

JMA/WMO WORKSHOP ON EFFECTIVE TROPICAL
CYCLONE WARNING IN SOUTHEAST ASIA
TOKYO, JAPAN
MARCH 11-14, 2014

Response and Lessons Learned from Typhoon “HAIYAN” (YOLANDA)

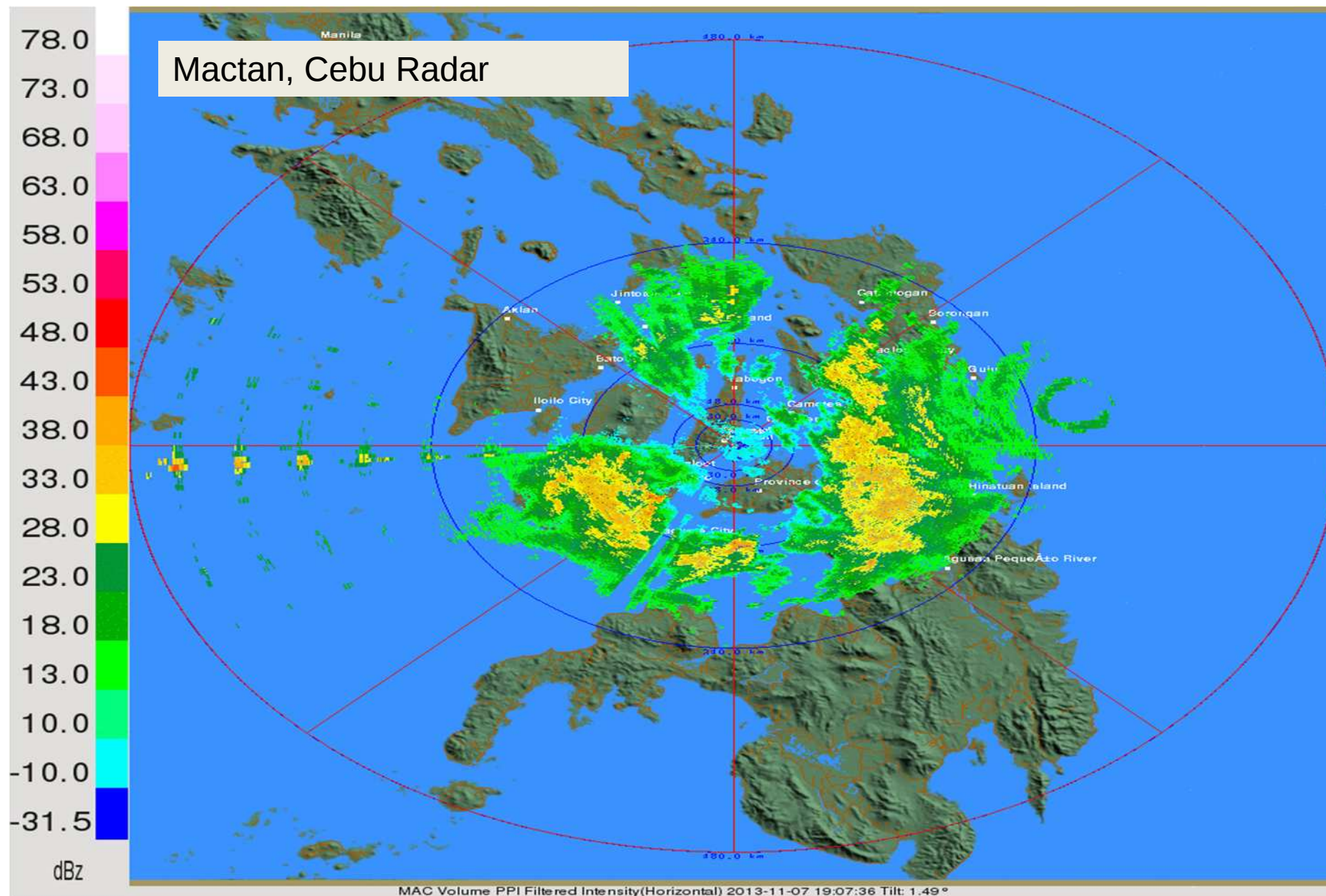
Rene B. Paciente
Weather Division
PAGASA
Philippine



OUTLINE

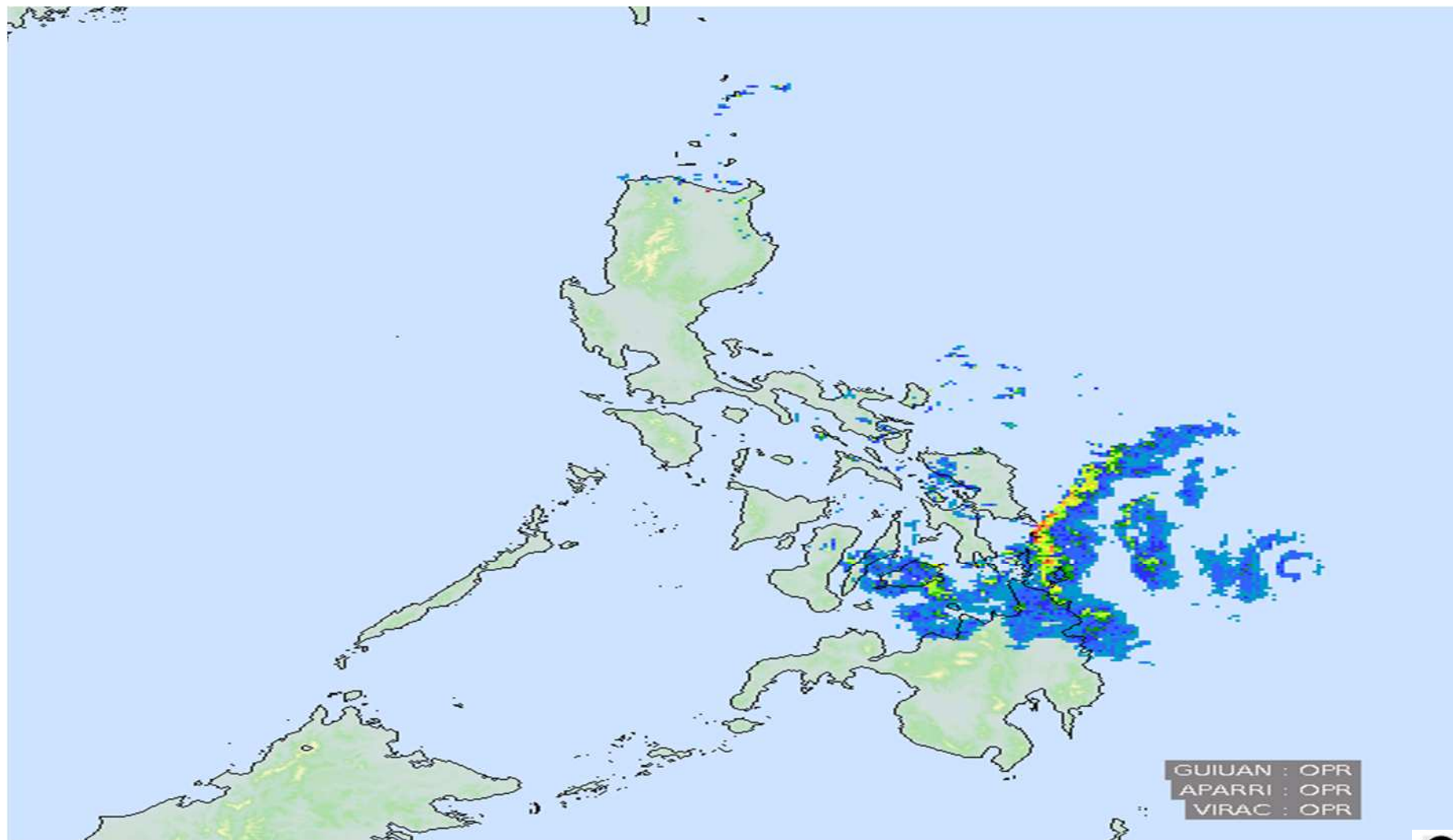
1. Meteorological Informations
2. Impacts
3. Actions Undertaken
4. Problems / Lesson Learned
5. NDRRMC Reflection Workshop
(Results)



