Philippine Atmospheric,Geophysical &
Astronomical Services Administration
(P A G A S A)

"we are among the best..."

2014 ANNUAL REPORT

Mandate

"To provide protection against natural calamities and utilize scientific knowledge as an effective instrument to insure the safety, well-being and economic security of all the people, and for the promotion of national progress."

Vision

Center of excellence for weather related information and services.

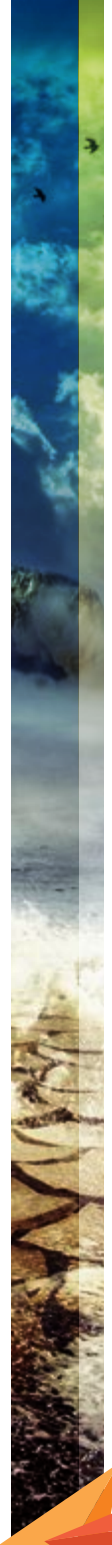
Mission

Protecting lives, properties and livelihoods through timely, accurate and reliable weather-related information and services.

Core Values

Integrity
Commitment
Patriotism

Contents



CITIZEN'S CHARTER

I. Mission/Vision

1. Mission

Protecting lives, properties and livelihoods through timely, accurate and reliable weather-related information and services.

2. Vision

Center of excellence for weather related information and services

II. Performance Pledge and Feedback and Redress Mechanisms:

1. Performance Pledge

We, the professional and dedicated officials and employees of the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), commit to:

Provide service promptly, efficiently and with utmost courtesy by authorized personnel with proper identification from Mondays to Fridays. 8:00 AM to 5:00 PM, without noon break; for Administration support and other similar services and 24/7 whole year round for forecasting services,

Adhere to strict compliance with service standards, with written explanation for any delays in the services we offered;

Give timely response to complaint about our services the soonest and take corrective measures accordingly;

Assure that every client's comments, suggestions and needs are given importance.

Satisfy our customers' needs by acting on their feedback and informing them of any developments first hand;

Allow the public access to information on our programs, activities and services through our website (www.pagasa.dost.gov.ph) or through SMS, and our hotline 927-1335 and 434-2696, FOLLOW US ON TWITTER (dost_pagasa), LIKE US ON FACEBOOK(DOST-pagasa),

Above all, we pledge to serve everyone with utmost honesty, dedication, respect and understanding, for we believe that in so doing, we are also serving and honoring our country and God Almighty.

2. Feedback and Redress Mechanisms

Please let us know how we have served you by:

a. Accomplishing our Feedback Form available at the lobby and put in the drop box located at the front desk or give to the employee of the division concerned.

b. Sending your feedback through our website (www.pagasa.dost.gov.ph) or call our hotline 927-1335 and 434-2696, FOLLOW US ON TWITTER (dost_pagasa), LIKE US ON FACEBOOK(DOST-pagasa)

Your written/verbal complaints shall immediately be attended to.

Thank you for helping us improve our services.

SERVICE STANDARDS

I. Processed Data (Daily Summaries, rainfall maps, etc.)

Who May Avail of the Service : General Public

Fees : Minimum of P1,000 weather certificate first 3 pages
: Php 36.00/yr/parameter for monthly data
: Php 360.00/yr/parameter for daily data

How to Avail of the Service

Step	Client/Customer	Activity	Maximum Duration	Person In Charge
1	Register with the guard and seek the assistance of the personnel from the Section concerned	Attend to the inquiries/needs of the client	30 minutes	Guard/Personnel from Section Concerned
2		Inquire from climate databank the availability of the data		
3	Pay the Cashier at the 3rd floor	Process the request and the customer of the appropriate charges by preparing the Order of Payment	30 minutes	Personnel from the Section concerned
4	Execute conforme that data is to be used only for specified purpose	Release data/maps to client upon presentation of receipt	15 minutes	Personnel from the Section concerned
5	Accomplish Feedback Form	Solicit client's appraisal of services provided	15 minutes	Personnel from the Section concerned

II. Other Services (Calibration, Planetarium Services)

Who May Avail of the Service : General Public

Fees : Minimum of P510 depending on the instrument calibrated
: P25 per person for planetarium services

