

REPUBLIC OF THE PHILIPPINES

International Centre for Water Hazard and Risk Management (ICHARM)

Public Works Research Institute (PWRI)

And in cooperation with Japan International Cooperation Agency (JICA)

**“Community Based Flood Warning and Flood Hazard Mapping in
Camiguin Island, Philippines”**

February 07 to 09, 2007

Presented by:

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PROJECT MANAGEMENT OFFICE

FLOOD CONTROL AND SABO ENGINEERING CENTER





- Just above the equator
- 7,107 islands
- Dry and wet season
- Average Annual Rainfall 2,360 mm
- Tropical Climate
- 20 Typhoons
- Fault System
- Active Volcano
- 421 Principal River Basins
- 18 Major River Basins



Probable Typhoon Tracks

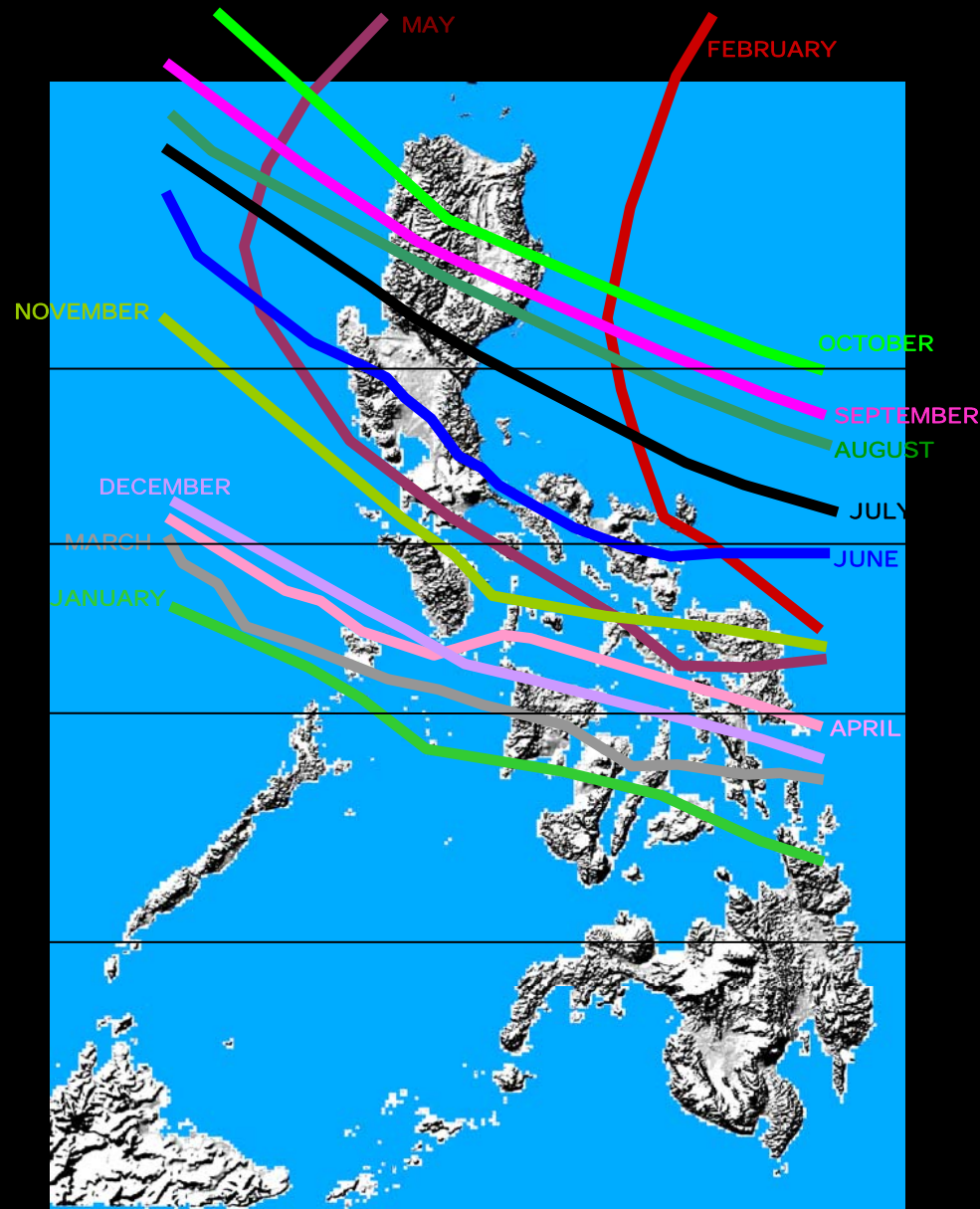
Very Frequent
32%

Frequent
16%

Frequent
19%

Less Frequent
7%

Rare
1%



Northern and Central Luzon

Southern Luzon

Northern Visayas

Southern Visayas and Northern Mindanao

Mindanao Island

Source: Study for the Preparation of Flood Control Manual for DPWH TSG, 2003

Contents

- Problems and Issues on the Government of the Philippines' Warning and Evacuation
- Non-structural measures for future implementation
 - JICA Study on Nationwide Flood Risk Assessment for Department of Public Works and Highways (DPWH)
- Community Based Flood Hazard Mapping
 - Camiguin Non-Structural Measure (Ungaged River Basin and Community Based)

Disaster Management: Disaster Coordinating Council

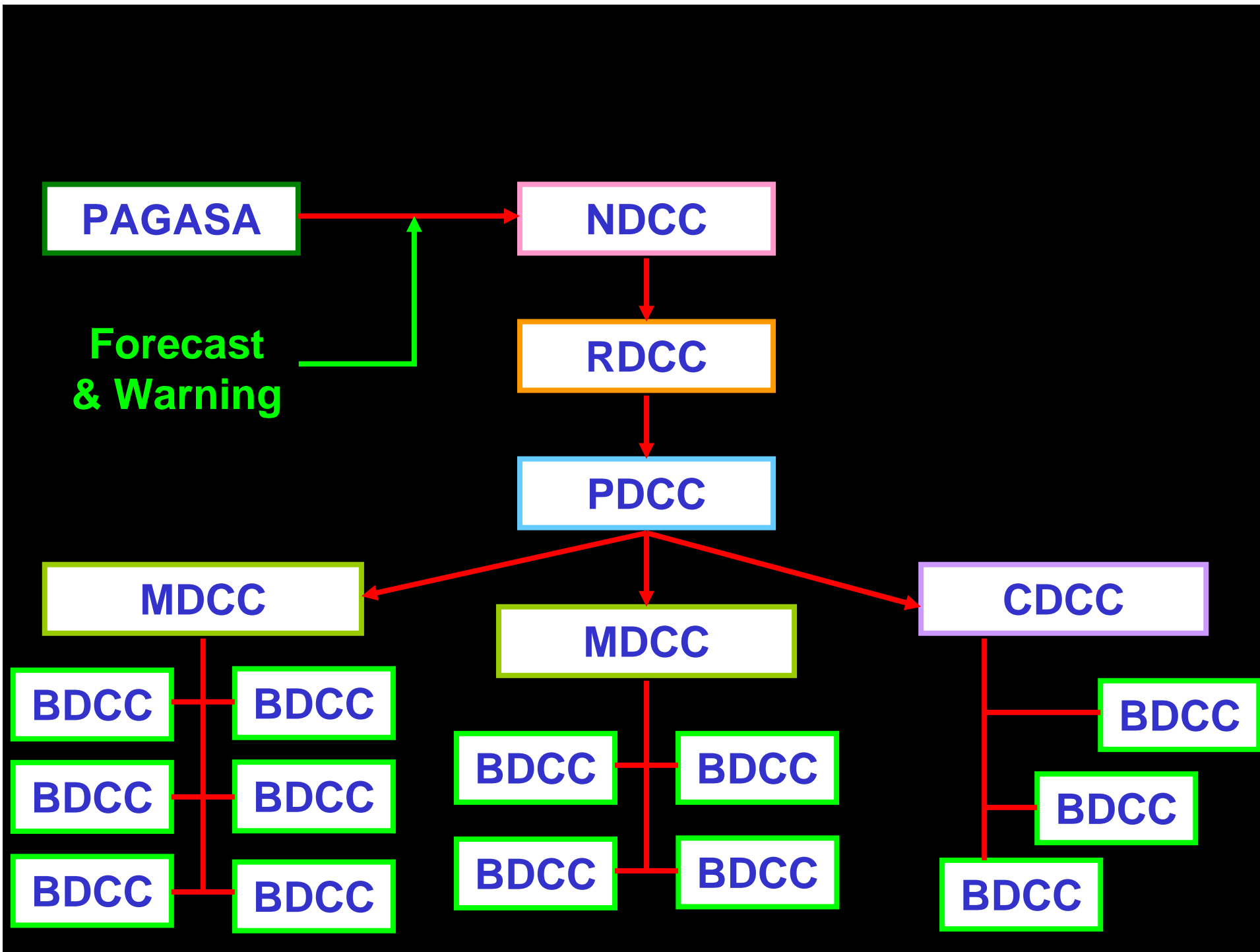
- **NDCC** – National Disaster Coordinating Council
- **RDCC** – 17 Regional DCC
- **PDCC** – 80 Provincial DCC
- **CDCC** – 113 City DCC
- **MDCC** – 1,496 Municipal DCC
- **BDCC** – 41,956 Barangay DCC