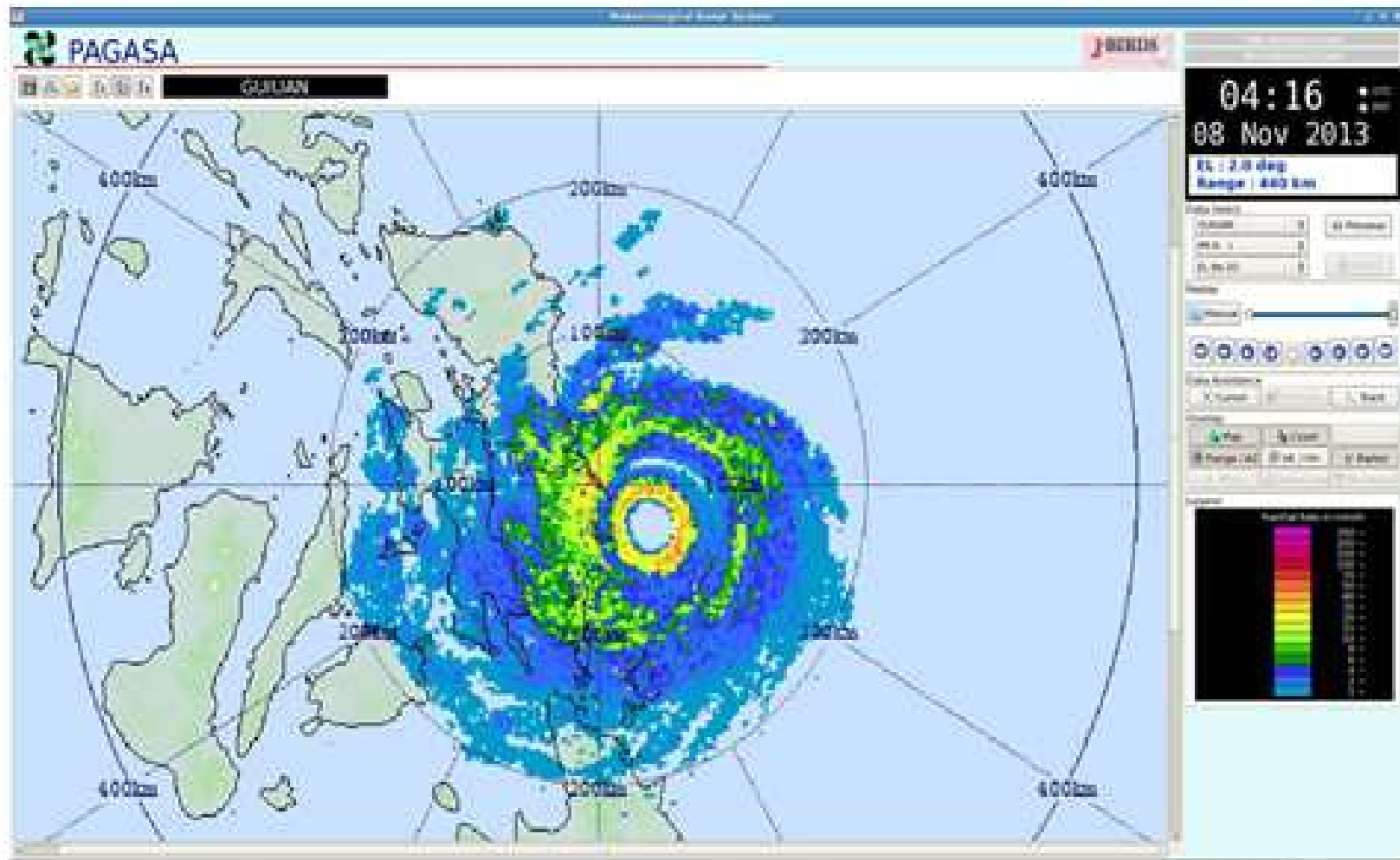


Philippine Atmospheric, Geophysical and Astronomical Services Administration
(PAGASA)