How to Avail of the Service

Step	Client/Customer	Service Provider	Maximum Duration	Person In Charge
1	Register with the guard and seek the assistance of the personnel from the Section concerned	Attend to the inquiries/needs of the client	30 minutes	Guard/Personnel from Section Concerned
2		Consult with the Division in charge of the desired services	30 minutes	Personnel from the Section concerned
3	Conform with the arrangements discussed	Discuss and finalize arrangement like fees, date services can be provided, the equipment and services needed, etc.	1 hour	Personnel from the Section concerned
4	Pay the Charges to the Cashier	Provide the services agreed upon	1 - 2 hours	Personnel from the Section concerned
5	Accomplish Feedback Form	Solicit client's appraisal of services provided	5 minutes	Personnel from the Section concerned

III. For weather forecast/reports/updates proceed to Weather Division at WFFC Building located a few meters from the PAGASA Main Office

MARIO G. MONTEJO
DOST Secretary

I am proud that the DOST-PAGASA can now be considered as one of the world-class meteorological centers.

During the occurrence of typhoon Ruby in November last year, it had the most accurate forecast as compared to other meteorological centers like the Japan Meteorological Agency (JMA) and the US-based Typhoon Warning Center (TWC). Aside from this, the issued forecasts on the tropical cyclones that entered the Philippine Area of Responsibility (PAR) last year were either near perfect or perfect.

The DOST-PAGASA was also ranked as one of the top four performers among all government agencies in the Executive Outlook Survey conducted by the Makati Business Club.

These recognitions confirm the raised level of accuracy and credibility of PAGASA in terms of issuing weather forecasts. The trust bestowed to the agency is overwhelming as the government and lawmakers have approved the increase of its annual budget under the General Appropriations Act (GAA) to ensure the continuity of its excellent performance in disseminating accurate weather forecasts.

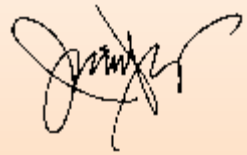
The DOST-PAGASA will continue on improving its services with the ultimate objective of achieving its mandate with flying colors.

VICENTE B. MALANO
Acting Administrator

It is with confidence to say that as far as having modern meteorological and hydrological equipment and facilities is concerned, the DOST-PAGASA no longer lags behind technologically advanced foreign countries resulting in more accurate weather forecasts and warnings. This was clearly evidenced during the passage of Typhoon Glenda and Typhoon Ruby in July and December 2014, respectively, wherein DOST-PAGASA had made near perfect accuracy of forecasts than other international typhoon warning centers. The agency now continues to enjoy the respect of international organizations engaged in disaster preparedness and management.

Major acquisition of modern facilities such as Doppler radars, wind profilers and other state-of-the-art meteorological equipment installed in strategic locations nationwide have further aided the capacity-building of DOST-PAGASA forecasters and upgrading of weather forecasting capabilities. These would not have been possible without the support of our national government and lawmakers providing budgetary requirements to ensure sustainability of DOST-PAGASA's mandate. The trust and confidence accorded the agency by the public and higher authorities is largely due to the excellent performance of DOST-PAGASA in recent years. DOST-PAGASA was ranked fourth (4th) over-all among 62 government agencies by the Makati Business Club in its survey of top performing government agencies in 2014.

Notwithstanding these significant achievements attained during the past year, it is still our firm resolve and undying commitment to continue our noble service to the people to provide protection from natural calamities.



MOVING ONWARD TO TOTAL SERVICES…

Atmospheric, geophysical and astronomical services are essential to every human activity and to national development in a larger sense. With this philosophy, PAGASA continues to be a dynamic organization, not only responsive but also productive, in light of the ever, changing human activities which are accompanied by phenomenon of rising needs. These are also the changing physical environment and the fast progression of scientific and technological development to be reckoned with.

With available resources, both human and physical, at its disposal, the agency has had success in making concrete steps onward to the realization of its inspirations to provide total service to its clientele. The year 2014, saw the completion of the development of new tools, techniques and information references for operational activities in support of enhancing its services. The following section presents the major breakthrough and significant accomplishment for 2014.