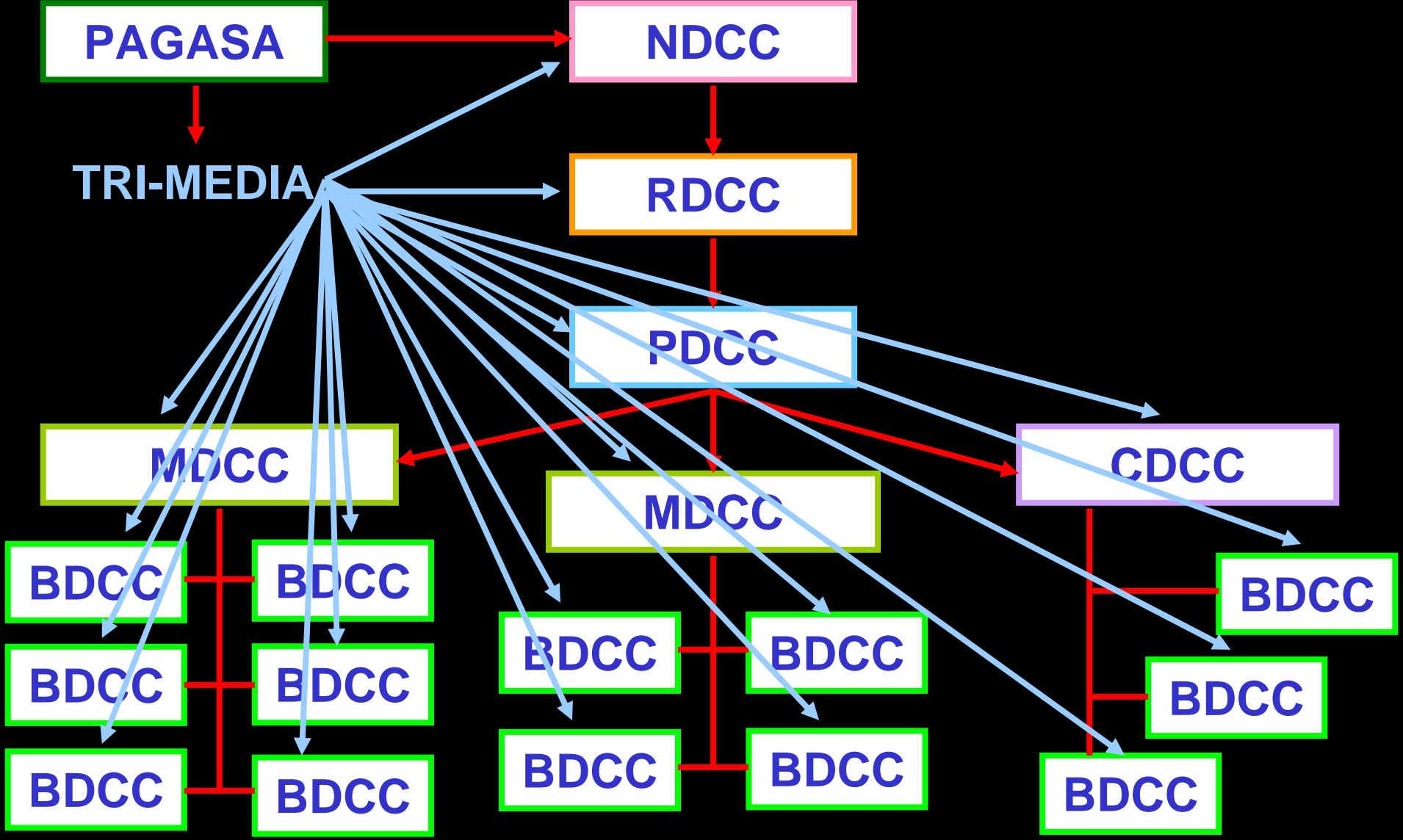
Flood Management

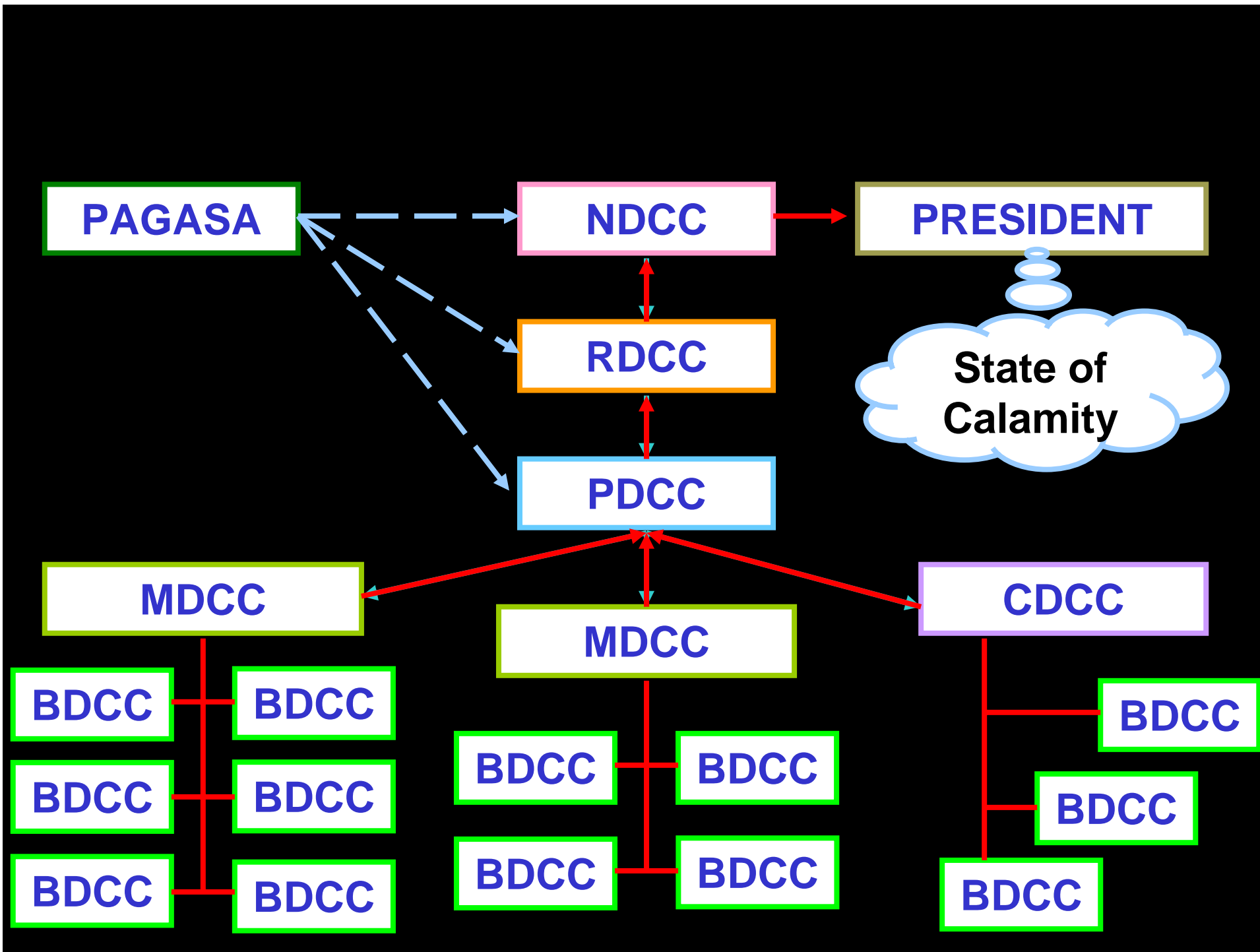
NDCC is the highest policy making, coordinating & supervising body at national level. **All Cabinet Secretaries** are members of NDCC

- **Office of the Civil Defense** - Secretariat

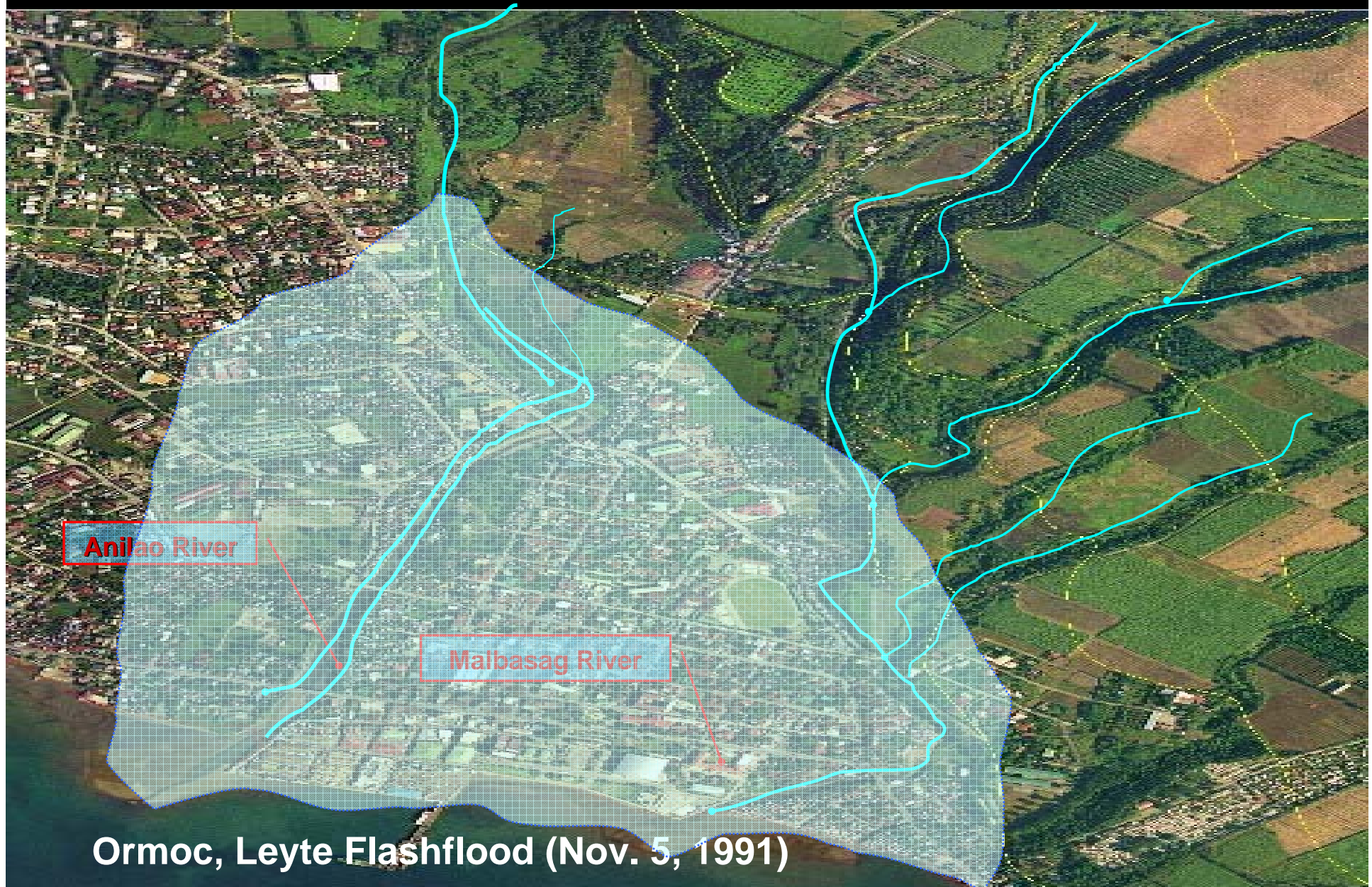
Flow Chart of Data Dissemination Warning and Evacuation







Why still many casualties?





Lack of Structural and Non-Structural
Measures
and Preparedness

Why still many casualties?



Southern Leyte December 2003

Why still many casualties?



