

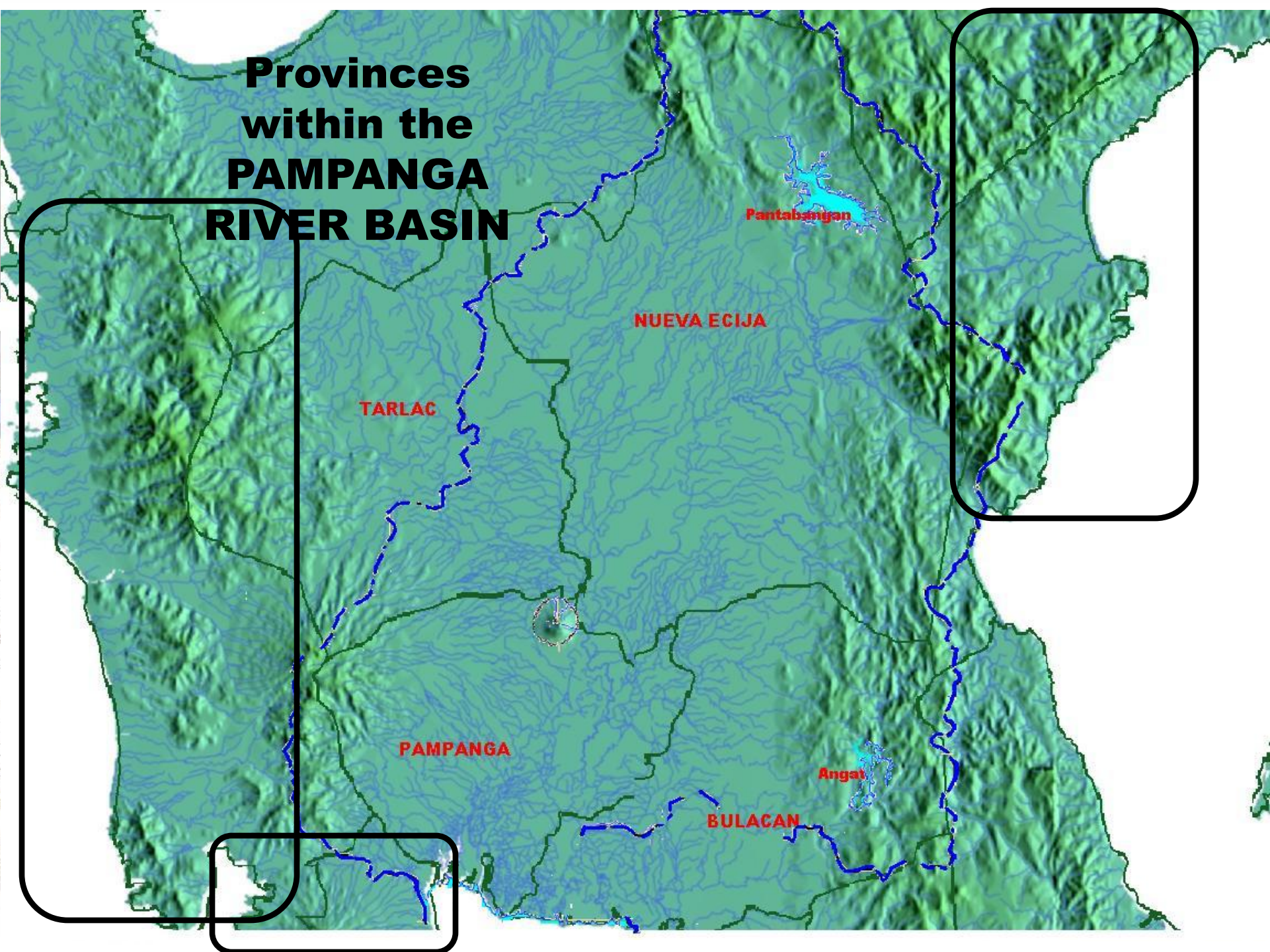
Experiences in the provision of weather, climate-related (& hydrological-related) information to Regional and Local DRRMCs (Disaster Risk Reduction & Management Councils) in the Philippines