Top list of PAGASA 2014

PAGASA CAP through Google Public Alert

The Common Alerting Protocol (CAP) is an international standard format for emergency alerting and public warning. It is designed for "all-hazards", related to weather events, earthquakes, tsunami, volcanic eruption, public health, power outages, and many other emergencies. CAP is also designed for "all-media", including communications media ranging from sirens to cell phones, faxes, radio television, and various digital communication networks based on the internet -WMO. Google as an aggregator for WMO-WIS, with the help of Google as one of authorized aggregators of CAP, a collaboration project with PAGASA Google was signed to speed up the creation of CAP.

Phase I of the project. The PAGASA Technical Working Group (TWG) suggested to start with the Tropical Cyclone Alert (CAP1) and with Tropical Warning (CAP2). CAP 1 is issued to inform the public about tropical cyclones that will not directly affect any part of the country. On the other hand CAP 2 will be issued in case Public Storm Signal is raised (Color Coded). Online interface was created for ease creation on CAP 1 and other interface is still on development for the ease creation of CAP2 (CAP2 would issue a provincial warning in terms of Public Storm Warning Signal (PSWS). The 2nd phase of the project was for expansion to include flood, and storm surge alert. The first phase of the project was completed and launched in November.

PAGASA Technical Working Group (TWG) together with th Google Crisis Response Team

Launching of Google Public Alert in the Philippines in partnership with PAGASA

Google in collaboration with PAGASA has officially launched Google Public Alerts in the Philippines on November 12, 2014 which is an online platform designed to quickly deliver natural disaster warnings to a wide user base and grant them access to critical information during a calamity. It is a platform for disseminating emergency messages and everyday alerts using Google's strength in information and technology aiming to provide the public with information it needs to make informed decisions during critical events such as severe weather disturbances.

Google's engineers sought to improve the information available to users searching for data on any currently occurring disasters in order to mitigate loss to life and property.

Google Public Alerts automatically targets users within the affected zones of any ongoing calamity and provides them with vital information such as storm strength, wind speed and maps showing the direction the weather disturbance.

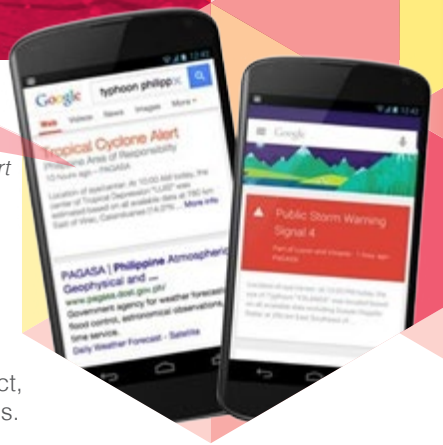
PAGASA Crisis Map

Google Public Alerts work by incorporating public alert data from authoritative sources into Google Search, Google Maps, and other Google platforms and simplifying the process of finding emergency information. Contents come from partner countries such as USA, Australia and Canada. Google is able to provide Public Alerts in the Philippines through the information provided by PAGASA

As of yet, Google Public Alerts only works for weather-based disturbances in the Philippines, since PAGASA is currently the sole provider of crisis information for Google.

Google Public Alerts uses official PAGASA data in their alerts as part of their information-sharing deal.

Google product manager Payal Patel stressed the importance of official and credible information during a crisis. “We noticed this problem that whenever there was an emergency situation, it was hard for our users to find authoritative and useful information in their timeline,” she said.



Tropical Cyclone Alert

The PAGASA Technical Team worked on the project for five months and it is the fastest collaboration of Google amongst the nine (9) partner countries.

The general public can view detailed information about storm such as the location, strength, movement and impact, as well as recommended actions and precautionary measures.

By providing readily-available online data, Google Public Alerts actually complements the existing information released by PAGASA thru its website and other social media accounts.

The PAGASA Technical Team together with the Google Team during the launching of Google Public Alerts

Re-Establishment of Social Media

Social Media

Social media is the interaction among people in which they create, share or exchange information and ideas in virtual communities and networks. Andreas Kaplan and Michael Haenlein define social media as "a group of Internet -based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user-generated content." Furthermore, social media depend on mobile and web-based technologies to create highly interactive platforms through which individuals and communities share, co-share, discuss, and modify user-generated content. They introduce substantial and pervasive changes to communication between organizations, communities and individuals.

