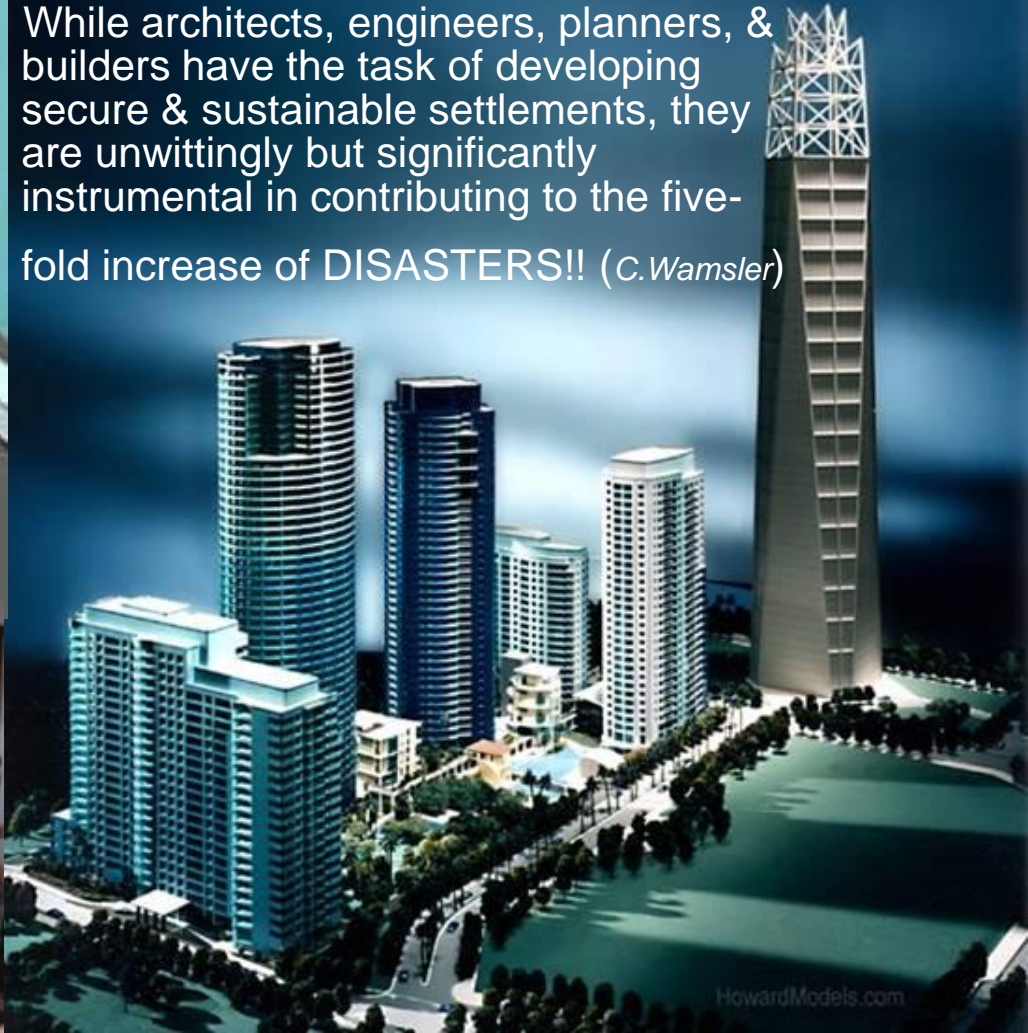


Photo credit: Rockwell Center, Makati: F. Sygui; Slum: A. Valenciano

***Rapid urbanization results to haphazard
development***

w/o

***good planning or no planning
at all ...***

While architects, engineers,
planners & builders have the
task of developing secure &
sustainable settlements, they
are unwittingly but significantly
instrumental in contributing to
the fivefold increase of
DISASTERS!! (C.Wamsler)



*Development can **increase** OR **decrease** vulnerability:
Disasters can **setback** development OR **provide**
development opportunities*