Hilton Hernando
Pampanga River Basin Flood Forecasting & Warning Center
PAGASA



Provinces within the PAMPANGA RIVER BASIN



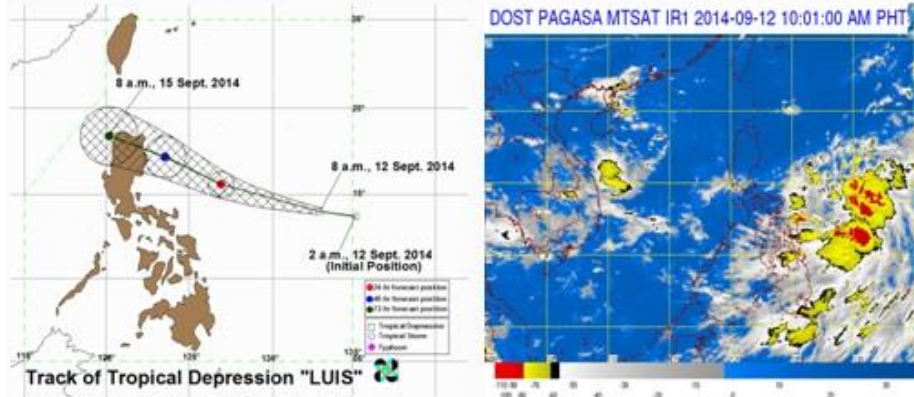
Typhoon "Lando" (Koppu) Oct. 2015



The Pampanga River Basin Flood Forecasting & Warning Center (PRFFWC)



SEVERE WEATHER BULLETIN NUMBER TWO
TROPICAL CYCLONE ALERT: TROPICAL DEPRESSION "LUIS"
 Issued at 11:00 a.m., Friday, 12 September 2014



Tropical Depression "LUIS" has slightly intensified over the Philippine S

Location of Center: (as of 10:00 a.m.)	780 km East of <u>Virac</u> , Catand
Coordinates:	14.0°N, 132.2°E
Strength:	Maximum sustained winds of 55 kph r
Movement:	Forecast to move West Northwest
Forecast Positions/Outlook:	Saturday morning: 480 km East of Casiguran, A Sunday morning: 180 km Northeast of Casiguran, Monday morning: 70 km West Northwest of Lao;

No Public Storm Warning Signal

Estimated rainfall amount is from 7.5 – 15 mm per hour (moderate - heav
 km diameter of the Tropical Depression.

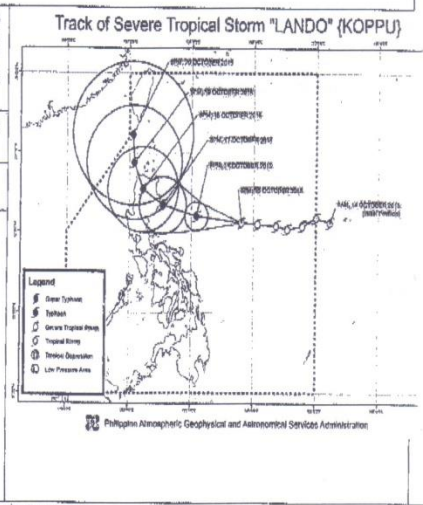
The public and the disaster risk reduction and management council con
 advised to take appropriate actions and watch for the next bulletin to be
 today.

SEVERE WEATHER BULLETIN #4
FOR: SEVERE TROPICAL STORM "LANDO"
TROPICAL CYCLONE: ALERT

ISSUED AT 11:00 PM, 15 OCTOBER 2015
 (Valid for broadcast until the next bulletin to be issued at 5 AM tomorrow)
**SEVERE TROPICAL STORM "LANDO" HAS INTENSIFIED FURTHER AND NOW POSES AN IMPENDING
 THREAT TO ISABELA-CAGAYAN AREA**

- Estimated rainfall amount is from moderate to heavy within the 500 km diameter of the severe tropical storm.
- Fisherfolk are advised not to venture out over the northern and western seaboard of Northern Luzon.

Location of eye/center:	At 10:00 PM today, the center of Severe Tropical Storm "LANDO" was estimated based on all available data at 775 km East of Baler, Aurora (15.6°N, 128.8°E).
Strength:	Maximum sustained winds of 105 kph near the center and gustiness of up to 135 kph.
Forecast Movement:	Forecast to move West at 15 kph.
Forecast Positions:	<ul style="list-style-type: none"> • 24 hour (Tomorrow evening): 410 km East of Baler, Aurora • 48 hour (Saturday evening): 80 km Northeast of Casiguran, Aurora • 72 hour (Sunday evening): 65 km West of Tuguegarao, Cagayan or in the vicinity of Lacub, Abra • 96 hour (Monday evening): 115 km West of Calayan, Cagayan • 120 hour (Tuesday evening): 165 km Northwest of Itbayat, Batanes