PAGASA Twitter Account (@dost_pagasa)

Brief History of PAGASA Social Media

On October 15, 2010, PAGASA Twitter was launched under the username @dost_pagasa upon the directive of DOST Undersecretary Graciano P. Yumul, OIC, PAGASA.

PAGASA Social Media (Facebook/Twitter)

Due to public demand, upon the start of the rainy season in 2011, former Administrator Nathaniel T. Servando directed to create a new social media account using another platform this time it was Facebook. The PAGASA Facebook account was created and the official twitter was activated.

PAGASA Facebook was under the supervision of the Weather Division (WD) especially the forecasting section. Due to lack of protocol and policy about management of this account some problem arises. First, what is the information must be on the official Facebook account thus this represent the whole PAGASA or just the forecasting? Who can access and used the said account or Administrator privileged problem? With this problem argument arise and the account was loss it access and totally locked from 2011.

With the development only the twitter account of the two divisions namely the Weather Division and Hydrometeorology Division (HMD) was active during the rainy season of 2012.

On December 02, 2012 Administrator Nathaniel Servando directed to revived or create new Facebook account for PAGASA. On the midst of Typhoon Pablo the new PAGASA Facebook account was been live again with the support of communication group from Malacanang. With development of Rainfall Warning System (RWS) PAGASA official Face book and twitter account are now manage by National Capital Region –PAGASA Regional Services Division (NCR-PRSD) personnel.

Inside Facebook Page and Twitter

Total of 487, 903 Facebook fans and over 1.15 Million Twitter Follower

Spike during August and November 2013 shows that Face book increases during inclement weather.

Moving forward 2013

Inside Face book Page and Twitter. A total of 487,903 Facebook fans and over 1.15 Millions twitter followers, statistics and analytics show that people are more visual and like to engage in terms of Photo post. We can
see that people are active online during noontime and reach to 167K during the 10 pm. People engagement increases the total number of reach or the number who saw out post.

Recommencement of Social Media 2014

A Social Media Team was re-established to promote the PAGASA brand as the preferred provider of weather and other related services, to be more visible, more effective and interactive with all stakeholders and clients. With the re-establishment of a Social Media Team of PAGASA, the forecasting section of PAGASA can easily communicate the information to the people with internet access and use social media. While not all people use social media, still it's a great gateway for information to keep updated, specifically, during inclement weather. The PAGASA Social Media Team was created to be responsible to communicate with stakeholders and clients nationwide. This response is one of the strategies to promote the PAGASA brand as the preferred provider of weather and other related services, and advocates for sustainable support.

Sleeker look for the new PAGASA website

Yes, the color is still blue, but it is bolder and livelier.

The new look of the officially launched PAGASA-DOST website is just one of the many improvements that PAGASA is doing for its products and services.

Incorporating some of the features from the old website, the new PAGASA website features rich graphics and colorful icons that are easier to identify, making it more user-friendly.

Netizens can immediately see the different weather advisories through the scrolling panel in the homepage, as well as the tweeter advisories from PAGASA.

Beyond Statistics and Analysis

Spike during August and November 2013 shows that Facebook increases during inclement weather

The New PAGASA Website

The interesting part of the website is the pop-up advisory on the Tropical Cyclone Update. Once users visit the website, the advisory will automatically appear on the screen.

The press launching of the PAGASA website saw the signing of a Memorandum of Understanding (MOU) between PAGASA and the LGU, in cooperation with the civil society group, Rice Watch and Action Network (R1), and international humanitarian organizations, Oxfam and Christian Aid.

The partnership aims to assist local government units (LGUs) in the Visayas and Mindanao to integrate climate change adaptation in agriculture and disaster risk reduction management (DRRM) in local development plans, through a program entitled Climate Resiliency Field School (CrFS) Farmers' Access to Early Warning System (EWS) with Climate Change Adaptation (CCA) Techniques in Farming.

The press launching and MOU signing were part of the activities during the celebration of 2014 World and National Meteorological Day (WMND) by PAGASA.

Met-hydro Decision Support Information (MDSI)

The PAGASA responded to the need to provide a solution to the requirement for an integrated web-based Information System that will integrate majority of the agency's observation data and products in a very short period of time, or roughly around three (3) months since it was conceived in July 2013. Thus, the PAGASA ETSD-ICT team conceptualized the Met-hydro Decision Support InfoSys (MDSI) or better known as "meteopilipinas" last year.