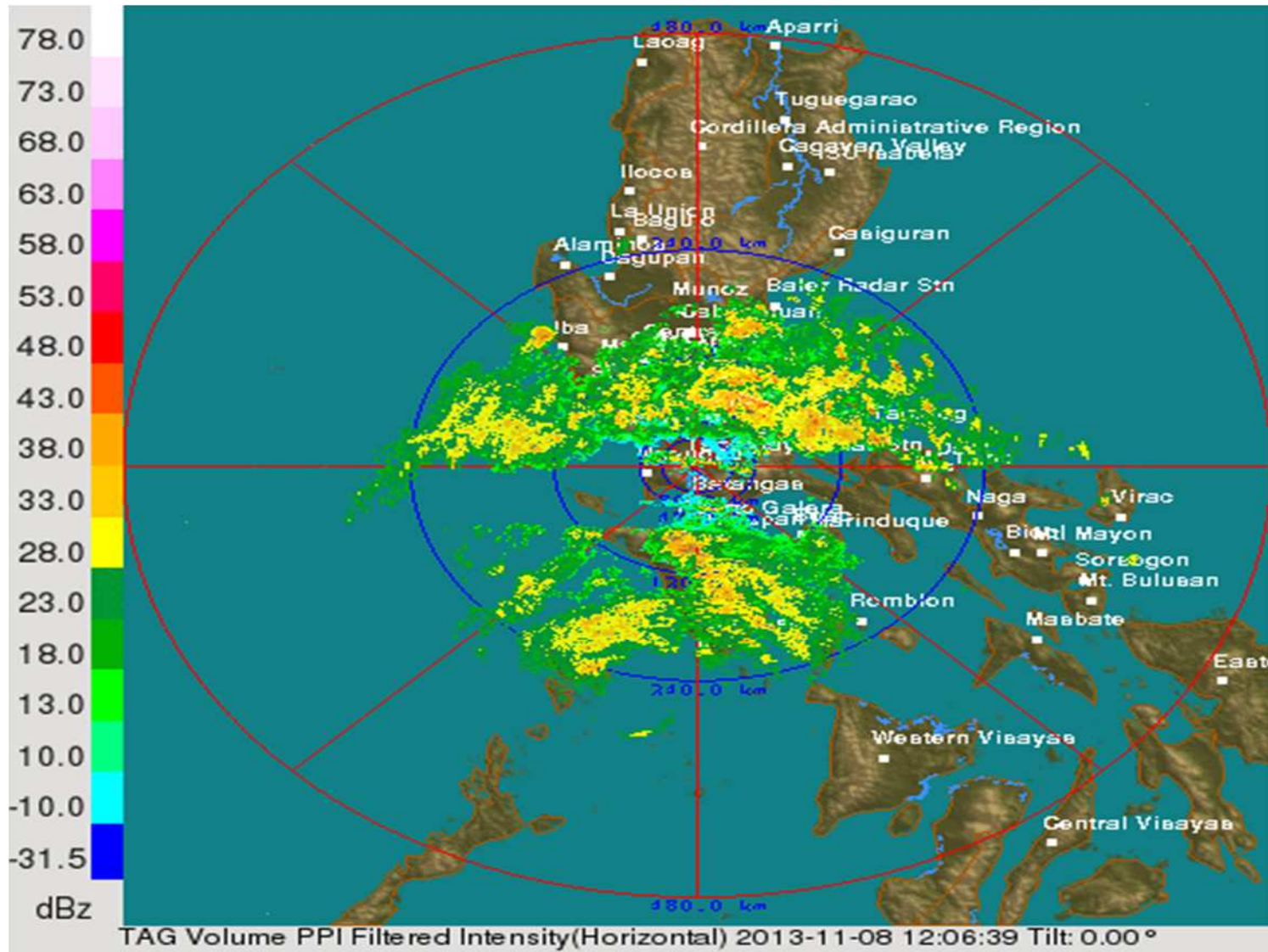
Composite Radar Image



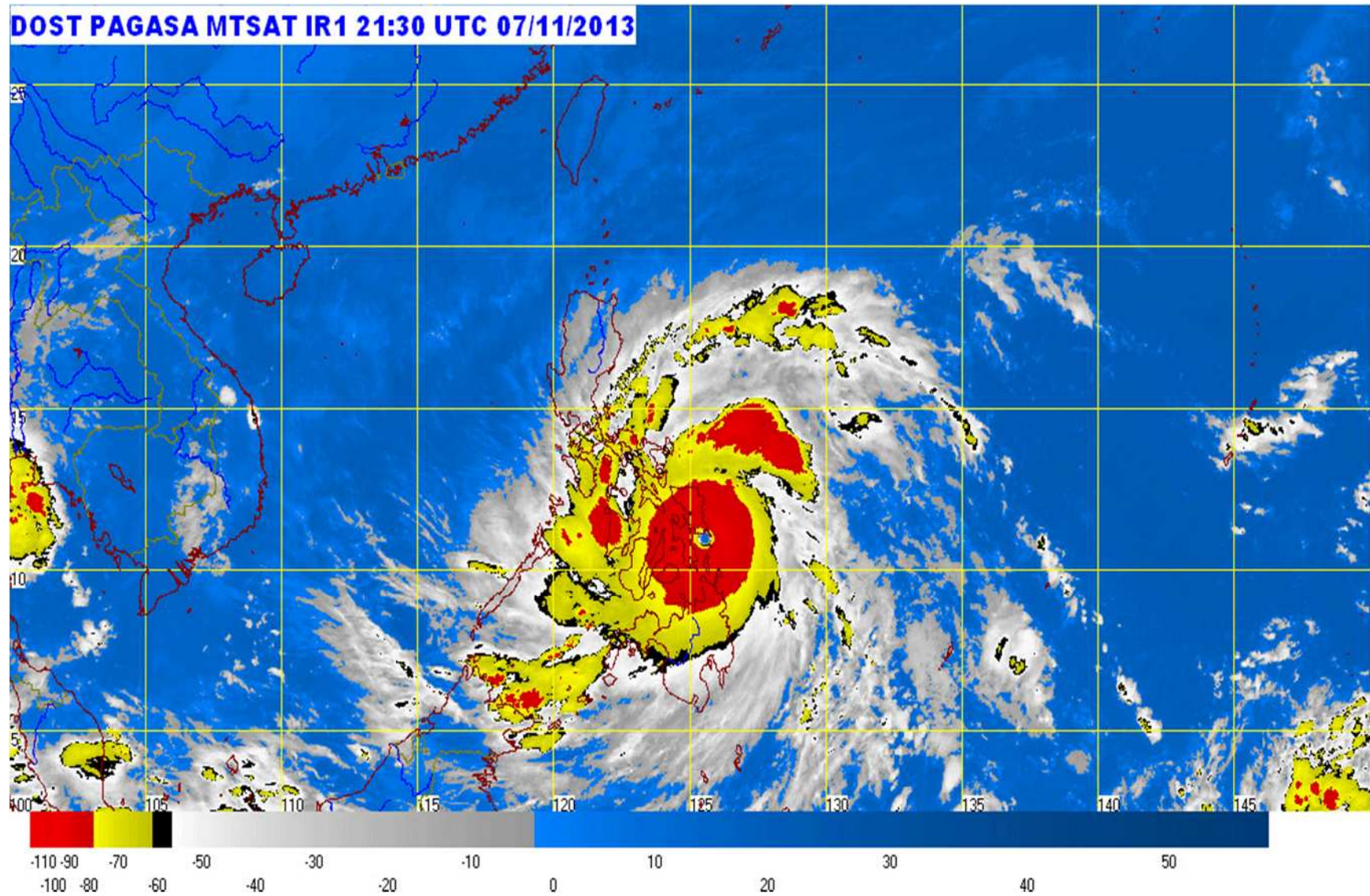
Last image of Guiuan Radar before landfall of TY Haiyan



Tagaytay Radar



MTSAT ANIMATION NOVEMBER 8-9, 2013

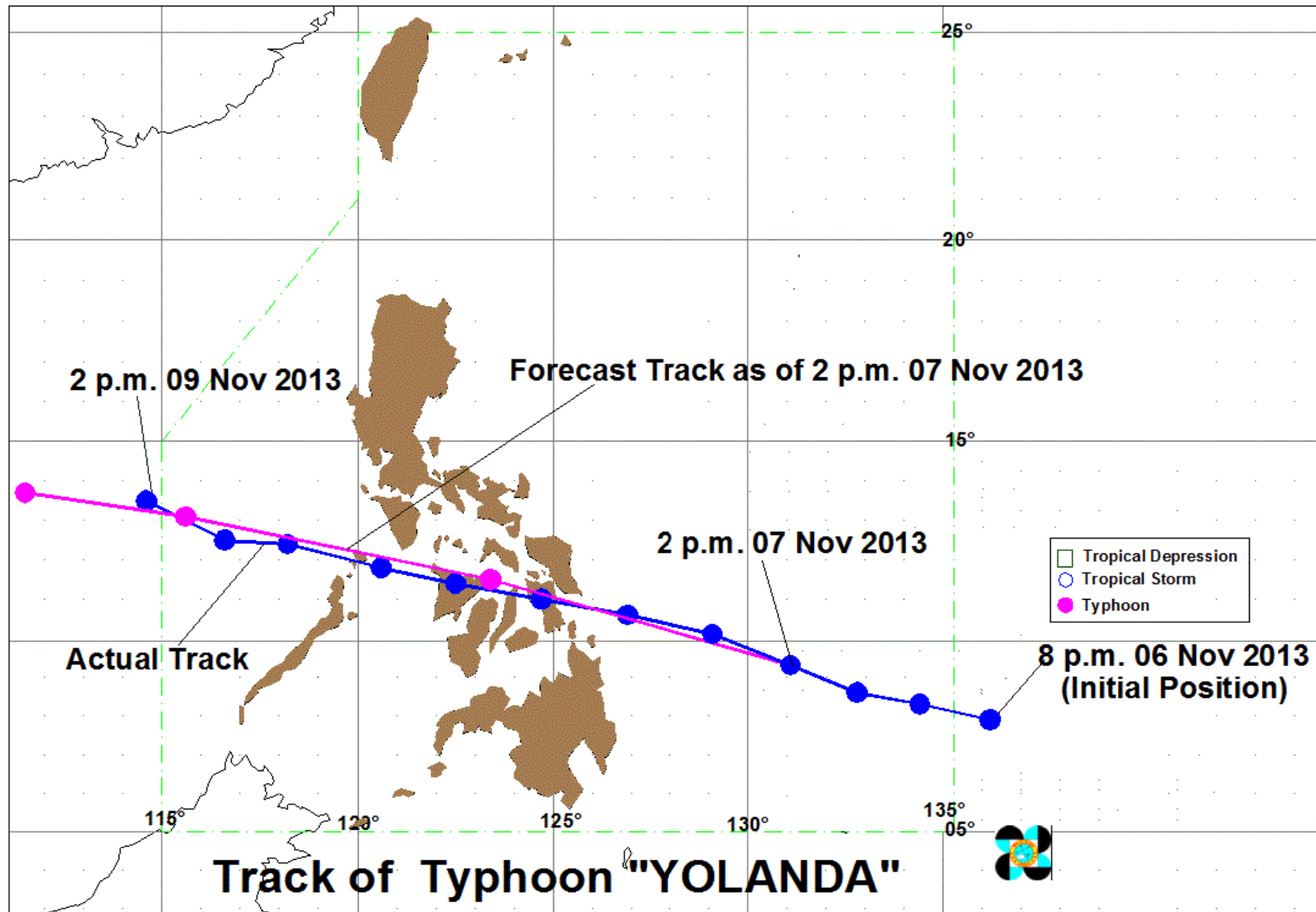


Meteorological Aspects:

- Actual movement of Typ. Haiyan (Yolanda) was predicted accurately. Issued the following warnings:
 - Issued 2 Advisory (every 11 AM Nov. 5-6, 2013)
 - Issued initial Bulletin (Nov. 6/11Pm) even though it was still outside PAR
 - Issued 12 Severe Weather Bulletins
 - disseminated through OCD-NDRRMC
 - conduct press conferences, social network, including SMS, twitter and facebook
- Issued hourly location and intensity of the typhoon through PTV 4, PAGASA's website, twitter and facebook accounts and thru SMS.