PUBLIC STORM WARNING SIGNAL				
PSWS	Luzon	Visayas	Mindanao	Impacts of the wind
1 (30-60kph Expected in 36 hrs.)	Isabela, Cagayan, Quirino, Aurora, Quezon including Polillo Island, Camarines Norte, Camarines Sur and Catanduanes			<ul style="list-style-type: none"> • Very light or no damage to low risk structures, • Light damage to medium to high risk structures • Slight damage to some houses of very light materials or makeshift structures in exposed communities. Some banana plants are tilted, a few downed and leaves are generally damaged • Twigs of small trees may be broken. • Rice crops, however, may suffer significant damage when it is in its flowering stage.
Wave Height (Open Sea): 1.25-4.0 meters				
The public and the disaster risk reduction and management council concerned are advised to take appropriate actions and watch for the next Severe Weather Bulletin to be issued at 5 AM tomorrow.				

Prepared by: *JJL*
 Checked by: *RSS*



EL NIÑO ADVISORY No. 6



Moderate El Niño is present in the tropical Pacific Ocean. It is expected to continue and likely to intensify in the coming months.

In June, the weather systems that affected the tropical Convergence Zone (ITCZ), easterlies, and tropical cyclone entered the Philippine Area of Responsibility (PAR) and was associated with weak SW monsoon.

Rainfall assessment from October 2014 to June 2015 were affected by either dry spell or drought. Drought conditions were observed in Metro Manila, Bulacan, Pampanga and Mindanao.

Drought, on the other hand is defined as the reduction from average) or five consecutive months of below normal rainfall condition. Latest rainfall assessment : drought are: Ilocos Sur, Ilocos Norte, Abra, Misamis Oriental, Palawan, Siquijor, Bohol and

Further analysis showed that most parts of experienced way below to below normal rainfall received in Metro Manila, Bulacan, Pampanga and Mindanao.

Slightly warmer than average air temperatures recorded in June. Average ranges of temperature recorded in Luzon, 17 °C to 25 °C for mountainous areas and lowlands of Mindanao and 20°C to 30°C over the

For the month of July, the weather systems the pressure areas (LPAs) and three (3) to five (5) tropical

It is likely that rainfall for July 2015 will be near normal in Luzon, Cebu, Biliran, Samar and Camiguin; while Leyte will likely experience below normal rainfall.

It is also expected that most provinces under drought conditions. However, three (3) provinces namely - still experience drought conditions.

Slightly warmer than average air temperatures recorded in July. Average ranges of temperature recorded in Mindoro Island and Samar-Leyte Provinces. In Luzon, 17 °C to 25 °C for mountainous areas and lowlands of Mindanao, 20.5 °C to 33 °C in the low lands of Luzon, 16 °C - Visayas, 22.5 °C to 33 °C in the low lands of Mindanao.

PAGASA will continue to closely monitor the situation and issue advisories as appropriate. Meanwhile, concerned agencies are urged to take necessary measures to minimize its potential adverse impacts. For further information, contact the Climate Monitoring and Prediction Division (CAD) at telephone numbers 434- 095

VICENTE B. MALANO, Ph.D.
 Acting Administrator

REPUBLIC OF THE PHILIPPINES
 Department of Science and Technology
 Philippine Atmospheric, Geophysical and
 Astronomical Services Administration (PAGASA)
 Science Garden, Agham Road, Diliman, Quezon City 1100

EL NIÑO ADVISORY No. 6

Moderate El Niño conditions continue to persist across the equatorial Pacific Ocean. Leading climate models suggest that it may intensify from moderate to strong El Niño in the coming months (last quarter of 2015) and may last until early 2016.

Weather systems that affected the country during the month of July were the ridge of high pressure area (HPA), inter-tropical convergence zone (ITCZ), Southwest (SW) monsoon, low pressure areas (LPAs) and the passage of three (3) tropical cyclones (TC) over the Philippine Area of Responsibility (PAR), namely: Tropical Storm (TS) Egay (July 2-7) Typhoon (TY) Falcon (July 8-10) and TY Goring (July 23-25) . All these TCs enhanced the SW monsoon and brought moderate to heavy rains and thunderstorms over most sections of the country resulting to landslides and flooding, based on the report of the National Disaster Risk Reduction and Management Council (NDRRMC).