Photo credit: Rockwell Center, Makati; F. Sygui: NHA housing: A. Valenciano

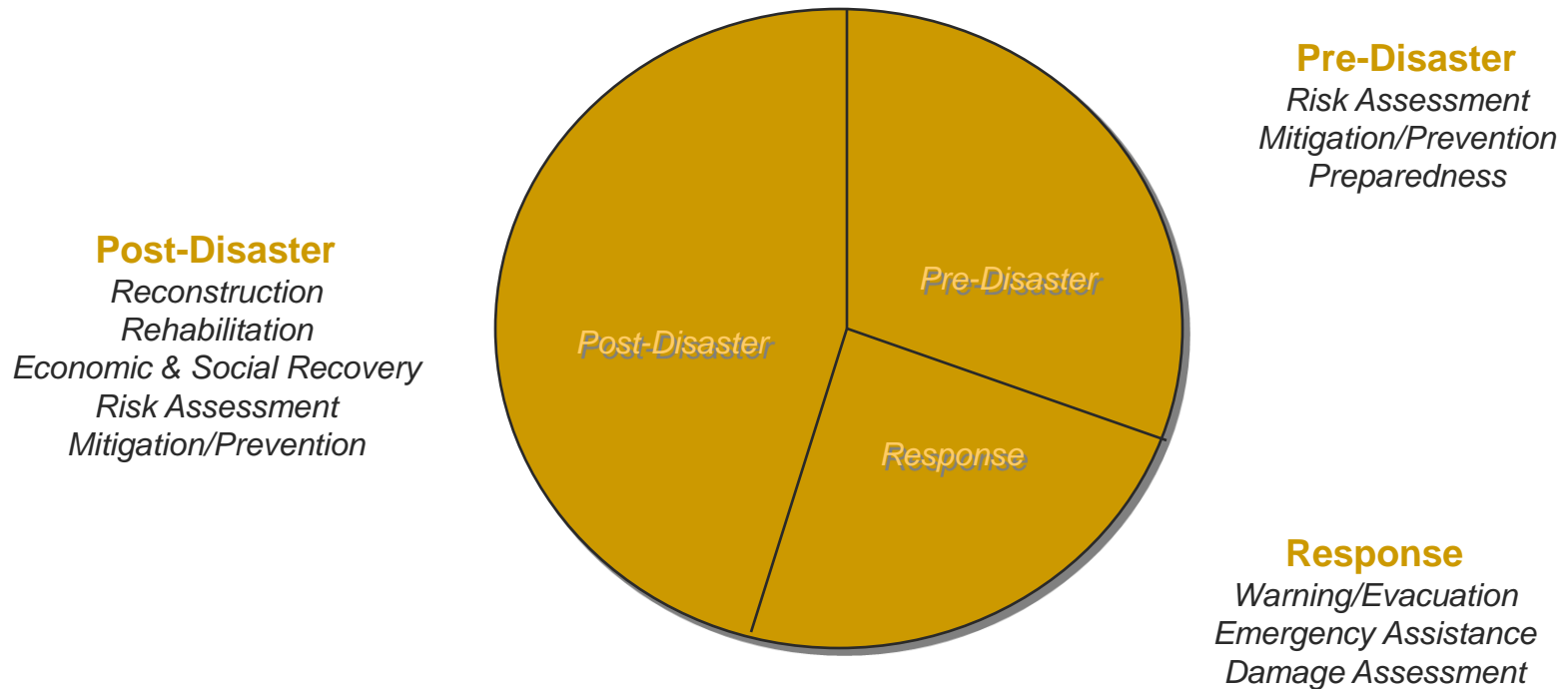
*Relationship between
development and
disasters must be
studied*