Forecast Track vs. Actual Track



● Actual track

● Forecast track



METEOROLOGICAL ASPECTS

Observed Sustained Winds and Gustiness

Sustained Winds:

Guiuan, Samar	86 knots (160 kph)(910.0 hPa)[4:00Am, Nov. 8]
Roxas, Capiz	70 knots (130 kph)(972.5 hPa)[2:00Pm, Nov. 8]
Coron, Palawan	30 knots (55 kph) [6:00Pm, Nov. 8]
San Jose, Mindoro	40 knots (75 kph) (991.1 hPa)[7:35Pm, Nov.8]

Gustiness:

Guiuan	53 m/s (195 kph)[4:10Am, Nov. 8]
Roxas City	58 m/s (205 kph)[1:50Pm, Nov. 8]
Tacloban City	55 m/s (200 kph)[6:00Am, Nov. 8]
Coron	44 m/s (160 kph)(971.0Hpa)[8:00Pm, Nov. 8]
San Jose	33 m/s (120 kph) [7:30Pm, Nov. 8]
Borongan	35 m/s (125 kph) [6:10Am, Nov. 8]
Cebu City	35 m/s (125 kph) [9:40Am, Nov. 8]



IMPACTS OF TYPHOON “HAIYAN” (YOLANDA)



Impacts of TY “HAIYAN”

Affected Population

Families	Person	Baranggays	Municipalities	Provinces
3,434,593	16,078,181	12,139	591	44 Provinces

Casualties

Dead	Injured	Missing
6,245 identified	28,626	1,039

Damage (PhP)

TOTAL
PhP 39,821,497,852.17 (\$ 894,865,120.27)

Source: NDRRMC,
as of 06 March 2014
SitRep #106

Impacts: Damaged PAGASA Doppler radar in Guiuan, Eastern Samar



photo - credit: AFP Central Command from their Facebook page:



Impacts of Typhoon Haiyan



Impacts of Typhoon Haiyan

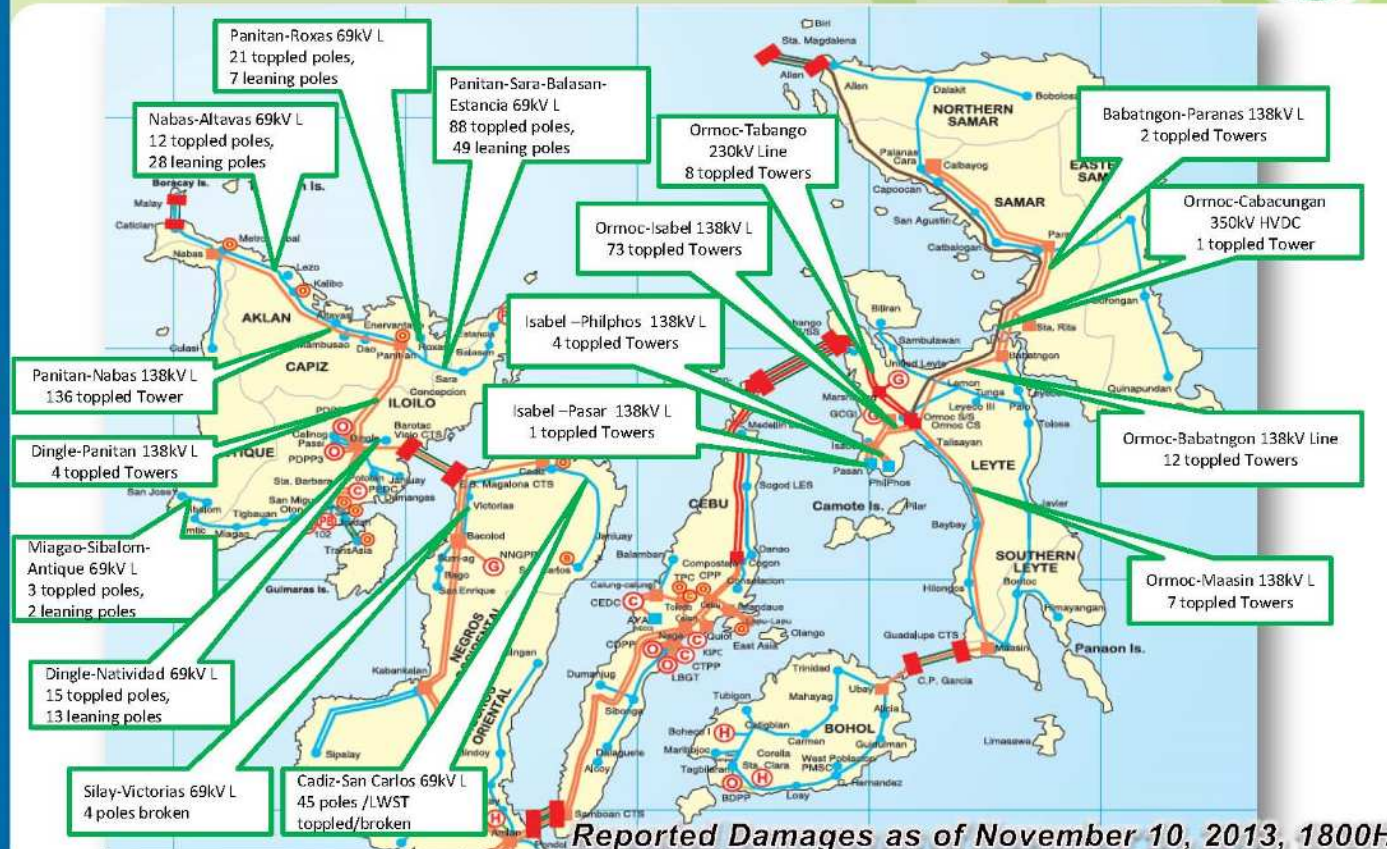


Tacloban Station



Impacts: Toppled Towers of National Grid Corporation of the PHILIPPINES

Report on Damages due to Typhoon Yolanda



Toppled:

- 200 transmission towers
- 2000 poles

Estimated cost of damage:

- PhP5 billion (USD119 M)

Source: NGCP



Impacts of Typhoon Haiyan



Impacts of Typhoon Haiyan



Tacloban Airport



Impacts of Typhoon Haiyan



Malapascua Island, Northern Cebu



Impacts of Typhoon Haiyan



Tacloban City



Impacts of Typhoon Haiyan



THE AFTERMATH

Damages incurred by
Typhoon Yolanda



Several coastal barangays were
wiped out...

THE AFTERMATH

Damages incurred by
Typhoon Yolanda



Wind, surge and wave damages
are enormous ...