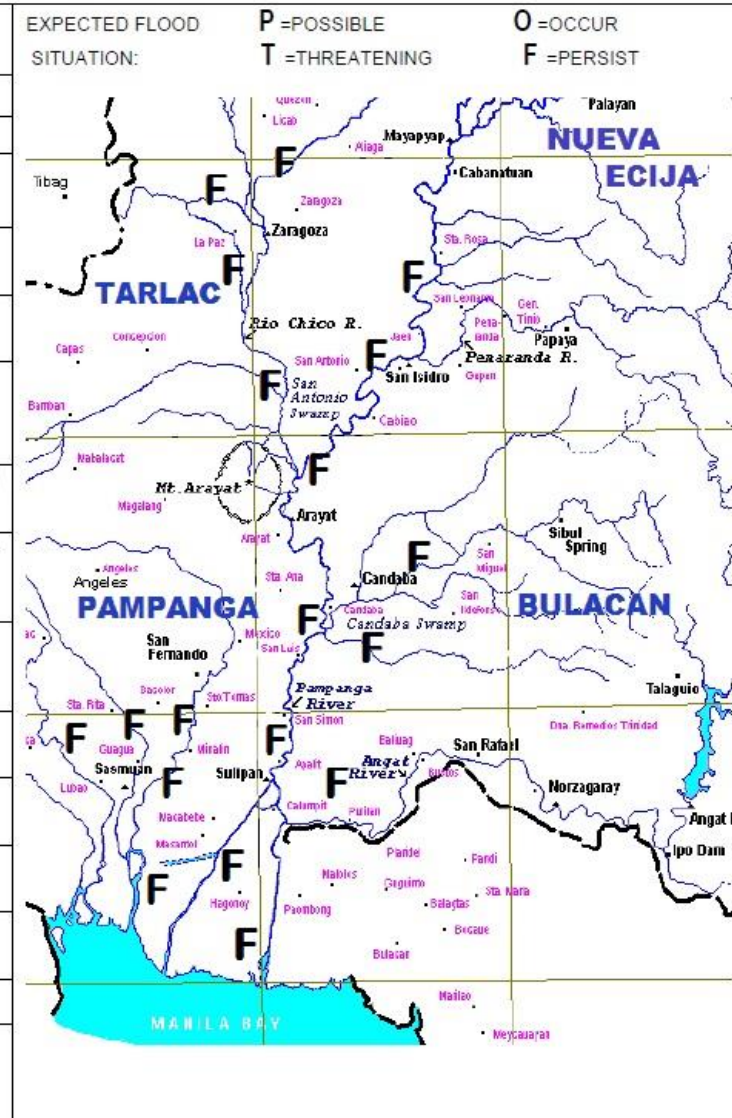
Analysis of rainfall distribution for the month of July showed that near to above normal rainfall were observed over Cordillera Administrative Region (CAR), Ilocos Region, Central and Southern Luzon including Metro Manila, Romblon, Albay, Palawan, Negros Island Region, southern section of Cebu, Western and Central Mindanao. The rest of the country experienced below to way below normal rainfall conditions especially the eastern section of the Philippines, which is a clear manifestation of the impacts of El Niño in the country.

Further analysis showed that the provinces of Aurora, Camarines Norte, Catanduanes, Laguna, Marinduque, Occidental Mindoro, Oriental Mindoro and Quirino were affected by dry spell. Dry spell is described as three (3) consecutive months of below normal (21%-60% reduction from average) rainfall conditions or two (2) consecutive months of way below normal (more than 60% reduction from