**Debris flow/Alluvial Fan
Deposition in Aurora Province
(Dec. 3, 2004)**



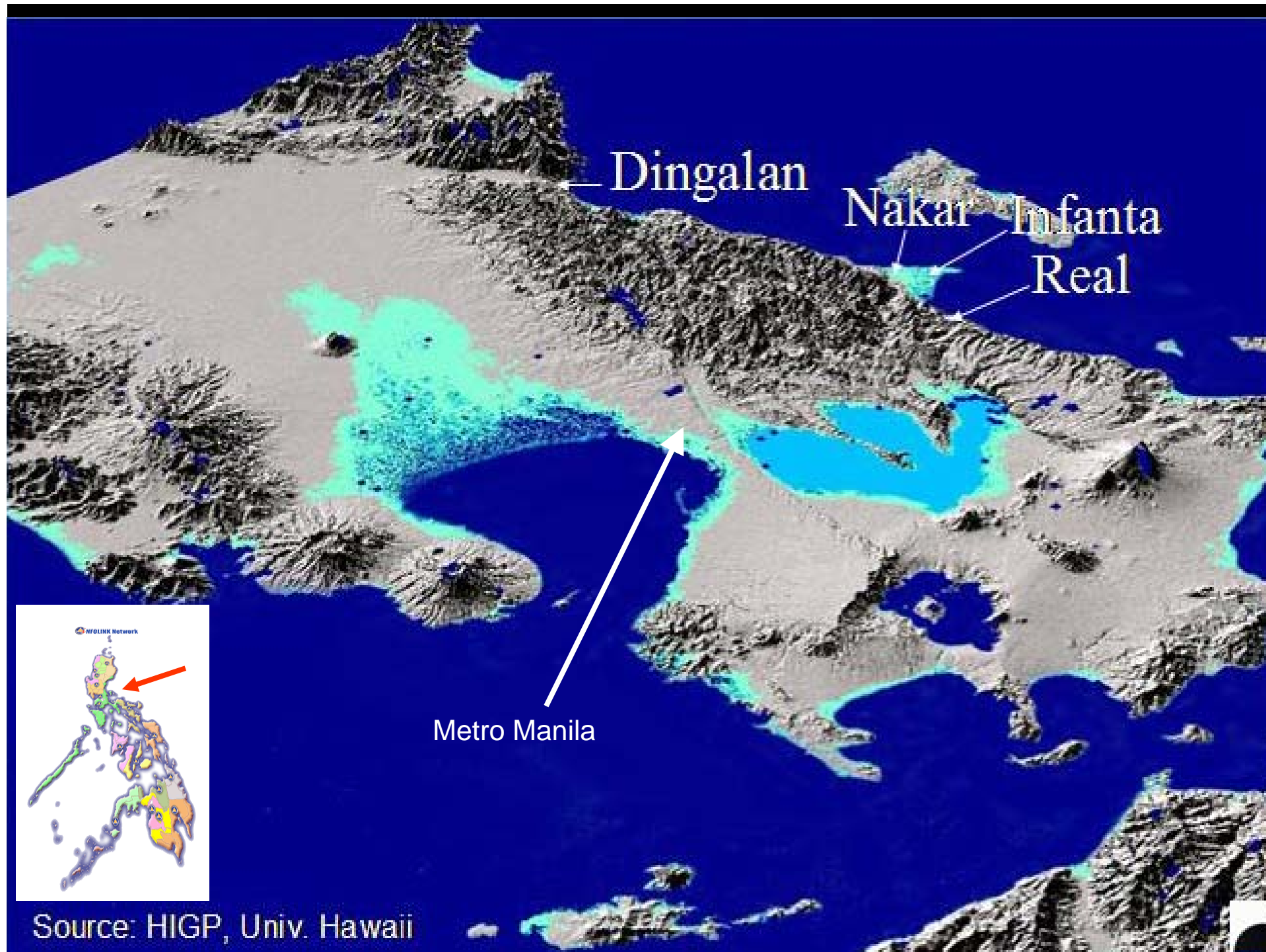
Why still many casualties?



Many people died when they took refuge here



Quezon Province Flash Floods and Debris (Dec. 3, 2004)



Source: HIGP, Univ. Hawaii

Topographical Location

Wrong perception of safe evacuation

No clear evacuation area

Why still many casualties?



Southern Leyte in February 2006

Why still many casualties?



Southern Leyte in February 2006

Lack of technical people with
knowledge and capability in
investigating high risk areas
(mechanism of disasters)

The community/people always blame
the logging operations for the disasters
and the investigation will stop there

Why still many casualties?



Bicol Disaster November 29, 2006

Why still many casualties?



Bicol Disaster November 29, 2006

Structural Measures gave a wrong
impression of safety

Residents did not evacuate because
they felt they are safer in their
concrete houses

Some doesn't want to leave their
properties

Budget for the Warning System

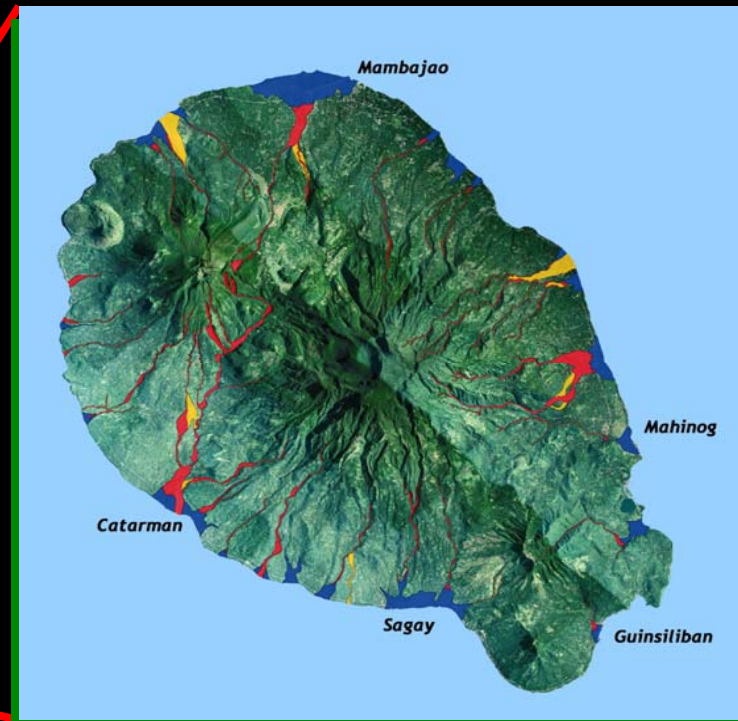
Study on Nationwide Flood Risk Assessment and Flood Mitigation Plan for the Selected Areas of the Philippines

- A technical assistance from the Government of Japan
- Started: September 2006
- Finish: March 2008
- Objectives: - To select prioritized areas based on the flood risk assessment and to prepare flood mitigation plans for the selected areas and to conduct transfer of technology to DPWH during the course of the study

Study on Nationwide Flood Risk Assessment and Flood Mitigation Plan for the Selected Areas of the Philippines

- Present Progress: Data gathering, site survey, investigation and confirmation of the actual site problems
- The Government of the Philippines already started the Multi-hazard Mapping under the fundings of UNDP – the outputs will be utilized in the future for the flood hazard mapping and evacuation route in the high risk areas