THE AFTERMATH

Damages incurred by
Typhoon Yolanda

BEFORE Typhoon Yolanda

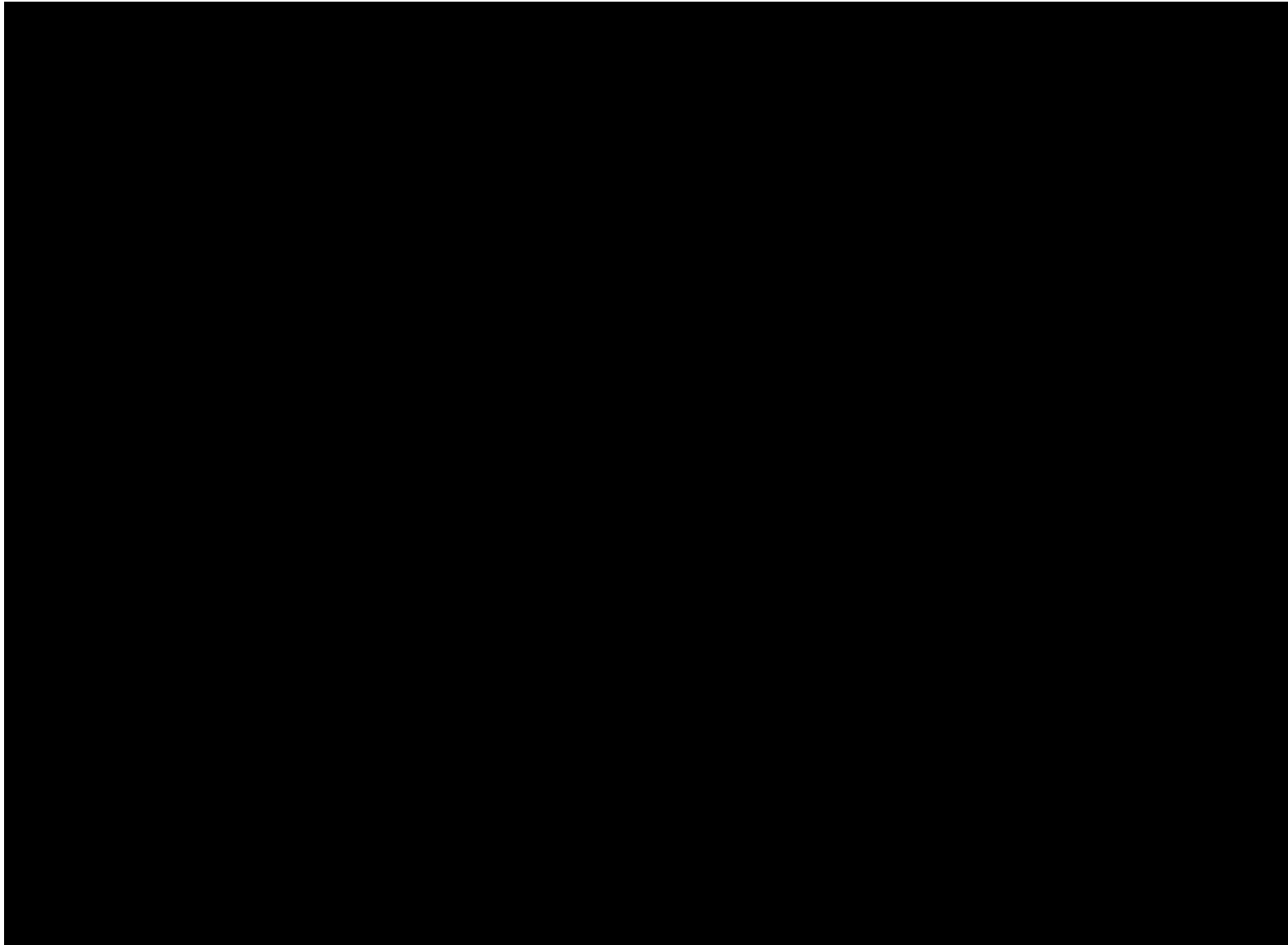


AFTER Typhoon Yolanda

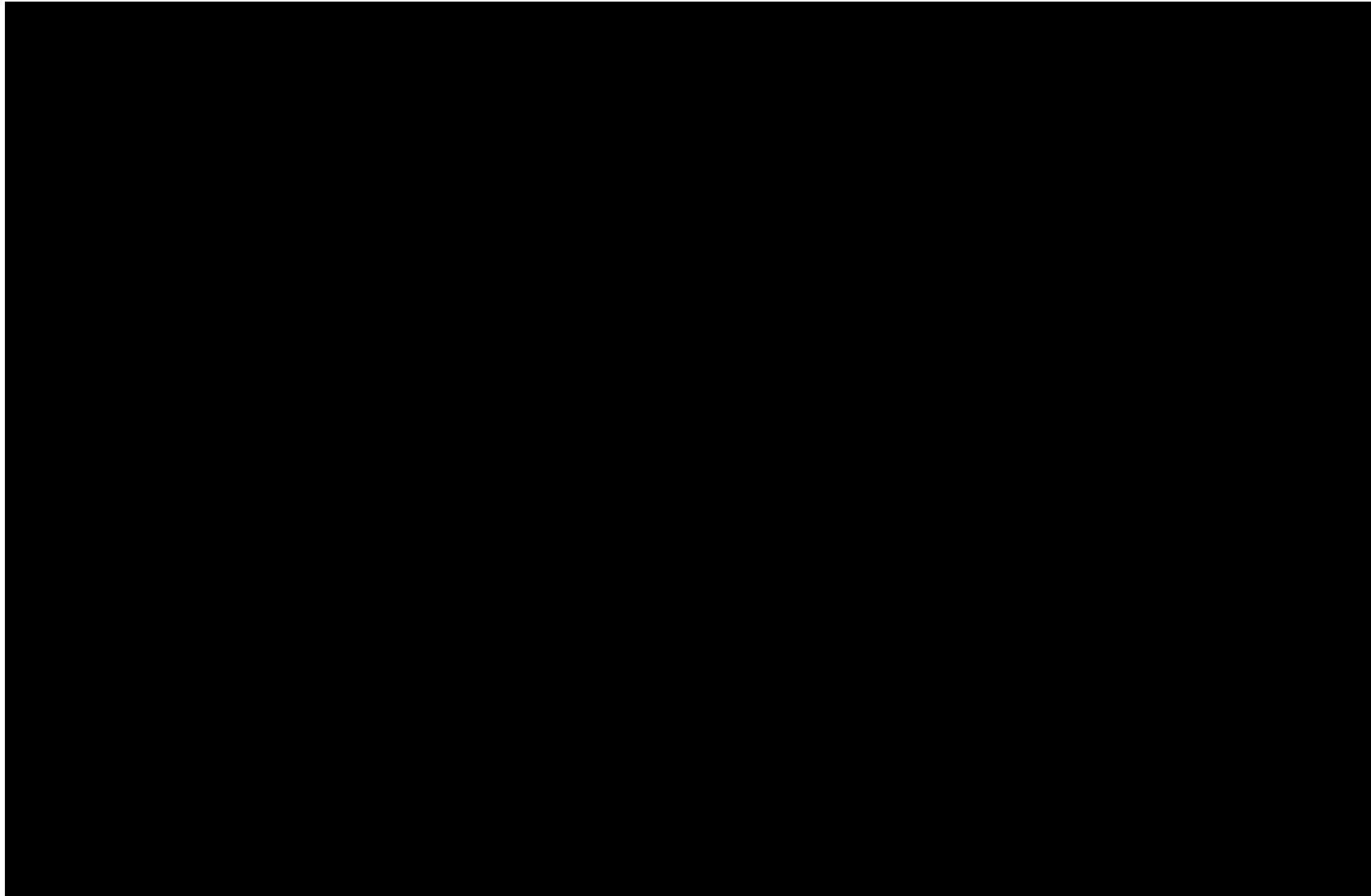


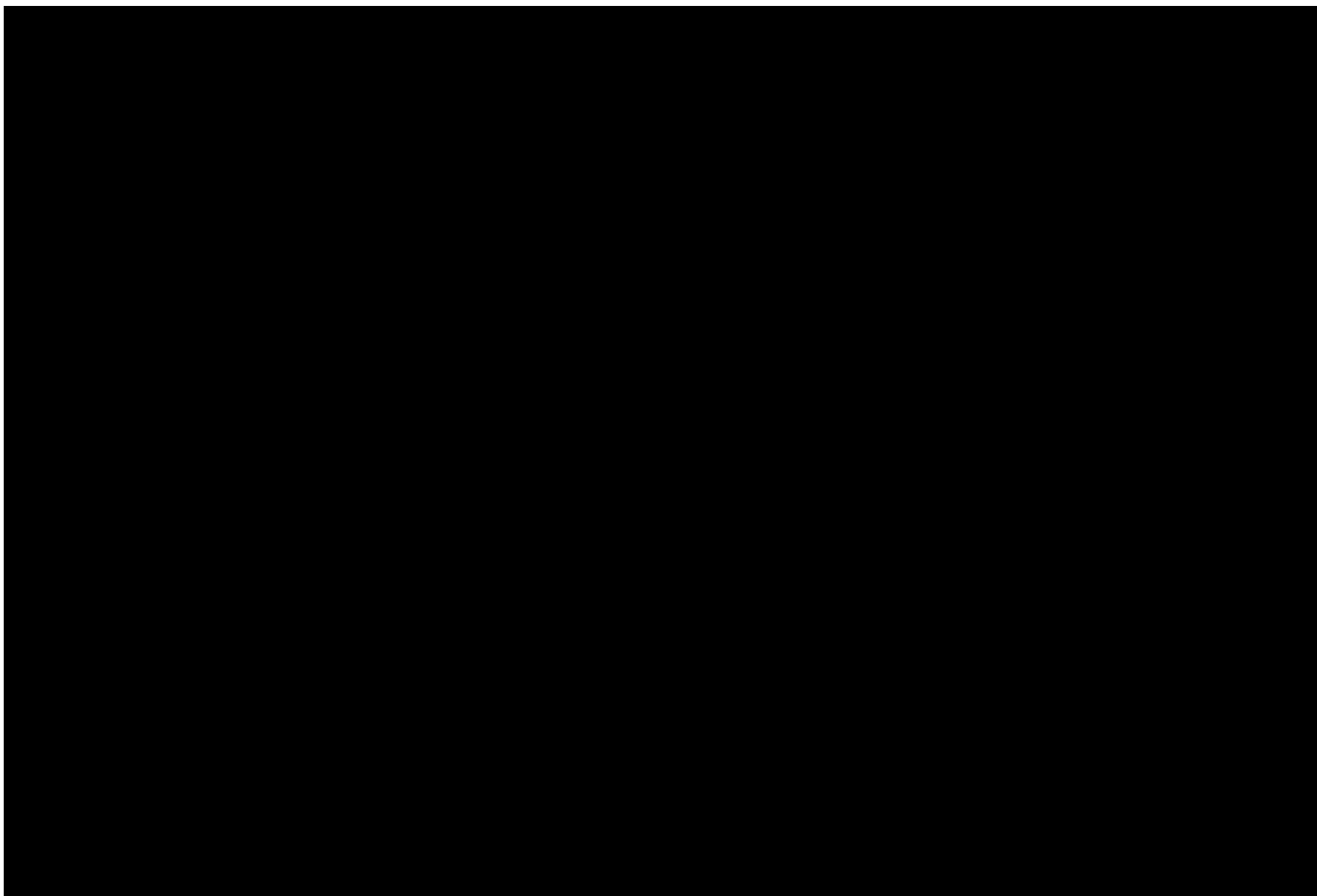
Economic activities were disrupted ,
and livelihoods were destroyed...