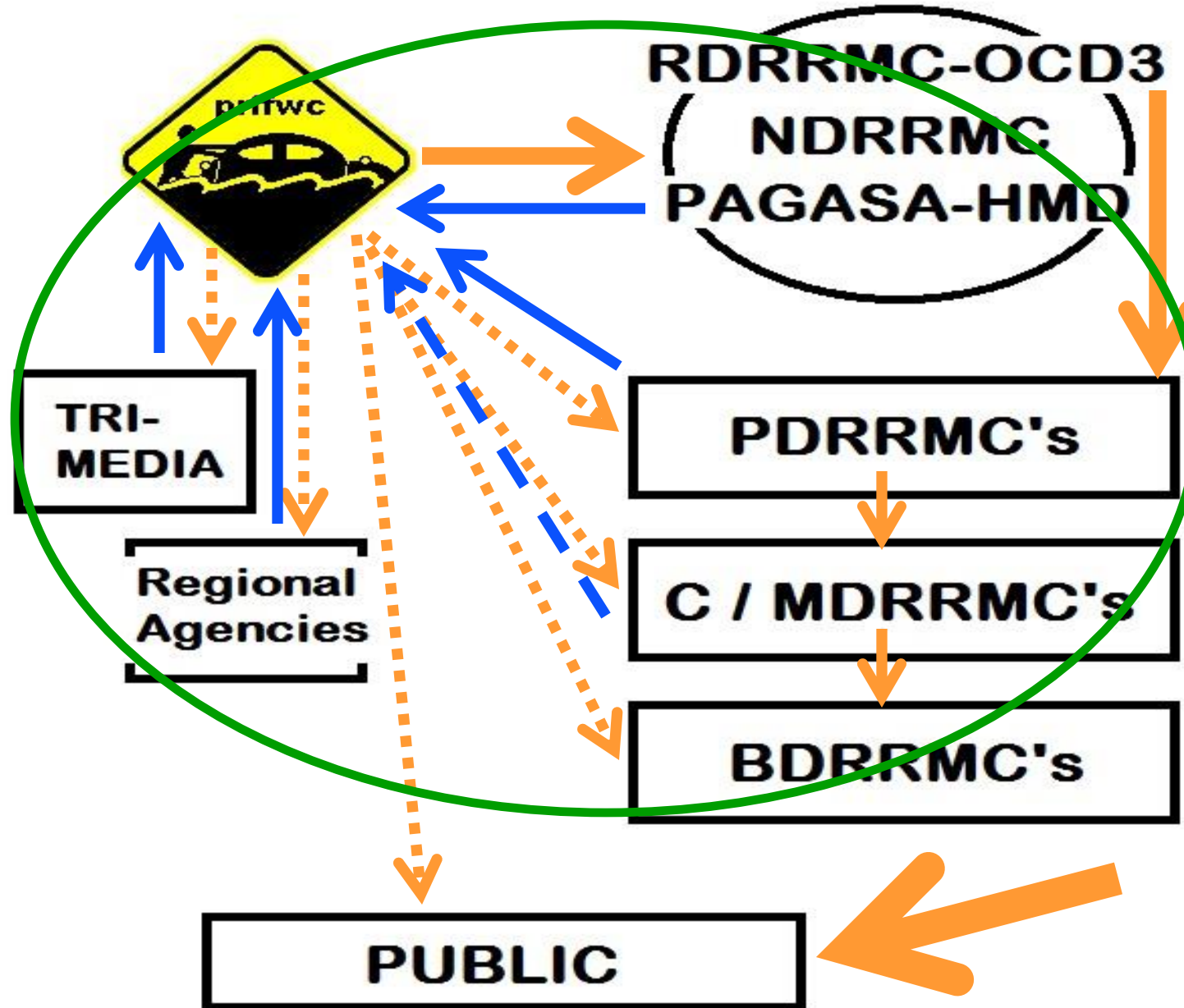


Department of Science and Technology
 PHILIPPINE ATMOSPHERIC, GEOPHYSICAL AND ASTRONOMICAL SERVICES ADMINISTRATION (PAGASA)
 Pampanga River Flood Forecasting and Warning Center, Hydro-Meteorology Division/NCR-PRSD
 Brgy.Maimpis, San Fernando, Pampanga, <http://www.prffwc.webs.com>