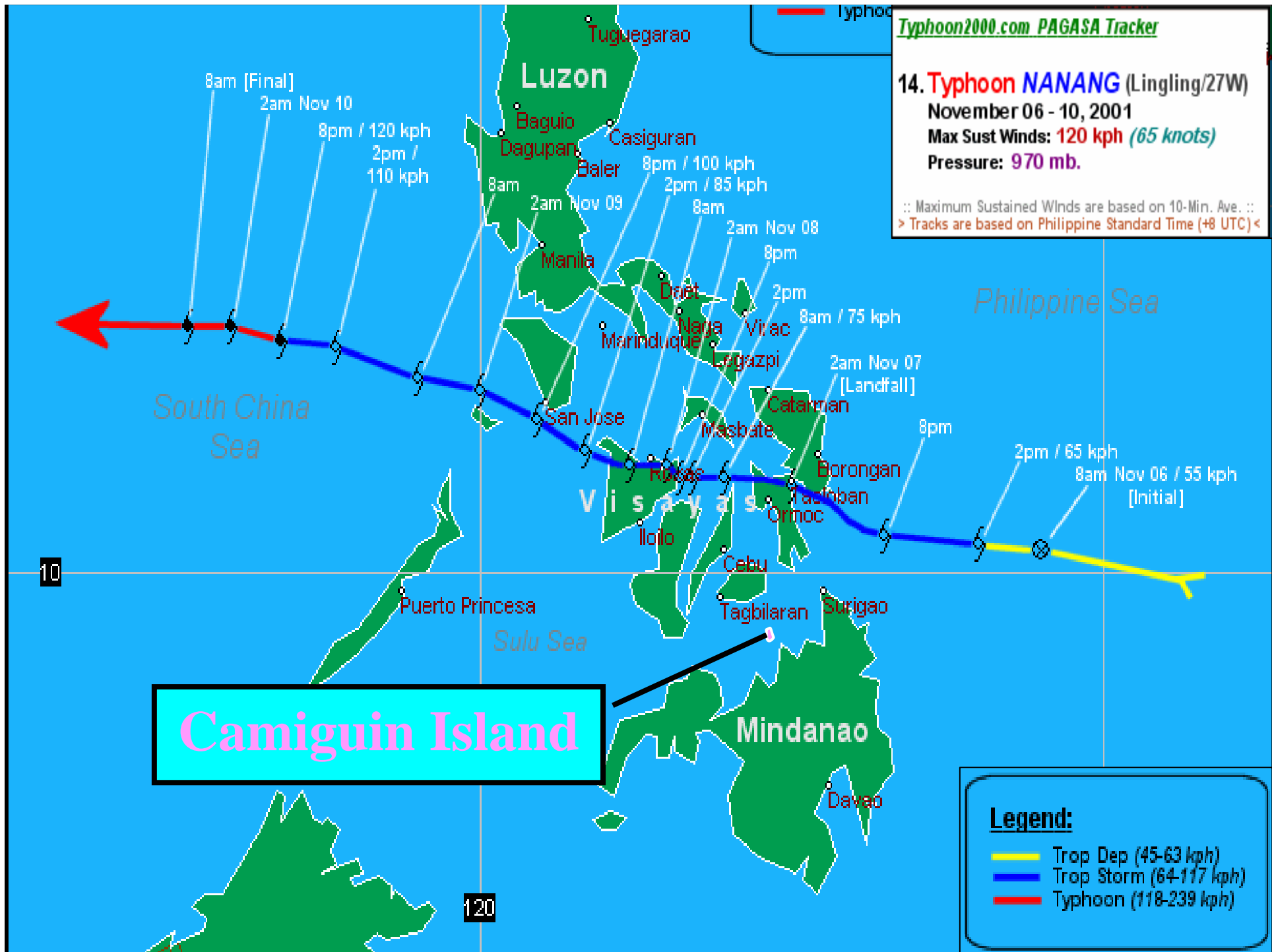
Community based Non-Structural Disaster Prevention Measures for Province of Camiguin, Philippines



Camiguin is an island volcano located at the Southern part of the Philippines

14. Typhoon NANANG (Lingling/27W)
November 06 - 10, 2001
Max Sust Winds: **120 kph (65 knots)**
Pressure: **970 mb.**

∴ Maximum Sustained Winds are based on 10-Min. Ave. ∴
> Tracks are based on Philippine Standard Time (+8 UTC) <