The MDSI integrates all available Automatic Weather Station as well as Automatic Rain Gauges from project initiatives; the system includes the establishment and hardware upgrading of the PAGASA File Transfer Protocol (FTP) with high availability platform. It also includes the establishment of a robust SMS collection server that caters to all SMS-based data reception for AWS and ARG. One of the highlights of MDSI, is the integration of radar imagery from Doppler radar stations on a Google Application Programming Interface. This is the heart of MDSI wherein near real-time display is layered with radar images, satellite images, typhoon forecast track and recently added, "Station plots".

PAGASA Met-Hydro Decision Support Infosys (MDSI)

Launching of PAGASA website, Mr. John Bryan M. Peconcillo presenting the new look of PAGASA Website

The MDSI has come a long way in providing a web-based Met-Hydro Decision Support Information System that will cater to the needs of our forecasters and meteorologists and the public as well. It is still in the process of upgrading with the addition of vital met-hydro information that will address warnings for

MDSI Display of a Typhoon Track with Automatic Rain Gauge (ARG) data

severe weather conditions through the incorporation of HDSS radar products from the PAGASA Integrated High Performance Computer (iHPC), VIL data from the EDGE radar workstations and WRF products from the IHPC Leads On-line display which is available only in a closed network at the WFFC.

We believe that PAGASA has responded to the needs of the agency for an immediate response to produce locally an Information System which is cost effective and 100 percent product of PAGASA Technical- Information Communication Technology (ICT) and at the same time, provided financial savings in the implementation of the MDSI Information System.

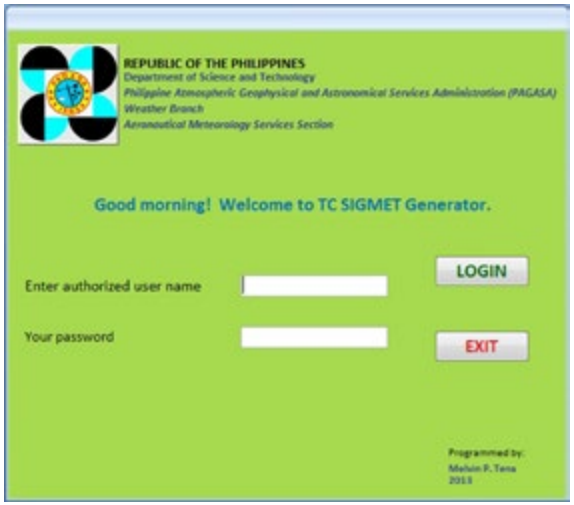
MDSI Display of Typhoon Track & ARG Data

MDSI Display of Satellite Image Overlay

MDSI Display of Surface Observation Station Plot

TROPICAL CYCLONE (TC) SIGMET GENERATOR

It is interactive application basically designed to facilitate the timely issuance of accurate and properly formulated TC SIGMET (TC SIGMET is a kind of warning or advisory for the safety of aircraft operations). It is capable of providing visual presentation of TC's position through time. It stores SIGMET in database for easy retrieval



Tropical Cyclone SIGMET Generator

Major Services

Printable copy of SIGMET

The Agency, in accordance with its doable mandate and objectives, undertook various projects and activities through its different organizations units. Some significant results of these projects and activities, grouped into key programs areas, are discussed in the following sections:

Weather Forecasting and Tropical Cyclone Warning Services

This program is centered in the operation of the weather forecasting and warning system of the country.