FLOOD BULLETIN NO. 7 – PAMPANGA RIVER BASIN AND ALLIED RIVERS			
ISSUED AT: 5:00 PM, 29 SEPTEMBER 2011			
VALID UNTIL THE NEXT ISSUANCE AT 5:00 AM TOMORROW UNLESS THERE IS AN INTERMEDIATE BULLETIN			
BASIN RAINFALL AS OF 5:00 PM TODAY:		FORECAST 24-HR = 3 TO 5 MM	
PAST 24-HR = 3.5 MM			
BASIN EXPECTED RESPONSE:			
WATER LEVEL STATION (STN)	RIVER/ SWAMP WATER LEVEL (WL) TREND AT STATION	FLOOD SITUATION MESSAGE	PARTICULAR LOW-LYING RIVERSIDE AREAS
SAPANG BUHO STN. PAMPANGA RIVER	NOW AT 2.61 M/ CONTINUED SLOW RECESSION BELOW 3.7 M ALERT WL	FLOODING IS NO LONGER EXPECTED TO PERSIST (A FINAL MESSAGE)	LAUR, BONGABONG, PALAYAN CITY, NATIVIDAD, LLANERA, ALIAGA, TALAVERA
MAYAPYAP STN., PAMPANGA RIVER	NOW AT 1.83 M/ CONTINUED SLOW RECESSION BELOW THE 3.0 M ALERT WL	FLOODING IS NO LONGER EXPECTED TO PERSIST (A FINAL MESSAGE)	CABANATUAN, STA. ROSA
SAN ISIDRO STN., PAMPANGA RIVER	NOW AT 5.34 M/ CONTINUED SLOW RECESSION TO REACH BELOW 4.5 M ALARM WL LATE TONIGHT	FLOODING IS EXPECTED TO PERSIST UNTIL TOMORROW NOON	JAEN, SAN ISIDRO, CABIAO, SAN LEONARDO
ARAYAT STN., PAMPANGA RIVER	EXPECTED TO CREST ABOVE 8.50 M CRITICAL WL TONIGHT	FLOODING IS EXPECTED TO PERSIST FOR SEVERAL DAYS	SAN LUIS, ARAYAT, SAN SIMON
SULIPAN STN., PAMPANGA RIVER	NOW AT 4.40 M/ VERY SLOW RISE TO CREST JUST ABOVE THE 4.5 M WL TONIGHT, BELOW THE 5.0 CRITICAL WL	FLOODING IS EXPECTED TO PERSIST FOR SEVERAL DAYS	APALIT, CALUMPIT, MASANTOL, MACABEBE, HAGONUY, PAOMBONG
ZARAGOZA STN., RIO CHICO RIVER	NOW AT 15.10 M/ SLOW RECESSION TO REACH 14.50 M. CRITICAL WL BY TOMORROW AFTERNOON	FLOODING IS EXPECTED TO PERSIST FOR SEVERAL DAYS	SAN ANTONIO, LA PAZ, ZARAGOZA, LICAB, QUEZON
CANDABA STN., CANDABA SWAMP	NOW AT 7.61 M/ TO CREST LATE TODAY, WAY ABOVE THE 5.0 M CRITICAL WL	FLOODING IS EXPECTED TO PERSIST FOR SEVERAL DAYS	CANDABA, SAN MIGUEL, SAN ILDEFONSO, PULILAN
MEXICO STN., ABACAN RIVER	NOW AT 1.60 M/ CONTINUED SLOW RECESSION	FLOODING IS EXPECTED TO PERSIST FOR A FEW DAYS	MEXICO, SAN FERNANDO, STA. ANA, STO. TOMAS, MINALIN
PENARANDA STN., PEÑARANDA RIVER	NOW AT 0.45 M/ CONTINUED SLOW RECESSION	FLOODING IS NO LONGER EXPECTED TO PERSIST (A FINAL MESSAGE)	PEÑARANDA, GAPAN
SASMUAN STN., GUAGUA RIVER	NOW AT 2.83 M/ VERY SLOW RECESSION	FLOODING IS EXPECTED TO PERSIST FOR A FEW DAYS	SASMUAN, LUBAO, GUAGUA
COASTAL FLOODING IN THE LOW-LYING SEASHORE AREAS			HAGONUY, PAOMBONG MASANTOL, MACABEBE
THE RESIDENTS AND THE DISASTER RISK REDUCTION AND MANAGEMENT COUNCILS CONCERNED ARE ADVISED TO CONTINUE TO TAKE APPROPRIATE ACTIONS			
HTH / RPY / JRD / RFD			



Flood Advisory / Flood Bulletins



Info thru the web: e-mail, twitter, FB; etc..

The image shows a screenshot of the Twitter profile for PRFFWC (@PRFFWC). The profile includes a yellow diamond-shaped logo with a car and a person, the name PRFFWC, and the handle @PRFFWC. The bio identifies it as the SFD0 Pampanga Pampanga River Basin Flood Forecasting & Warning Center, with a website link. The tweets section shows several recent posts, each starting with the PRFFWC logo and providing flood-related information, such as flood bulletins and advisories, with dates ranging from July 28 to August 30.

The banner for the PRFFWC website features the title "Pampanga River Basin Flood Forecasting & Warning Center (PRBFFWC)" in white text on a dark teal background. Below the title, it lists "prffwc, PAGASA, DOST". A navigation menu includes links for Home, Who We Are - Background, The Basin System, Basin Map, Photo Gallery, Some basin info (FAQ's), Site-related Documents, Events & Activities, Contact Us, Partners, links, etc..., Personal Messages, Site Disclaimer, and PRFFWC news.

The "Pictures" section of the website displays a grid of six small images. The first image shows a water level gauge, the second shows a dam structure, the third shows a river landscape, and the fourth shows a building. The other two images are partially obscured or less distinct.

The "PRFFWC Data / Information Link" section provides a list of resources. It starts with a logo and a brief description: "Information / Links on Present Philippine Weather (PAGASA) & Hydrological situation of the Pampanga River Basin and its allied river system - Guagua River Basin". Below this, several links are listed in yellow boxes with red text: "Latest Philippine Weather Forecast", "Latest Tropical Cyclone within PAR (Philippine Area of Responsibility)", "Latest Flood Bulletin (PRB & Allied Rivers)", "Latest Hydrological Forecast for Pampanga River Basin", "Latest Flood Advisory (PRB and its Allied Rivers)", and "Latest Status of Rainfall and Water Levels (PRB & Allied Rivers)". At the bottom, there is a link for "Sample Newsletter - NETFLOWS".