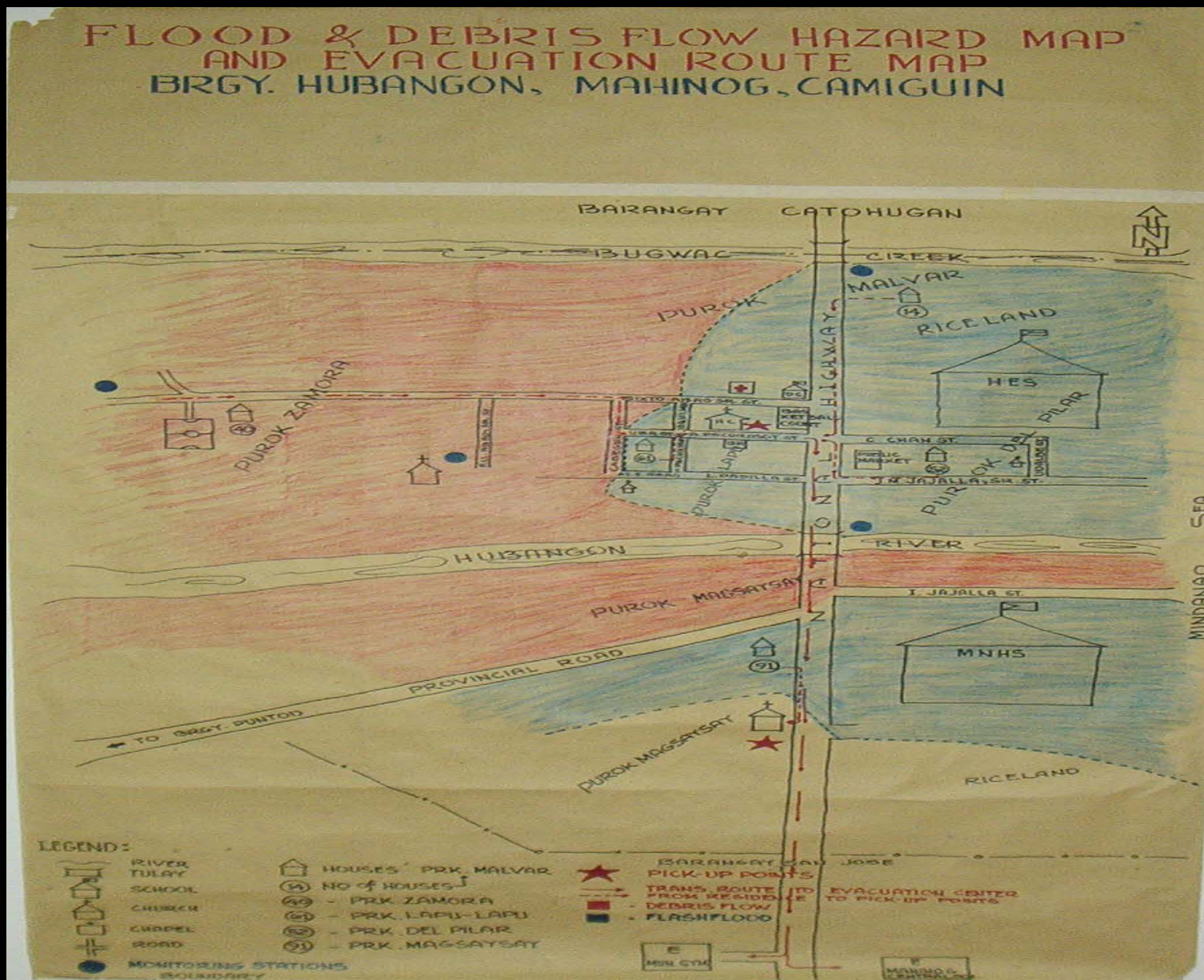
Objectives of Project

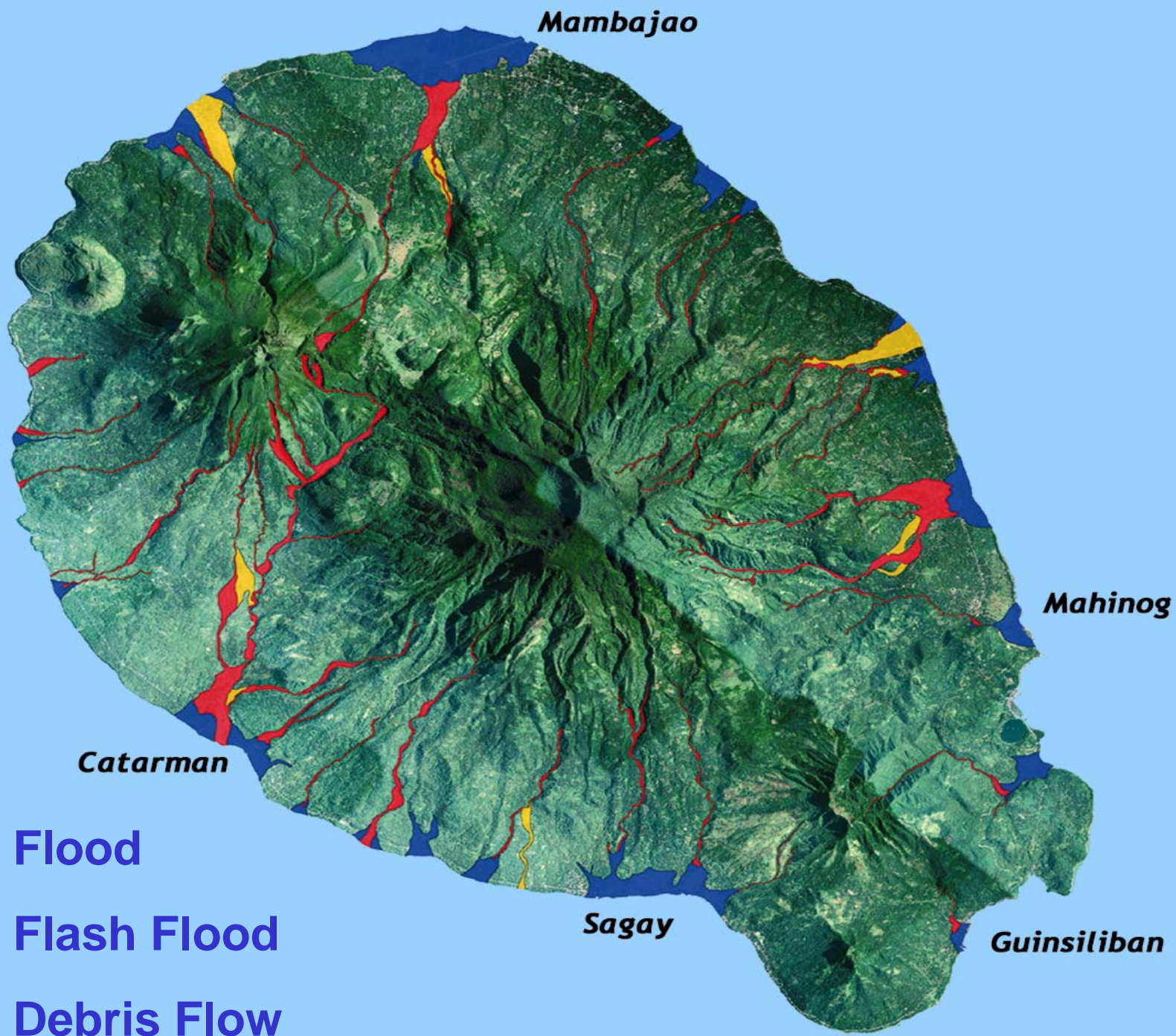
- Strengthen disaster prevention capacities of PDCC/MDCC/BDCC
- Increase the local people's awareness of disaster prevention
- Establish simple and effective disaster prevention method

Activities

- Prepare hazard map
- Develop debris flow warning criteria and warning system
- Increase public awareness on debris flow, flash flood and flood prevention measures

Community Based Hazard Map





Warning System

To establish

Monitoring system

Decision-making system

Communication system

Monitoring