Impacts of Typhoon Haiyan



Impacts of Typhoon Haiyan





**Actions Undertaken By PAGASA
During the Approach and Passage of
Typhoon “HAIYAN” (YOLANDA)**



- Nov. 5 (11Am): Issued Weather Advisory regarding the approaching Typhoon Haiyan
- Nov. 6 (11Pm): Issued Regular Typhoon Bulletin even though it was still outside Philippine Area of Responsibility (PAR)
- **Nov. 6:** The Department of Science and Technology (DOST) as Vice-Chair of the National Disaster Risk Reduction and Management Council (NDRRMC), initiated NDRRMC members to convene and conducted press conference after the meeting, for the preparations and early evacuation in areas to be affected by TY Haiyan.



- Nov. 6 - 9: PAGASA Conducted Press Conferences and Press Briefing every 6 hours starting 5:00PM, Nov. 6
- Frequent briefing at Malacañang Palace
- The President broadcasted in tri-media about the strong Typhoon Haiyan (Yolanda) 12 hours before landfall.



- Hourly updates on the location and intensity of the typhoon (Ptv 4, posted in the website, twitter, facebook and SMS).
- Detailed Meteorologists at the OCD(NDRRMC) Operation Center.
- Deployed a team of Storm Chasers to Sorsogon who proceeded to Samar and Leyte after the typhoon passage.



- Sent meteorologists from Central Office to Visayas PAGASA Regional Center and to Iloilo, Nov. 6-11, 2013 to assist the station in the dissemination of warnings and conduct assessment after the typhoon passage.
- Issued daily weather updates for the relief , rescue and rehabilitation of the affected areas.
- Nov. 11: Another Response Team composed of engineers, meteorologists and technicians were sent to Samar and Leyte. They also brought food and other emergency supplies for PAGASA personnel.

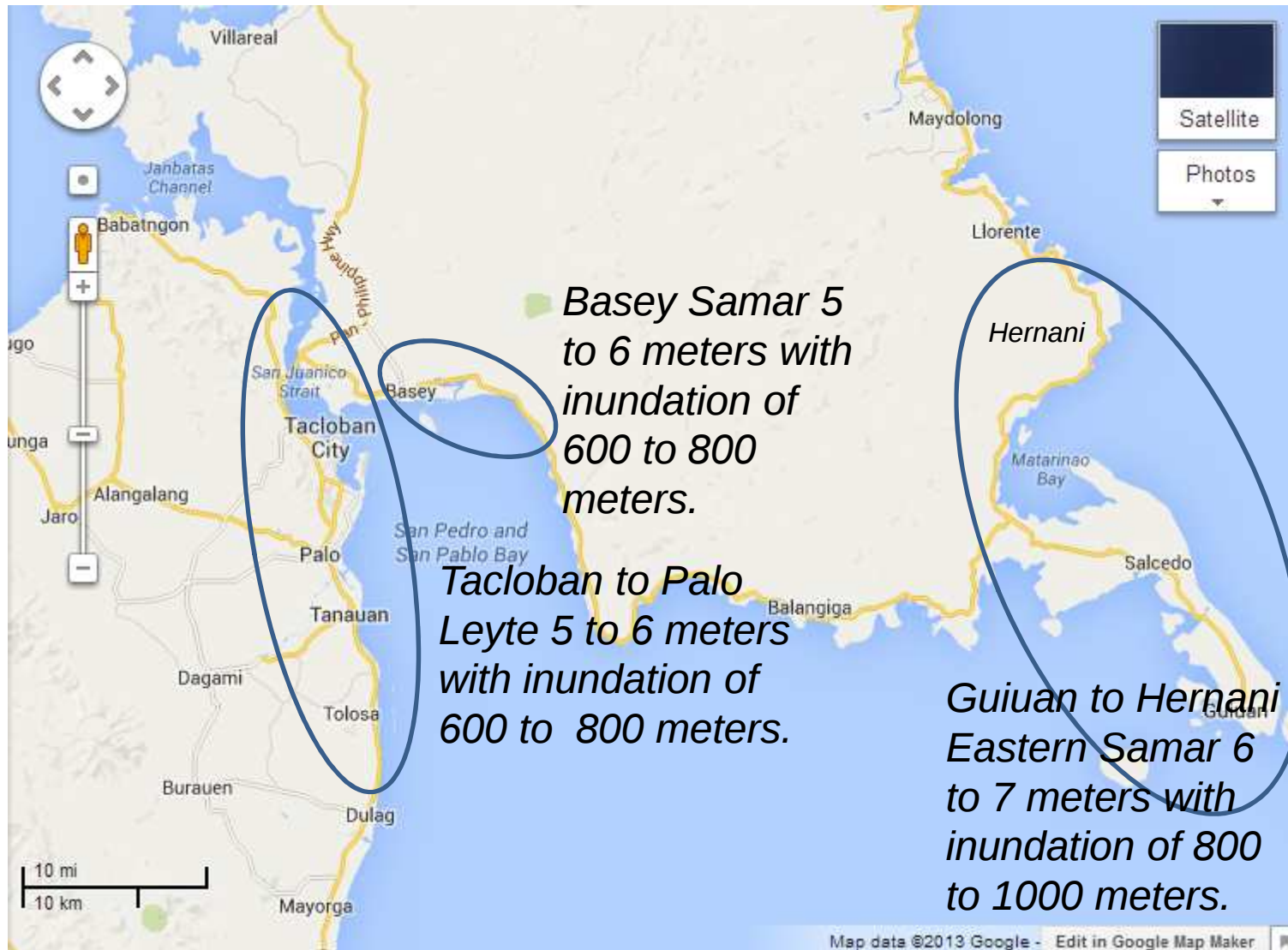


Activities of the Response Teams

- Temporary transfer of Tacloban station to DOST Region 8 Office in Palo, Leyte and installed basic weather instruments.
- Three (3) solar panels were put up for temporary lighting system and radio communication (SSB) at DOST R8 in Palo, Leyte, in Catbalogan and in Guiuan stations.
- Repaired water line at Guiuan station
- Repaired the generator sets of Tacloban, Catbalogan and Catarman stations.
- Re-installed all basic instruments in all affected PAGASA stations.

Survey storm surge heights

(STORM CHASER Team)



