



Republic of the Philippines
Department of Public Works and Highways

Strategies for Mitigating Water Related Disasters in the Philippines

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The Philippines

Geographical Characteristics

- 7,107 islands
- Mountainous
- Numerous fault lines
- Active volcanoes

Climate Characteristics

- Tropical climate
- Annual rainfall: 2,360 mm
(Manila)
- 20 typhoons affect the country every year



Damage Caused by Natural Disasters

- **Damage to property infrastructure and crops US\$1.90B**

- **Casualties**

Dead 11, 170

Missing 4,554

(1990-2003)

- **Major disasters**

Mt. Pinatubo (1991)

Ormoc (1991)

Southern Leyte (2003)

Quezon (2004)

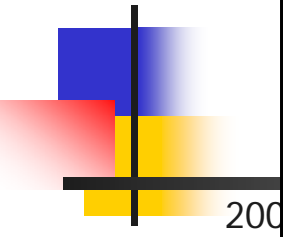
Southern Leyte (2006)



Lahar Flow / Sedimentation Problem



Mt. Pinatubo Eruption - June 1991



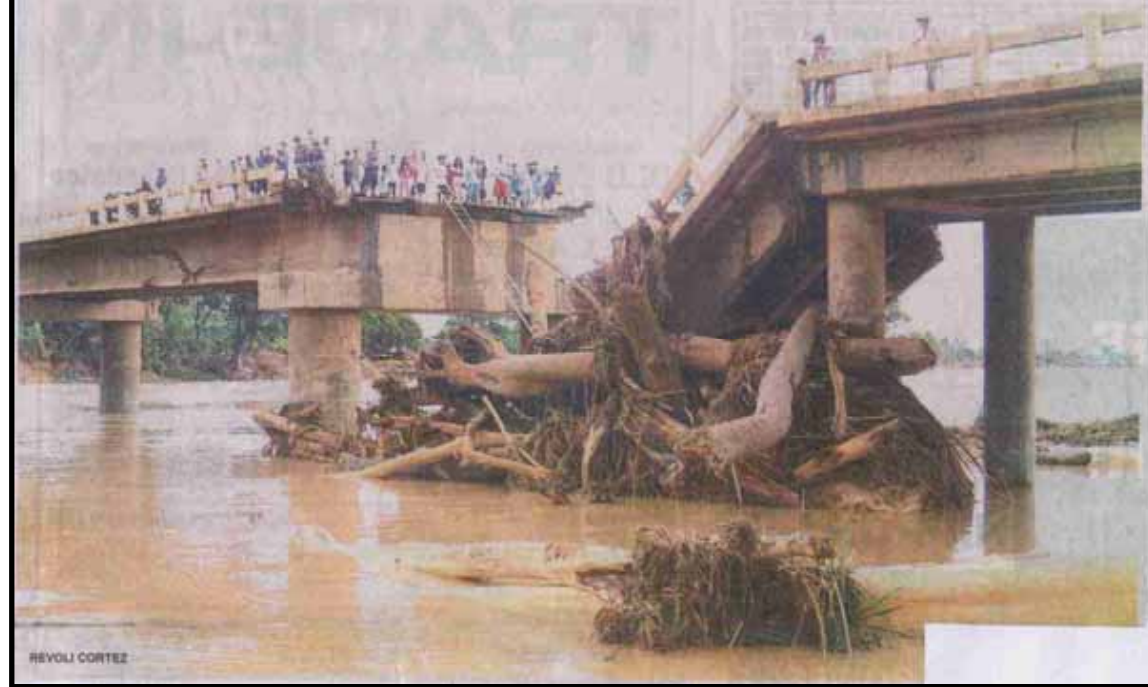
Floods in residential area



2006/4/13

Flood & Landslide

Disaster in Quezon & Aurora (2004)



St. Bernard, Southern Leyte (2006)

Landslide (2)



Issues to Address

- ✓ Serious conditions against water-related disaster due to geographic and climatic factors
- ✓ Many factors are producing lahar/sediment movement
- ✓ Many tragedies have occurred in the past 15 years
- ✓ People living in hazardous area is getting bigger in number

Others Issues to consider

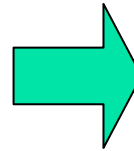
Flooding and erosion and sediment movement are major concerns because of the following:

- ✓ Encroachment of natural channels
- ✓ Deforestation of watersheds
- ✓ Indiscriminate garbage dumping into waterways
- ✓ Delayed relocation of people living in the hazardous area
- ✓ Insufficient budget for O & M
- ✓ Deficiencies in laws and regulations

Mitigation Measures

1. Structural Mitigation Measures

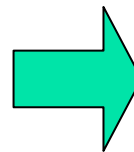
- Engineering interventions such as dikes, levees, retention ponds, sedimentation basins, sabo works, channeling, revetments, floodways, pumping stations, drainage facilities, etc.