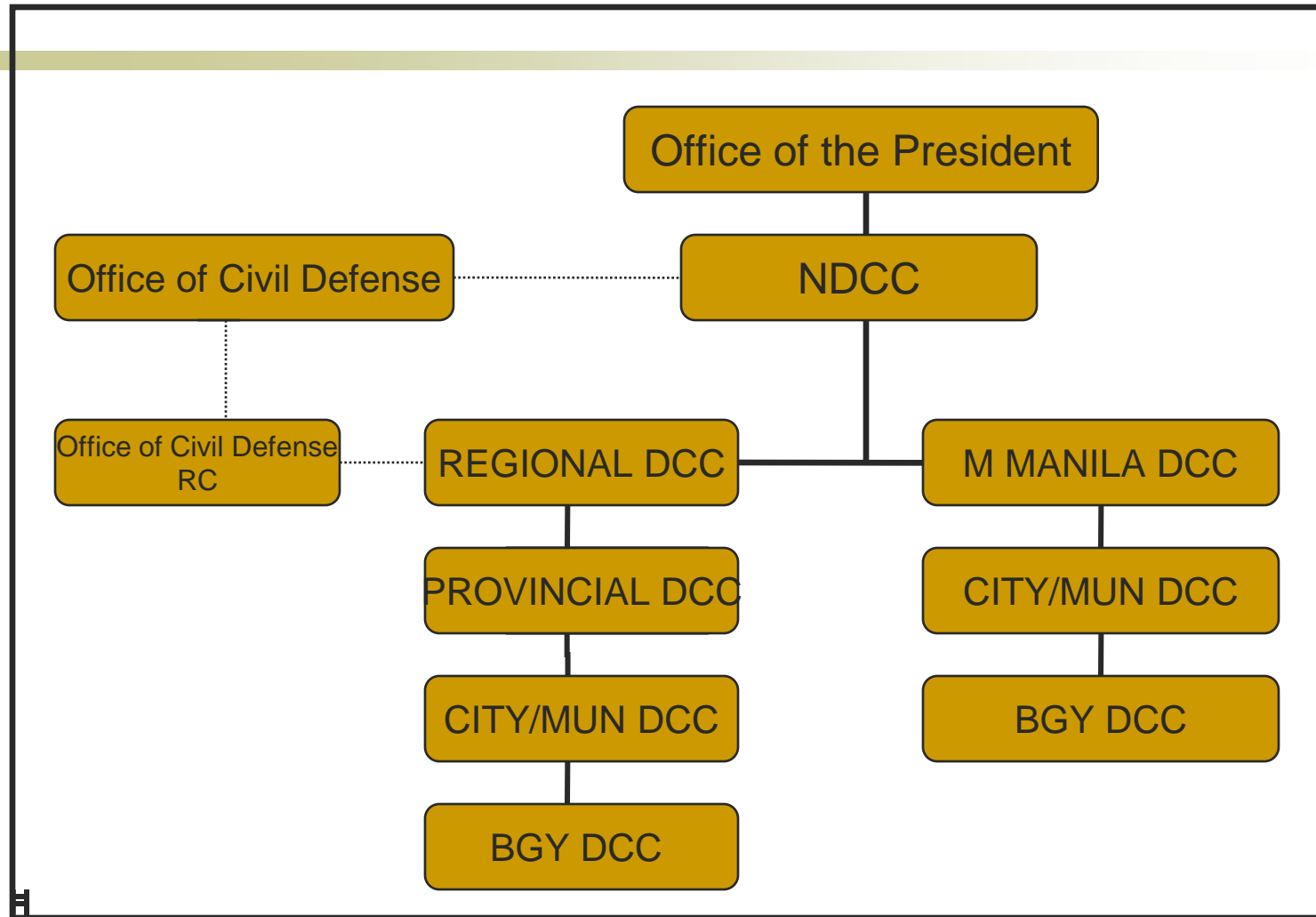
The Philippines has a long history & rich experiences in disaster management

- PD No.1566 (1978) – founded the NDCC as highest policy-making body on matters of disasters
- RA 7160: Local Government Code 1991- 2-5% calamity fund provision
- RA 8185 (1997): set aside 5% of est. revenue for disaster fund
- Current Programs –emergency preparedness & response program; disaster risk reduction program; advocacy on civil protection program; Human resource development program
- Strengths: established disaster coordinating councils at different levels of society; organizational strength
- Weaknesses: lack of funds; cultural idiosyncrasies—insurance aversion; lack of well trained rescue staff

Disaster Risk Management Cycle



ORGANIZATION of Disaster Coordinating Council



Guinsaugon fury ...so many broken lives



Photo credit: Guinsaugon 2008 International Conference Workshop: Dr. S.G. Catane, et.al.