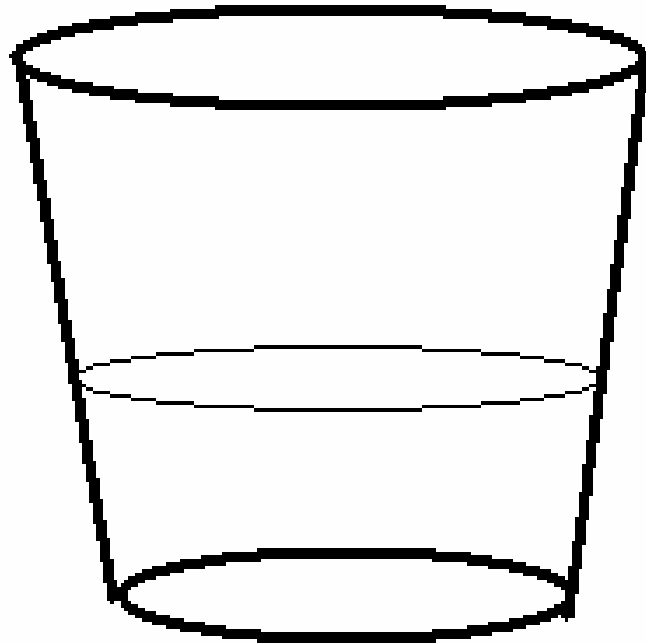


The Standard 8-inch Rain Gauge non-recording type components:

- Measuring Stick 60 cm long
- Overflow Can
- Collector Funnel
- Measuring Tube
- Stand

Rainfall observation

Since the project cannot provide the standard rain gauge for all the high risk Barangays



The line shows equivalent to 35mm rainfall

**Improved
rainfall
measurement**

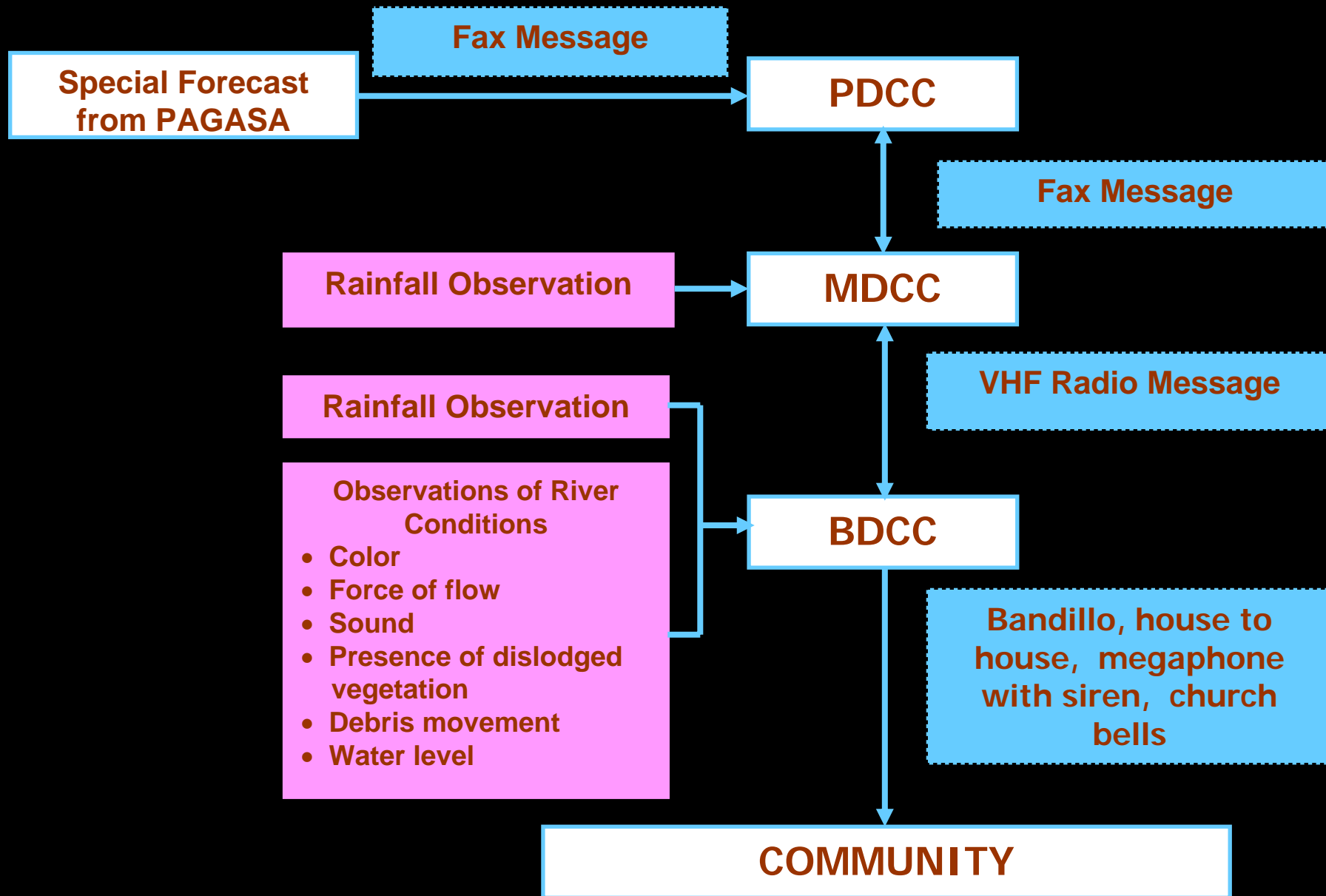
The improvised bucket has been measured and calibrated so that when water reached a point there will be a corresponding value which is the same of that 8 inch standard rain fall gauge