Department of
Public Works and
Highways
(DPWH)

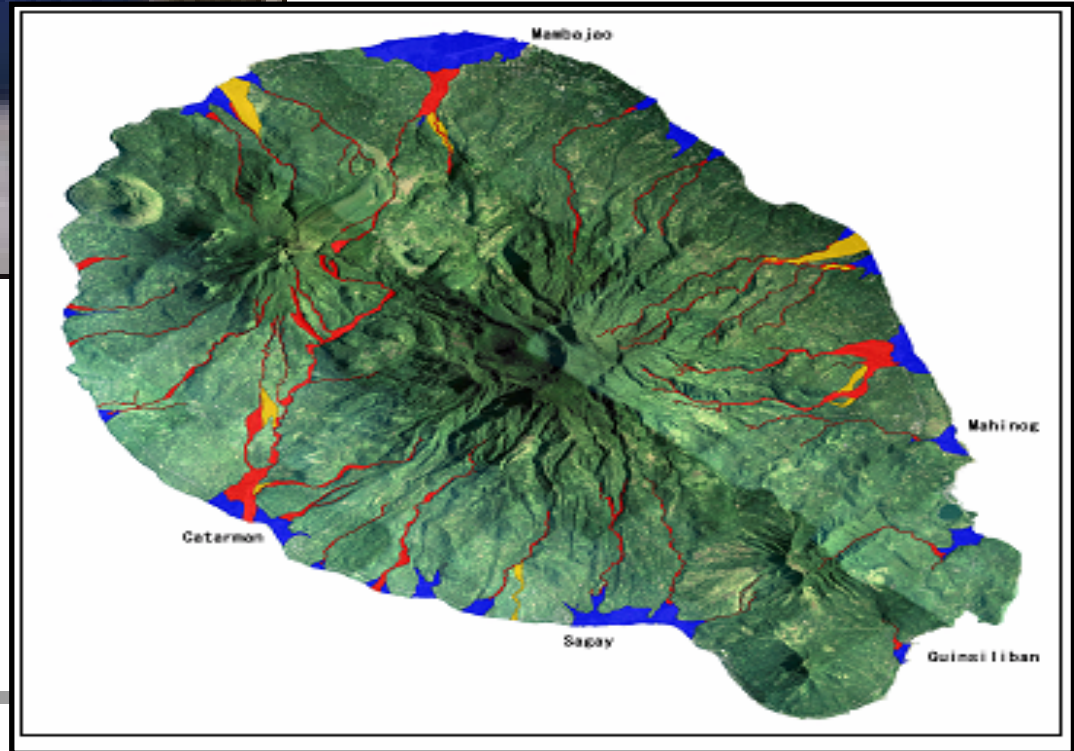
2. Non-structural Mitigation Measures

- Flood monitoring, information and warning system, evacuation system, hazard mapping, public awareness, land use planning, capacity building, etc.



PAGASA,
DENR, DPWH &
Other Govt.
Agencies / LGUs /
NGOs

Examples of Mitigation Measures



2006/4/13

Strategies for Water Related Disaster Mitigation (1)

- Conduct comprehensive floodplain management strategy :
 - ✓ Installation of Flood Forecasting and Warning System
- Mitigate flooding to tolerable levels in Metro Manila and major rivers with additional construction of flood mitigating structures.
- Adequate measure for other rivers facing serious conditions like Quezon & Aurora

Strategies for Water Related Disaster Mitigation (2)

- Implement sabo projects for the prevention or mitigation of sediment related disaster, debris flow, lahar flow and landslide
- Pursue proper O & M of flood control and drainage facilities
- Coordinate development of flood control and water resources projects
- Relocate and prevent informal settlers living along banks of rivers
- Strengthen the Flood Control and Sabo Engineering Center

Thank you for your attention!!



“Efficient measures towards effective water related disaster mitigation management..”