[*Warning!.. beauty doesn't guarantee safety..*



*Photo credit: Guinsaugon 2008 International Conference
Workshop: Dr. S.G. Catane, et.al.*

Bitter memories enshrined forever in the heart....

1



Photo credit:<http://angtaongbato.blogspot.com/2006/06/from-my-field-notes-homonhon-and.html>

Rehab & recovery are not as fast as it should be...

7

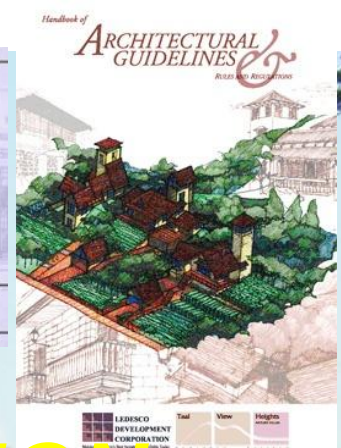


Photo credit: <http://angtaongbato.blogspot.com/2006/06/from-my-field-notes-homonhon-and.html>

Pedestrian-friendly Streetscape in a Tropical Business District



U.P. College of
Architecture



My ORGANISATION... vv. the DISASTER RISK MANAGEMENT issue... what can it do???

CASE-BASED STUDY OF THREE TOURISM-DEPENDENT
ISLANDS IN THE PHILIPPINES

*The Cases of Boracay Island, Aklan; Puerto Galera,
Oriental Mindoro & Coron, Palawan*

R. B. Santos, M. V. Tomeldan

**'Stand up to Katrina!' Learning from typhoon resilient
features of tropical vernacular houses in the
Philippines, Thailand, and South Florida, USA**
R. Santos, A. Abatte, M. Thitisawat

**U.P. College of Architecture/ University of Warmia-Mazury at Olsztyn, Poland (UWM-Department of
Real Estate Management and Regional Development), Joint Study Proposal: Studies on Urban &
Regional Development in Information and Communication World**

(<http://regionalgrowth.blogspot.com/>)

[

*'UHO' – – Urban Housing Observatory
U. P. College of Architecture*

*A Proposal for the Establishment of a
Sustainable Program of Research &
Development of Housing in the
Philippines.'*

*...DRM must be integrated as an
important field of instruction &
research...*

[NOW,.. *WHAT TO DO?...*]

- LOOK @ how the STRUCTURE of UPCA can be ALIGNED with DISASTER RISK MANAGEMENT study & establish LINKS with other ORGANISATIONS doing the same.
- FORMULATE a *SPECIFIC ACTION PLAN* to address the issue of *incorporating* DRM with research & instructions in **UPCA**

***'Stand up to Katrina!'* Learning from typhoon resilient features of tropical vernacular houses in the Philippines, Thailand, and South Florida, USA**

R. Santos¹, A. Abatte², M. Thitisawat³

1. Associate Professor, College of Architecture, University of the Philippines

rbsantos1@up.edu.ph

2. Associate Professor, College of Architecture, Urban and Public Affairs, Florida Atlantic University, USA, aabbate@fau.edu

3. Assistant Professor, College of Architecture, Urban and Public Affairs, Florida Atlantic University, USA, mthitisa@fau.edu

Abstract

Corresponding author: R. Santos

This paper is an extended abstract of an ongoing study^[1] on typhoon resilient features of tropical vernacular houses. The study aims to isolate the indigenous adaptive responses found in three types of vernacular architecture such as the (i) colonial and traditional houses in the Philippines, (ii) traditional houses in Southern Thailand, and (ii) rigid framed houses in South Florida, USA. Computational fluid dynamics (CFD) techniques will be employed to examine the behavior of building parts under cyclonic forces. The findings will inform future design decisions that may help improve our design of contemporary dwellings and therefore reduce damages during disasters.