Monitoring



Water level monitoring

Communication System



Decision making

Warning Levels

<i>Stage</i>	<i>Rainfall Intensity</i>	<i>Cumulative Rainfall</i>	<i>Warning Level</i>
Alert			1
Monitoring	Start rainfall measurement		2
Preparatory	20mm/h	60mm	3
Evacuate	30mm/h	100mm	4

Public Awareness Component

- To enhance and strengthen enforcement of public awareness of disaster prevention through community and participatory approaches.

Warning

Church Bell or “Badillo” is being use for alarming the Town folks and nearby Barangays. This will give an alert that people should evacuate. Small and hand held sirens are used by the barangays heads





Training of Trainers





Community Dialogues





Table Top Exercise





Evacuation Drill



Conclusion

- Simple countermeasures are effective for a small community to understand and to sustain
- Through participatory approach the end-users recognized the problems and its benefits
- Regular monitoring of the island's activities and drills should be carried out

Community based non-structural measures can save a lot of lives.

Thank You Very Much
Domo Arigato Gusaimashita
Maraming Salamat Po



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Barangay Sta. Rosa, Pasig City, 1600 Philippines



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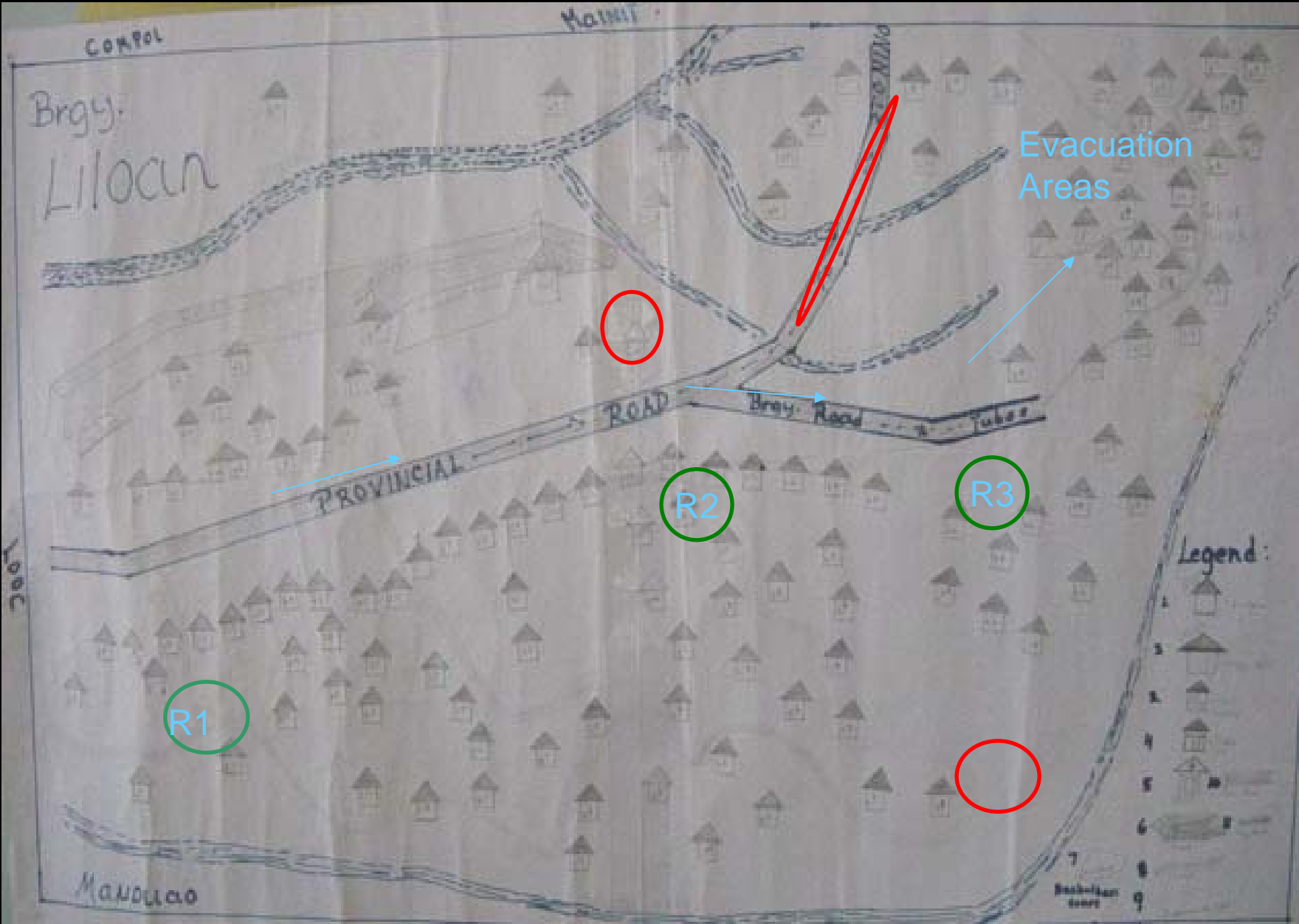
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LILLOAN, CATARMAN