**prffwc.webs.com; twitter: @PRFFWC;
prffwc_ffb@yahoo.com; FB accounts**

The "Dam and High Tide info" section of the website provides information about dams and high tide conditions. The text is partially obscured by a watermark.

Complementing activities that will help end-users understand the information further



Localization



PAMPANGA RIVER BASIN AND ALLIED RIVER BASIN OF PASAC-GUAGUA

HYDROLOGICAL FORECAST

October 29, 2015

6:00 AM (LST)

PARTLY CLOUDY TO CLOUDY SKIES WITH ISOLATED LIGHT RAINS WITHIN THE NEXT 24 HOURS. SLOW RECESSION OF WATER LEVEL OF THE MAIN PAMPANGA RIVER. SLIGHT FLOODING AT LOW-LYING RIVERSIDE AND COASTAL AREAS AFFECTED BY HIGH TIDE.

(BAHAGYANG MAULAP HANGGANG SA MAULAP NA KALANGITAN NA MAY PULU-PULONG MAHINANG PAG-ULAN ANG MARARANASAN SA SUSUNOD NA 24-ORAS. MABAGAL NA PAGBABA NG ANTAS NG TUBIG NG KABUUANG ILOG NG PAMPANGA. BAHAGYANG PAGBABAHA SA MGA MABABABANG LUGAR SA DALAMPASIGAN AT TABING-ILOG NA APEKTADO NG "HIGH TIDE")

Downscaling



**Bulacan Province Hydrological Situation as of:
6:00 AM (LST) October 29, 2015**

NORMAL RIVER WATER LEVELS WITHIN THE PROVINCE. SLIGHT FLOODING AT LOW-LYING RIVERSIDE AND COASTAL AREAS AFFECTED BY HIGH TIDE.

(KARANIWANG ANTAS NG MGA KAILUGAN SA LALAWIGAN AY MAGPAPATULOY. BAHAGYANG PAGBABAHA SA MGA SADYANG MABABANG LUGAR SA TABING-ILOG AT DALAMPASIGAN NA APEKTADO NG HIGH-TIDE.)

Workshops...