Keyword: *computational fluid dynamics (CFD), cyclonic activity, tropical architecture, typhoon resilient properties, vernacular houses*

^[1] The study is an ongoing research project being done under a Fulbright Scholarship Grant awarded to the author. The main portion of the study will be accomplished as research-in-residence work in Florida Atlantic University College of Architecture, Urban and Public Affairs from September 12, 2008 to February 9, 2009 where the author is appointed Affiliate Associate Professor of Architecture during the period.

Katrina-like hurlers will become more common....

7

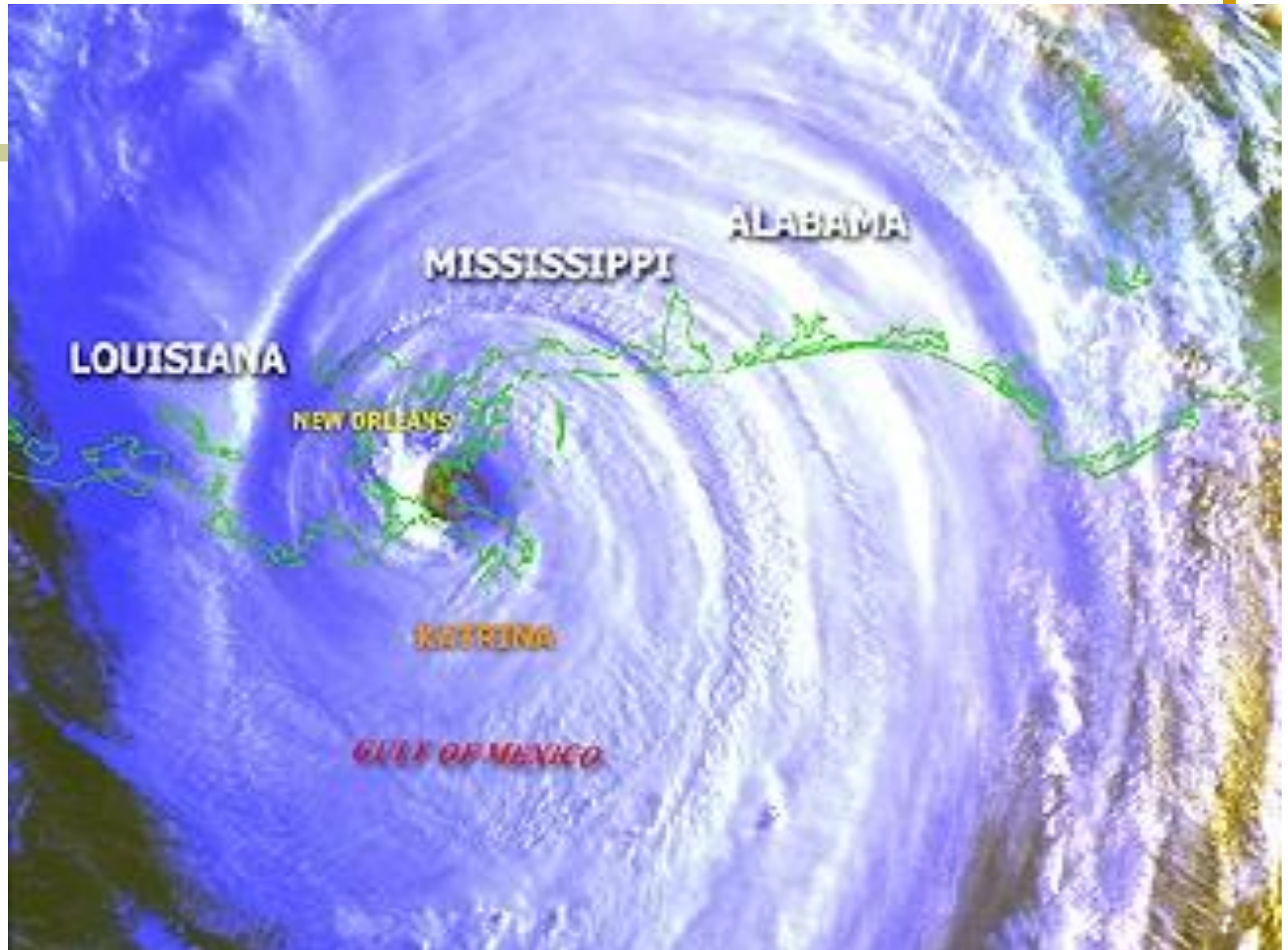


Photo credit: <http://www.phschool.com/science/planetdiary/archive05/hurr1090505.html>

***Studies in Housing should incorporate Disaster
Risk Management aspects***



Photo credit: <http://en.wikipedia.org/wiki/Batanes>

Studies in Housing should incorporate Disaster Risk Management aspects



Photo credit: E. Ozaeta

Indigenismo
Bahay Kubo

Mestisaje
Bahay na Bato

Colonial Houses VIGAN BAHAY NA BATO

*Studies in Housing should incorporate
Disaster
Risk Management aspects*



Photo credit: R. Olimpo

- One of the five World Heritage Sites found on the Philippines
- Inscribed on December 2, 1999 in the UNESCO World Heritage

Studies in Housing should incorporate Disaster Mitigation aspects



Photo credit: R. Olimpo

Points to Ponder about...

- Disaster Management community seems not unified in the use of concepts...

*...Disaster...risk...hazard...vulnerability...peril
..risk mgt...hazard mgt...hazard risk assessment
...risk/hazard/peril assessment....*

CONFUSION!!???... ➡ DISASTER!!!

