The DENR-MGB Geohazard Mapping and Assessment Programme (DENR-MGB GMAP)
Geohazards

The DENR-MGB GMAP
GEOHAZARDS

- Geological Phenomena
- Naturally Occurring
- Pose danger to people’s lives, properties, infrastructures and communities
- Cannot be totally prevented, but can be mitigated (impacts can be reduced)
Is the PHILIPPINES prone to GEOHAZARDS?

☞ a supermarket of geohazards
☞ a natural laboratory of geohazards
☞ the country that has experienced the most natural hazards in the twentieth century
Geohazards in the Philippines

Cherry Hills Subd, Antipolo, Rizal, 1999
La. Trinidad, Benguet, 2009
St. Bernard, Guinsaugon, SL 2006
Itogon, Benguet, 2009
Geohazards in the Philippines

Gen. Nakar, Infanta, Quezon, 2004

Iloilo, 2008

Angono, Rizal, 2009
Geohazards in the Philippines
Northern Luzon Earthquake, July 16, 1990 Ms 7.8
Geohazards in the Philippines
Mt. Pinatubo Volcanic Eruption, 1991

PYROCLASTIC FLOW

Lahar, Bamban, Tarlac

September 1991

Ash Fall, Clark Air Base
WHY IS THE PHILIPPINES GEOHAZARD-PRONE?

Geological Setting:
complex, tectonically active region

- Lies in Circum-Pacific Ring of Fire
  - 300 volcanoes, 23 active
  - 20 recorded earthquakes per day, 200 felt per year, 90 damaging for the past 400 years
WHY IS THE PHILIPPINES HAZARD-PRONE?

Geological setting: complex, tectonically active region

- Complex geologic evolution resulted in varying geomorphology:
  - Steep mountainous terrains (prone to landslides and erosion, and favorable for fast water flow downstream)
  - Vast plains (prone to flooding)
  - Coastal areas (prone to coastal erosion, storm surge and tsunami)
WHY IS THE PHILIPPINES GEOHAZARD-PRONE?

Meteorological setting: lies in a tropical region along the typhoon belt in the Pacific

- Average of 20 tropical cyclones per year
- Water saturation induces landslides
- Tropical cyclones bring about strong winds, floods, storm surges and other hydrometeorological hazards
- Tropical weather favors fast rock weathering and erosion
WHY IS THE PHILIPPINES GEOHAZARD-PRONE?

Aggravating factors:

- Deforestation and denudation
- Siltation of rivers and streams
- Clogging of waterways and poor drainage in urban areas
- Poor selection of settlement areas
- Improper construction of houses and buildings
The DENR-MGB Geohazard Mapping and Assessment Programme

- On-going national priority undertaking of the Department of Environment & Natural Resources (DENR)
- Implemented by the Mines & Geosciences Bureau (MGB)
- Emphasizes rain-induced landslide, flood and coastal hazards
OBJECTIVES

- Identify areas that are susceptible to various geologic hazards, particularly landslides and flooding
- Increase public awareness to lessen or mitigate negative impacts of natural disasters
- Identify possible relocation/resettlement sites – both for those affected and future development planning
WHAT HAVE WE DONE SO FAR?

Assessed and mapped municipalities/cities 1,557 out of 1,618 total (96%)

Field survey in various provinces as part of geohazard mapping and assessment
Produced geohazard maps (1:50,000 landslide and flood)

850 maps (86%) produced in digital and hardcopy printouts
WHAT HAVE WE DONE SO FAR?

Mapped and assessed coastal areas

2,385 line kilometers of shoreline
Conducted Information Dissemination Campaigns

Barangay Level

- Direct information or written advisories on geohazard threats issued to cities/municipalities and barangays for critical areas, right after the field survey.
Geohazard assessment report issued to Office of Municipal/City Mayor at the end of the field survey. The report summarizes the landslide and flood susceptibility of all barangays assessed in the municipality/city.
Provincial level

- Province-wide seminar-workshop on results of geohazard mapping and assessment, attended by all barangay captains, city/municipal and provincial officials, and public school teachers.
La Union governor presented with the geohazard maps of the province by the DENR-MGB Geohazard IEC team (Sept 2010)
Developed and distributed IEC materials on geohazards (posters, flyers, comics, VCDs, CDs)
Initiated the setting up of a community-based early warning system for landslides in municipalities/cities highly susceptible to landslides

1. Coordination meetings with LGUs and OCD re MOA2.

2. Conduct of special IEC.

3. Installation of sixteen (16) landslide warning signages.
The Little Kibungan Story (before and after Typhoon Pepeng)

BEFORE

AFTER

The DENR-MGB landslide warning signage site along the Pico-Lamtang Road in Puguis, La Trinidad, Benguet BEFORE and AFTER Typhoon Pepeng.
Little Kibungan Village in Barangay Puguis, La Trinidad, Benguet, as viewed downslope looking westward BEFORE and AFTER Typhoon Pepeng.
Alamin ang mga lugar na may peligro sa LANDSLIDE

- Active landslide area o gunitghung bato at lupa
- Overhang o glib ng bundok
- Limestone area o suka kung saan may mga kubba at ‘sineholes’
- ‘Roadcut’, bangkal at hukay
- ‘Dump’ at daring lugar ng gutno
- Kaysad sa glib at paanan ng bundok
- Plaanan ng bundok
- Mahina at nagko-collaspse na pondasyon
- ‘Nakataraw ang diho at bahi-bahi’
- Kasapitan sa kaskahan na maaaring gunito. ‘Tulisan at mga gamitng suka.
- Dasalang ng tubig