- Checked/validated the reported height of the storm surge

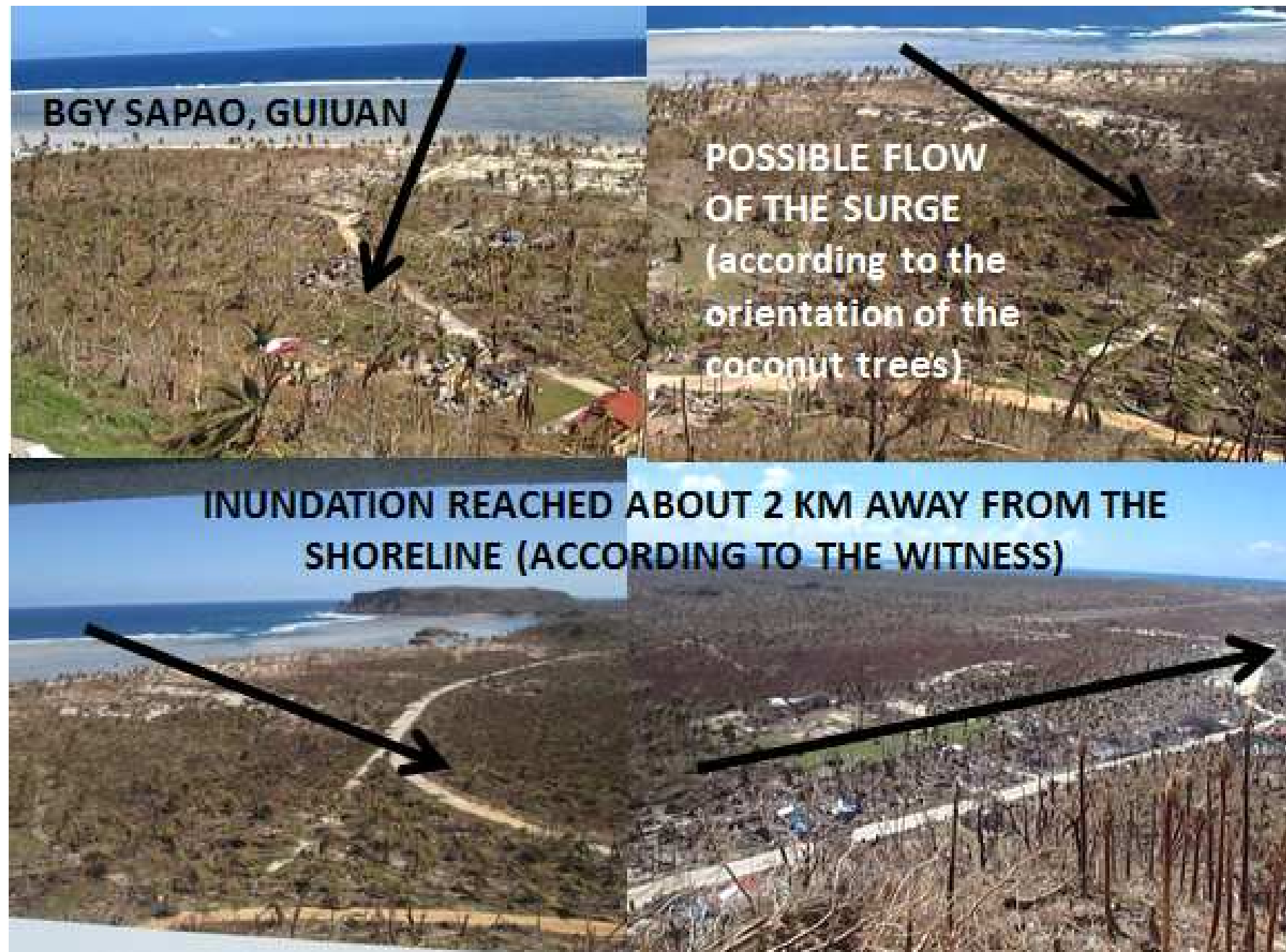




**INTERVIEWED ONE RESIDENT HERE
FAR FROM THE SHORELINE**

**ACTUAL SURGE
HEIGHT = 5.0 M**

**Needs confirmation
from other residents
nearby the coast**







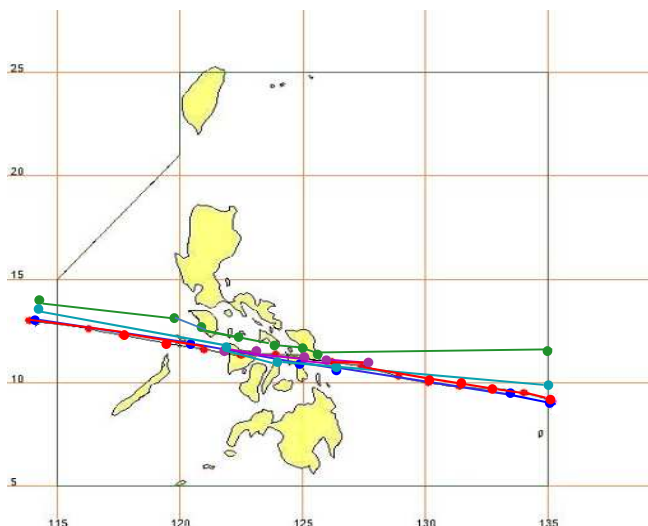
IEC for Teachers and LGUs in Tacloban, Leyte



History of Typhoon Passages Near Tacloban, Leyte

From records dating **1897 to 2013**, many typhoons hit Visayas area, however **5 strong typhoons** landed near Tacloban with notable damages/fatalities:

Date of Typhoon Occurrence	Fatalities	Station Pressure	STORM SURGE
12 October 1897	1,300	925.2 hPa	7.3 m (Hernani)
24 November 1912	52	924 hPa	7 m (Sta. Rita)
27 October 1952	444	930 hPa	No record
04 November 1984	1,167	925 hPa	3.5 m (coastal areas of Leyte)
08 November 2013	6,241 +	910 hPa	6-7 m (Leyte & Samar areas)



Dangerous
Typhoons'
Tracks

1897
1912
1952
1984
2013

Earlier events are recorded in the following documents:

- Philippine Weather Bureau Monthly Bulletins, 1901
- Hongkong Observatory, 1958, re-edited
- Shanghai Observatory, 1957, re-edited
- JMA Library, Japan

Typhoon Yolanda is just a repeat of what happened in the past except that the damage was severe and highest because more people and infrastructure moved into harm's way.

Problems(Lessons Learned) During the Rescue and Relief Operations

- No communication of any sort available
- No power supply
- Heavy equipments and other vehicles were temporarily inoperational
- Impassable roads
- Relief goods stored in the provinces and regions were damaged and washaway



Problems(Lessons Learned) During the Rescue and Relief Operations

- Members of the Local Responders were also victims and cannot do their jobs
- Disaster Managers / LGUs were also victims
- Airport in the area were temporary inoperational



Lessons Learned (Problems)

- People were not aware of the destructive power of Storm Surge
- Proper implementation of contingency plan for every hazard
- Availability of Hazard Maps (implementation)
- People do not heed to the advice of the Disaster Managers / LGUs



Lessons Learned(Problems)

- Review building code and zoning (safe zones)
- Disaster drill should be done every year
- Construction of storm surge breaker/barrier or planting mangrove trees
- Evacuation centers(multi-purpose) should be disaster resilient with basic amenities



NATIONAL DISASTER RISK REDUCTION COUNCIL (NDRRMC)

REFLECTION WORKSHOP

ON

Typhoon “Haiyan” (Yolanda)

Participants: NDRRMC Member-Agencies
Namely: DOST, DSWD, NEDA, DPWH, DILG,
DOH, DENR, PIA, NHA, DOTC, DOF and DND



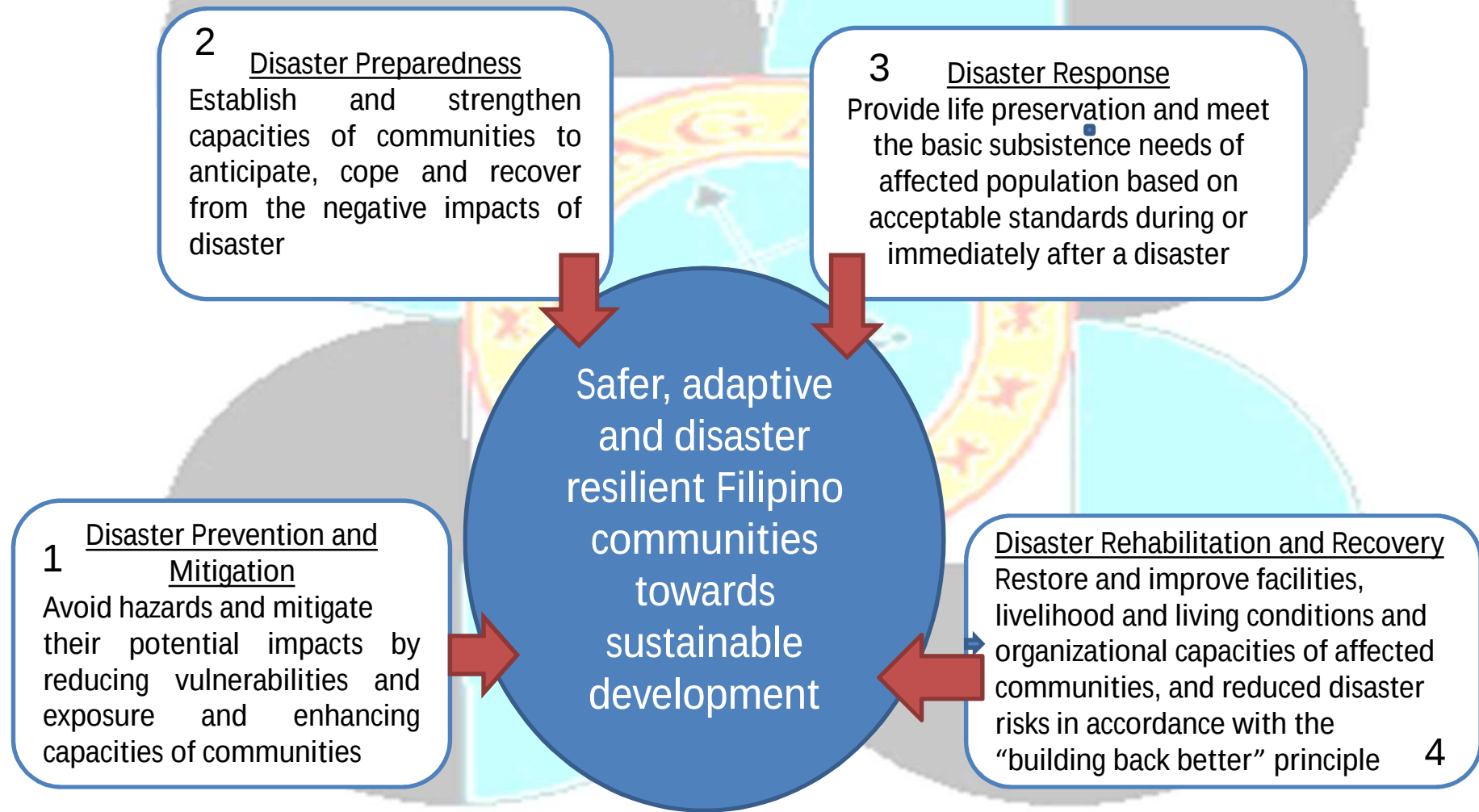
Objectives:

- a. Gather in one place, the members of the NDRRMC-TMG and the Members of the NDRRMC
- b. Conduct parallel cluster-level assessments to identify (reflect the following)
 - ☐ Good practices and lessons learned before, during and after Typhoon Haiyan
 - ☐ Gaps and recommendations
- c. Present the outputs to the members of the NDRRMC-Member Agencies for adoption

Output: Key learning points and list of information to be gathered and presented.



National Disaster Risk Reduction and Management Plan



Thematic Area 1: Disaster Prevention and Mitigation

Overall Responsible Agency: Department of Science and Technology (DOST)

Outcome

Lead Agency

- | | |
|--|--|
| 1. DRRM and CCA mainstreamed and integrated in national, sectoral, regional and local development policies, plans and budget | Office of Civil Defense (OCD), NDRRMC |
| 2. DRRM and CCA-sensitive environmental management | Department of Environment and Natural Resources (DENR) |
| 3. Increased resiliency of infrastructure systems | Department of Public Works and Highways (DPWH) |
| 4. Enhanced effective community-based scientific DRRM and CCA assessment, mapping, analysis and monitoring | OCD, NDRRMC |



- 5. Communities access to effective and applicable disaster risk financing and insurance
- 6. End-to-end monitoring (monitoring and response), forecasting and early warning systems are established and/or improved

Department of Finance (DOF)

Department of Science and Technology (DOST)

Thematic Area 2: Disaster Preparedness

Overall Responsible Agency: Department of Interior and Local Government (DILG)

OUTCOME

LEAD AGENCY

- 7. Increased level of awareness and enhanced capacity of the community to the threats and impacts of all hazards
- 8. Communities are equipped with necessary skills and capability to cope with the impacts of disasters

Philippine Information Agency (PIA)

Department of Interior and Local Government (to coordinate) and NDRRMC (to implement)



9. Increased DRRM and CCA capacity of Local DRRM Councils, Offices and Operation Centers at all levels

10. Developed and implement comprehensive national and local preparedness and response policies, plans, and systems

11. Strengthened partnership and coordination among all key players and stakeholders

Thematic Area 3: Disaster Response
Overall Responsible Agency: Department of Social Welfare and Development (DSWD)

OUTCOME

12. Well-established disaster response operations

DILG

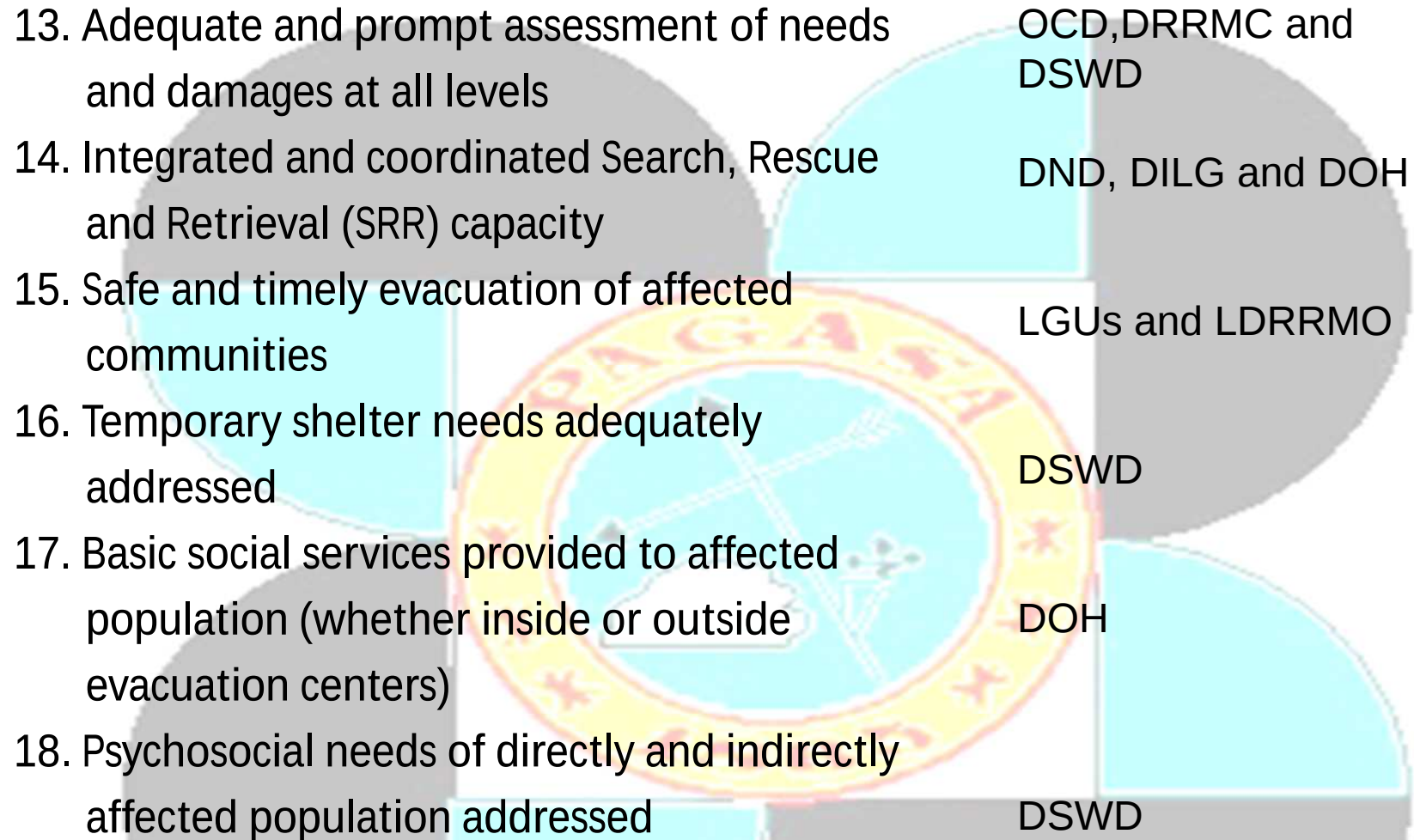
DILG and
OCD, NDRRMC

DILG

LEAD AGENCY

DSWD



- 
- 13. Adequate and prompt assessment of needs and damages at all levels
OCD, DRRMC and DSWD
 - 14. Integrated and coordinated Search, Rescue and Retrieval (SRR) capacity
DND, DILG and DOH
 - 15. Safe and timely evacuation of affected communities
LGUs and LDRRMO
 - 16. Temporary shelter needs adequately addressed
DSWD
 - 17. Basic social services provided to affected population (whether inside or outside evacuation centers)
DOH
 - 18. Psychosocial needs of directly and indirectly affected population addressed
DSWD



Thematic Area 4: Disaster Rehabilitation and Recovery

Overall Responsible Agency: National Economic and Development Authority (NEDA)

OUTCOME	LEAD AGENCY
19. Assessed damages, losses and needs	OCD, NDRRMC
20. Economic activities restored, and if possible strengthened or expanded	Agency to be determined based on the affected sectors
21. Houses rebuilt or repaired to be more resilient to hazard events; safer sites for housing	National Housing Authority (NHA)
22. Disaster and climate change-resilient infrastructure constructed/reconstructed	DPWH
23. A psychologically sound, safe and secure citizenry that is protected from the effects of disasters is able to restore to normal functioning after each disaster	DOH and DSWD



Thank You!



"tracking the sky . . . helping the country"