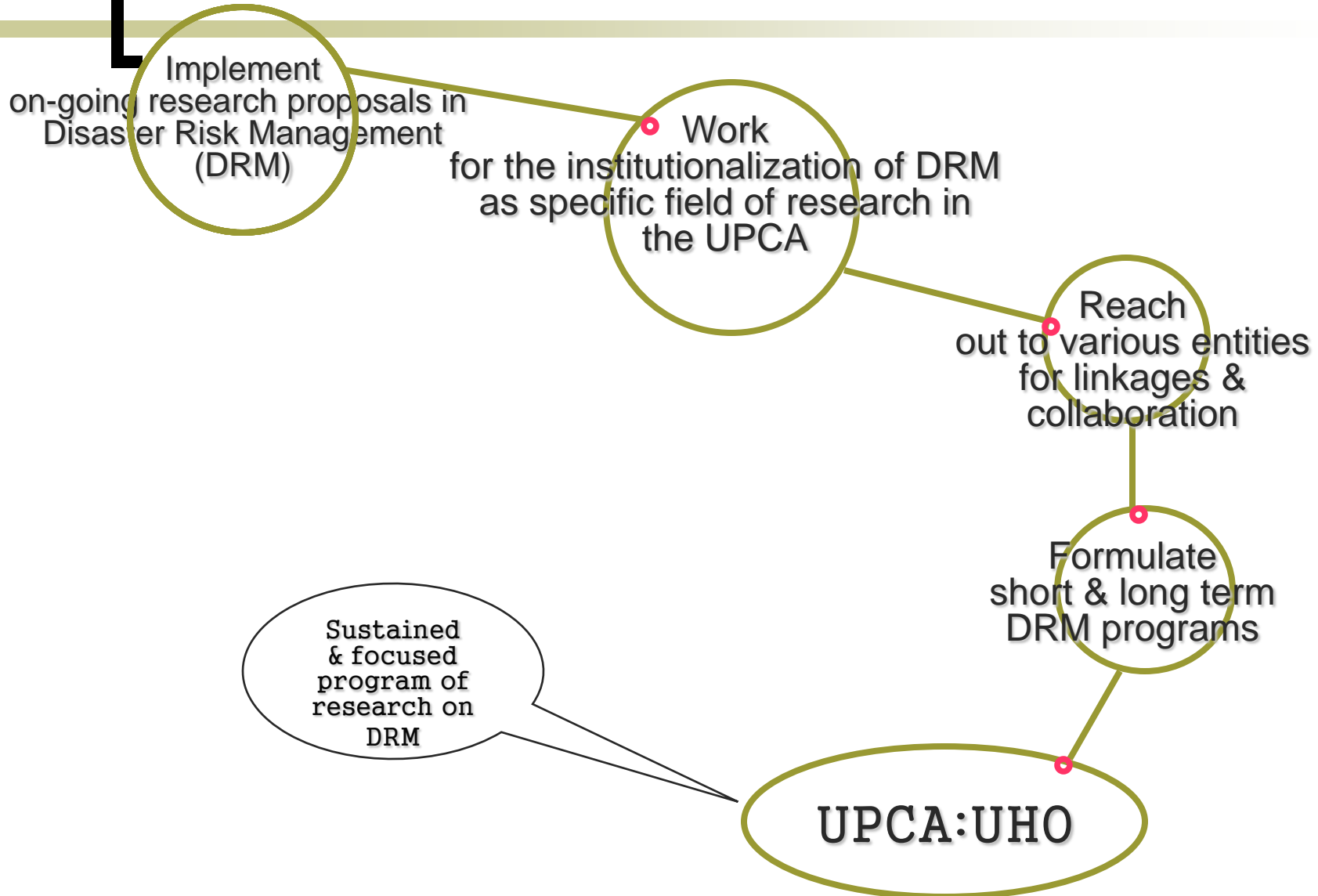
$$R = H \times V \times Lr$$

Hazard = *natural event*

Vulnerability = *result of human conduct, making an area, population w/c is exposed to hazards incapable of resisting or coping with effects of hazard*

Lr = *Lack of capability to cope*

SPECIFIC ACTION PLAN



Collaboration & Linkages with various sectors



**a partnership toward dynamic research on
development & disaster ...**

‘Manos a la Obra’

Present Linkages:

1. **ACARE** - association of local Architecture schools for research & education, regular forums.
2. **MEGACITIES Conference** - association of Universities in Asia, regular international conferences.
3. **Collaboration** with Florida Atlantic U for housing research.
4. **Inter University** collaboration- tie up with the College of Engineering, Asian Inst. of Tourism, others for research.
5. **Collaboration** with University of Warmia & Olsztsyn, Poland for urban mgt. research.

**U.P. College of Architecture/ University of Warmia-Mazury at Olsztyn, Poland (UWM-
 Department of Real Estate Management and Regional Development) Joint Study
 Proposal: *Studies on Urban & Regional Development in Information and Communication
 World* (<http://regionalgrowth.blogspot.com/>)**

Analysis and new techniques for knowledge exchange and cooperation between regions and cities. The action aims to put together research and researchers of different fields that work on regional and land use planning, urbanism, strategies in planning, computing and information systems to cooperate and build new network of knowledge; exchange knowledge to prepare cities and regions to new models of land management using modern technologies; build networks based on computer tools, portals, network architectures, multi-services supporting local communities; and build databases for experts that can be supportive of local municipalities but especially for sharing good practices between researchers and practitioners as well. The main achievements being envisioned will be progress in regional development using computing knowledge & knowledge models, and in the future, transforming into new network of international system of cooperation between scientists and local communities to solve major urban problems - making cities and regions more cohesive and better places to live in. This is a collaborative research among Prof. Anna Cellmer (UWM- Team leader), Prof RB Santos (U.P.- guest member) and other professors from different universities in Canada, Brazil and European Union countries for submission to COST (European Cooperation in the field of Scientific and Technical Research - <http://www.cost.esf.org/>) funding. (*Status: ongoing-research tie-up is under application for funding with COST*)



LOOK at what meeting of minds can DO!!



LONG BEACH, BORACAY ISLAND
Philippines

Photo credit: M. Tomeldan

Thank you
&
Good day



... IF what typhoons do is blow away our woes when they whip...then LIFE
would just be a WALK in the BEACH!...