Barangay Spot Map



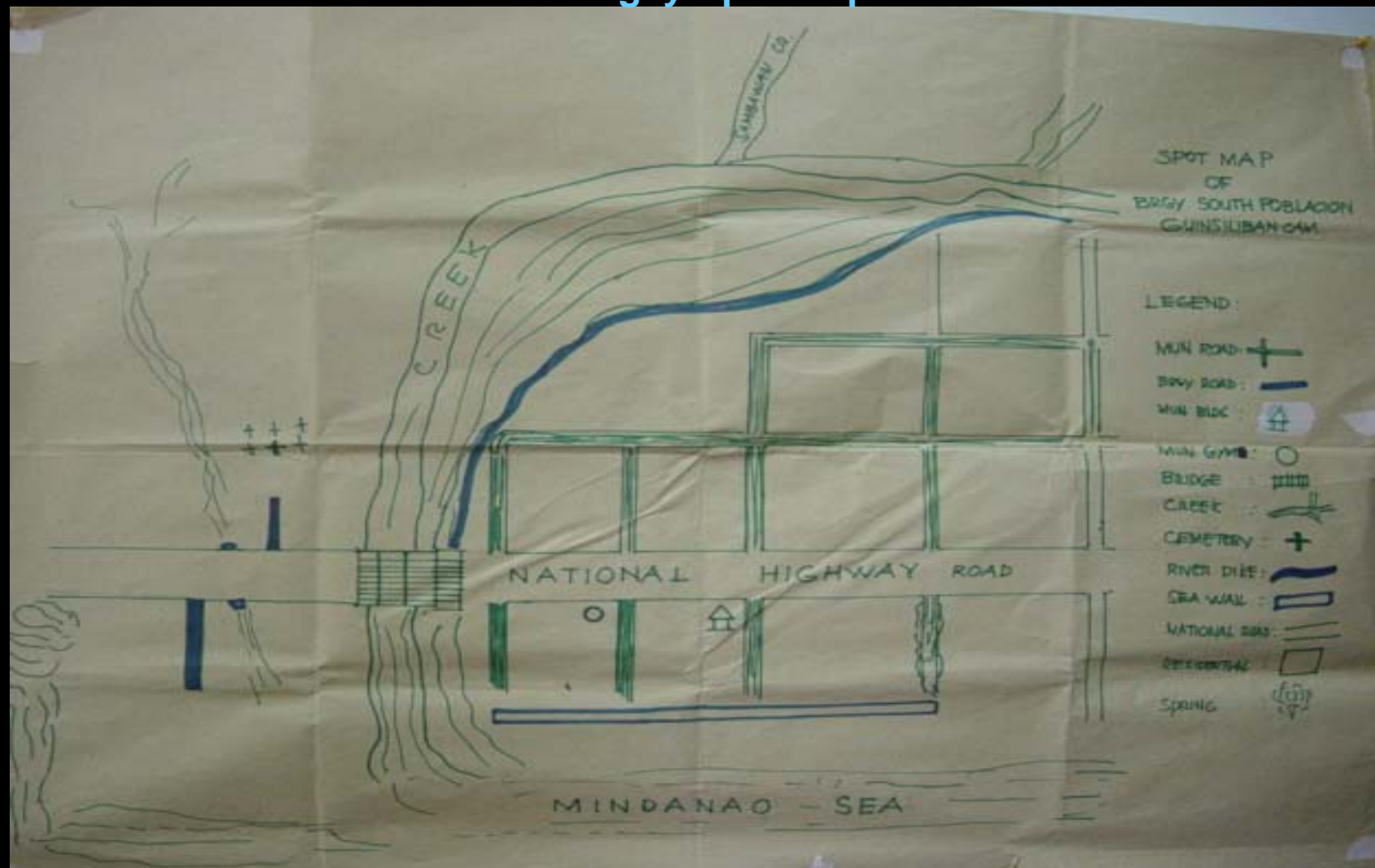
POBLACION, SAGAY

Barangay Spot Map

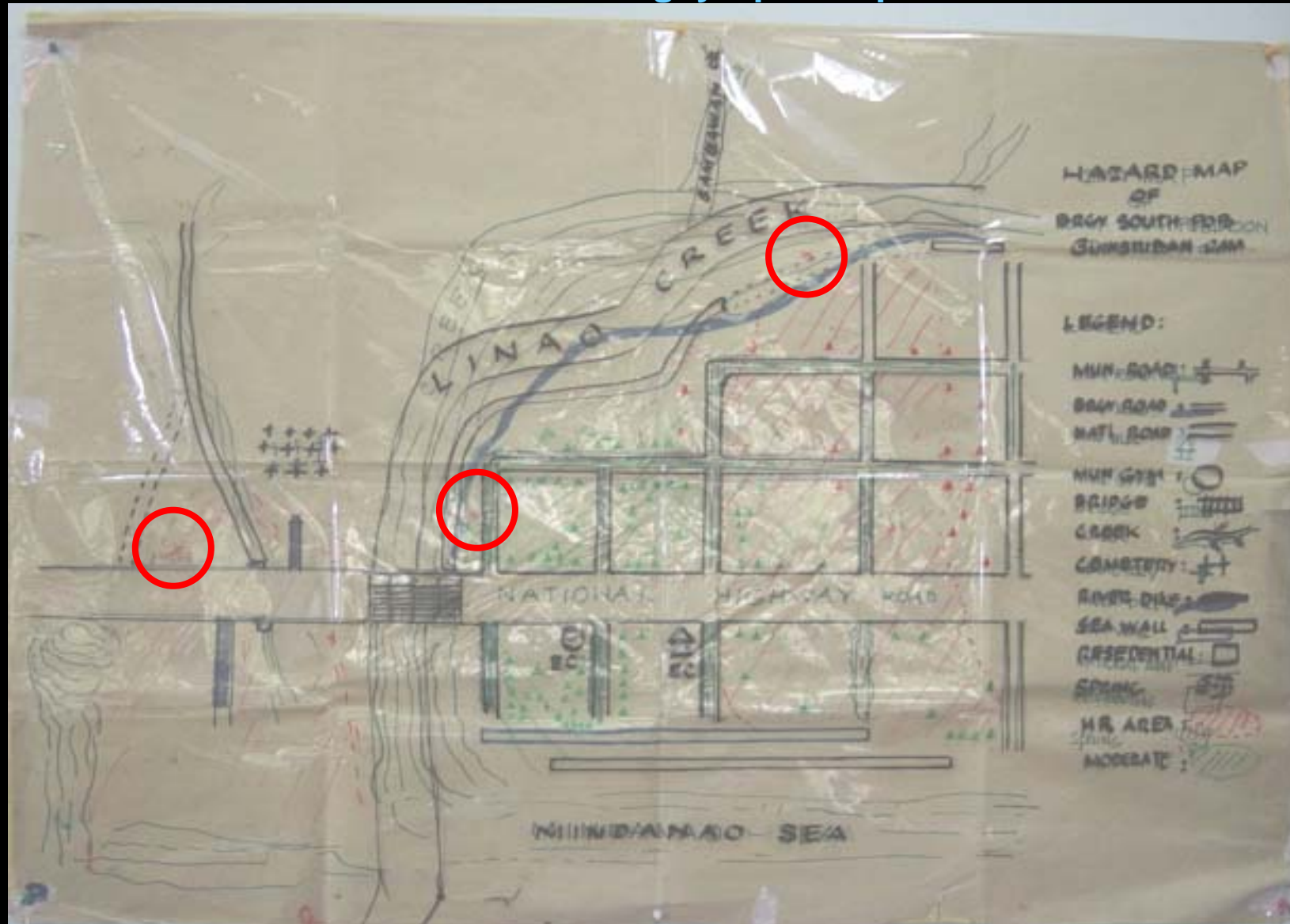


SOUTH POBLACION, GUINSILIBAN

Barangay Spot Map



South Poblacion, Guinsiliban Barangay Spot Map



TUPSAN, Mambajao

Barangay Spot Map



TUPSAN, Mambajao

Barangay Hazard Map



BAYLAO, MAMBAJAO

Barangay Spot Map