Taking advantage of Media



Strengthen (continuous) communication links with DRRMO focal person / group



Establish good rapport with the LGU / local DRRMOs



Information(warnings) by memory

Flood level memorials (markers) for flood awareness

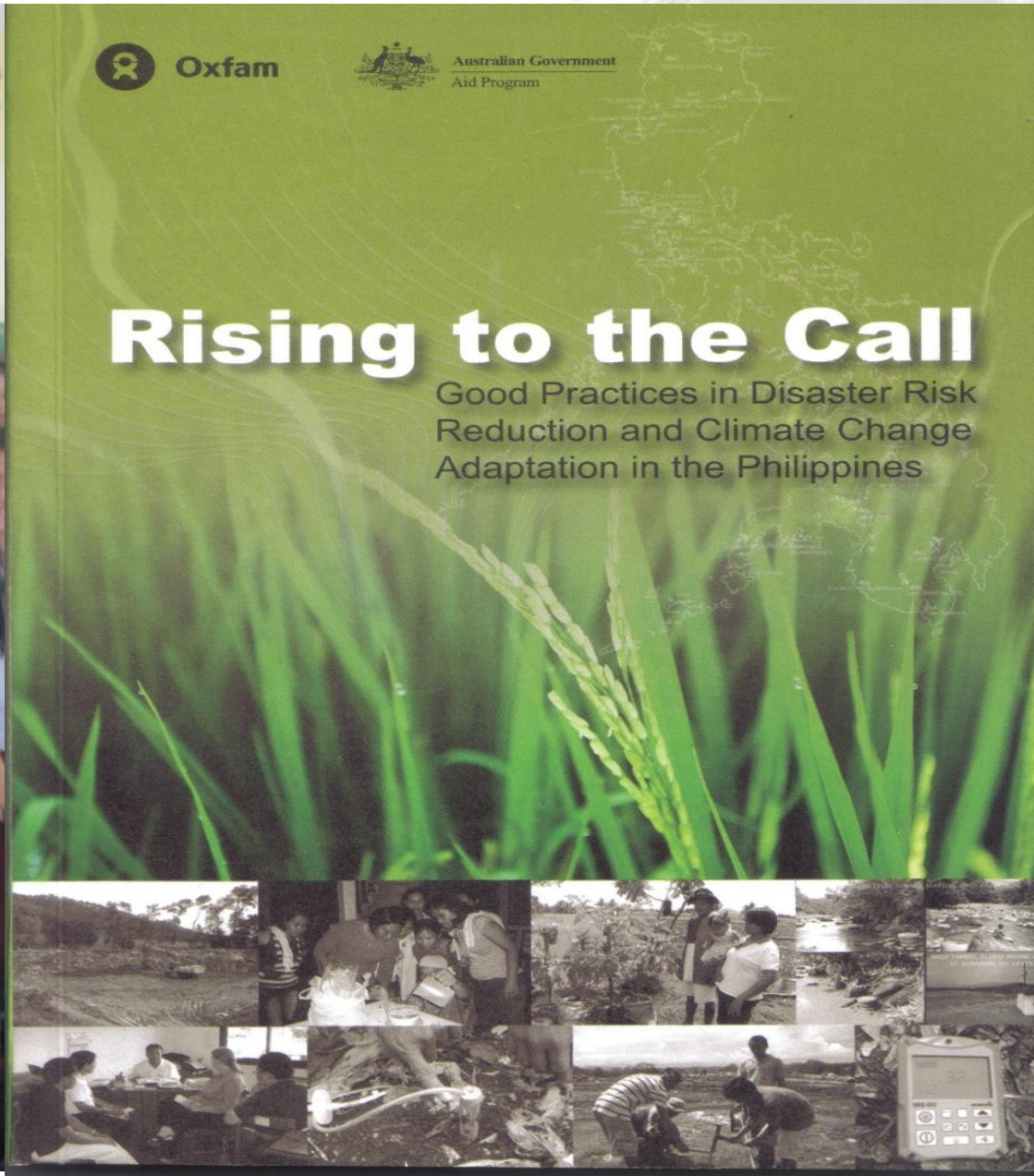


(some) Lessons learned...

- **Each LGU have a different personality**
- **Unable to grasp / understand the info leads to inaction; ..decline in public trust; eventually future info is ignored**
- **Empathize**
- **Communication is an “art”**
- **Accommodate**
- **Events (by memory)**
- **Organizations don't learn, individuals do**
(Berg, 2000)

Ramifications...







Enhance drills, etc.



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SM Baliuag holds flood drill

November 6, 2009 1:50 am

BALIUAG, Bulacan, Nov. 6 — Learning lessons from the devastation suffered by its giant malls in Rosales, Pangasinan and Marikina City, the management and staff of SM City Baliuag on Friday conducted a disaster management drill.

This is in coordination with local and provincial disaster control officials here.

A worse case storm and flood scenario was simulated.

A powerful typhoon (storm signal number 4) with strong winds and heavy rains was wrecking havoc at the mall area which was getting flooded as Angat dam open all its floodgates and released about 4,800 cubic meters per second of water.

Andrew Cristobal, assistant mall manager of SM City Baliuag, said the flood drill aims to foster a disaster-awareness culture among the mall work force and to implement emergency procedures for prompt response during threats of heavy rains and potential flooding in the area.

Cristobal said that prior to the holding of the disaster management exercise, frontliners like security personnel and in-house paramedics underwent a series of trainings and seminars on basic life support and rescue operation.

Bev Cruz, public relations officer of SM City Baliuag, said mall employees, security and janitorial personnel were grouped to be a part of various emergency response units such as rescue and evacuation units, security and crowd control, medical, communications and engineering teams in order to form the disaster management team.

A panel of observers led by Pagasa hydrologist (flood forecaster) Hilton Hernando, Baliuag Municipal Disaster Coordinating Council head Josie Labasbas, Philippine National Red Cross-Malolos district head Donald Maniego and Bulacan Provincial Disaster Management Office senior staff Raul Agustin evaluated the exercise and came up with suggestions for future reference.

Hernando has suggested to Cristobal and Ramon Fernandez, customer relations manager, that in case of flooding it is prudent to open the entrance so that floodwaters can flow easily.

- **Bridging the information (weather, climate, hydrological) gap between the scientific community and its recipients (end-user / decision makers) is not just a matter of simply providing the information...**
- **its more on being able to provide the true essence / meaning of the information;**
- ***“this can be viewed only if the community eventually reacts with an action / activity that addresses the information that was shared.”***

Thank you very much for your attention.



- Pampanga River Basin Flood Forecasting & Warning Center (PRFFWC), PAGASA, DOST
- E-mail: prffwc_ffb@yahoo.com / FB & Twitter accounts
- Webpage: www.prffwc.webs.com / www.prffwc.synthasite.com
- Tel: (045) 455-1701 (City of San Fernando, Pampanga)