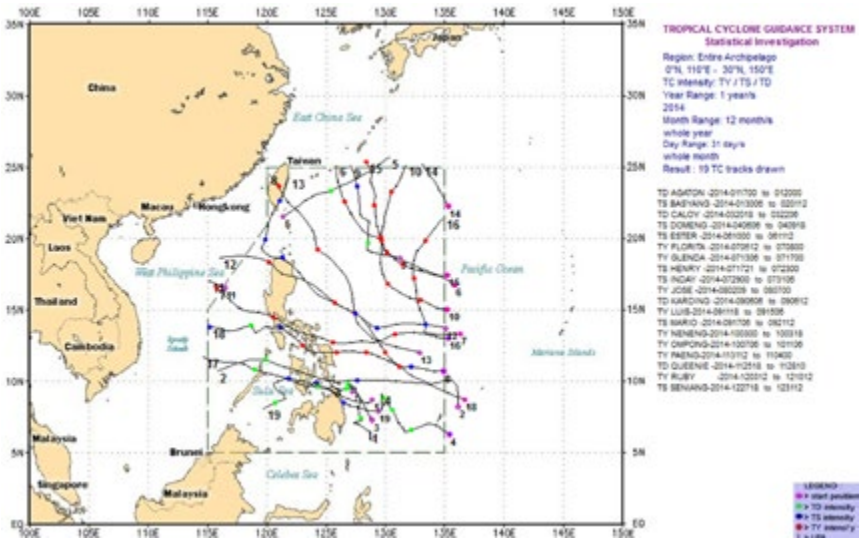
Forecasts and warnings include information on the probable daily weather condition especially during the occurrence of severe weather disturbances, such as tropical cyclones (tropical depressions, tropical storm and typhoons), monsoons, active low-pressure areas and other atmospheric phenomena. The information issued serves as inputs for the day-to-day activities and extended periods for developmental and planning activities, more importantly, for disaster preparedness and response to disaster-causing severe weather phenomena. Beneficiaries of these services include various sectors such as education, agriculture, tourism, trade & commerce air/sea and land transportation and other industries.

The program entails observation, collection and compilation of weather data and information acquired from local and global networks. These data are then plotted and analyzed on weather maps for the formulation and issuance of weather forecasts, advisories and warnings, when warranted. The transmission of data and information utilizes a nationwide telecommunication network and communication link with global meteorological telecommunication institutions.

During the year, eighteen (18) tropical cyclones entered the Philippine Area of Responsibility (PAR) namely: TD Agaton (Jan. 17-20), TD Basyang (Jan. 30-Feb. 1), TD Caloy (March 21-22), TS Domeng (April 6-10), TS Ester (June 10-11), Ty Florita (July 5-8), Ty Glenda (July 13-17), Ty Henry (July 18-23), TS Inday (July 29-30), Ty Jose (Aug. 2-7), TD Karding (Sept.6), Ty Luis (Sept. 12-15), Ty Mario (Sept. 17-21), Ty Neneng (Oct. 3-4), Ty Ompong (Oct. 7-11), Ty Paeng (Oct. 31-Nov.4), TD Quennie (Nov. 26-28), Ty Ruby (Dec. 3-10) and TS Seniang (Dec. 27-31). Six (6) of these tropical cyclones made landfall or crossed the Philippine landmass and brought havoc to the country. The landfalling tropical cyclones are: Tropical Storm "Basyang (Jan 30-01 Feb), Typhoon "Glenda"(Jul 13-17), Typhoon "Luis"(Sep 12-15), Tropical Storm "Mario"(Sep 17-21) and Tropical Storm "Quennie"(Nov 26-28) and Typhoon "RUBY" (Dec 3-10).

TS Mario enhanced the Southwest Monsoon (Habagat) such that excessive rainfall that resulted to widespread flooding in Metro Manila and surrounding provinces was experienced.

Tropical Storm Ruby made four landfalls which



2014 Tropical Cyclone Track

brought widespread damage to the country after cutting across Eastern Samar, Batangas , Mindoro, and Metro Manila. PAGASA closely monitored the occurrence of TC with timely issuance of bulletins and hourly updates of the position of the TC . The general public was able to prepare in advance. This resulted to minimal loss of life and minor agricultural and economic damage.

Benefits gained through the provision of forecasting and warning services, in terms of preparedness and mitigation of the adverse impacts of tropical cyclone may not be expressed in concrete terms, but these undoubtedly were of great help to the communities in reducing of losses. The immeasurable gains redounded to the benefits of the concerned communities, in particular, and the nation in general. Figure 1 shows the track of the TC that entered PAR in 2014. Close tracking and more objectives analyses as prognoses of the TC, made possible with the newly developed 152, produced fairly accurate weather disturbances, weather advisories and severe bulletin which were issued early enough to provided ample time for the general public and concerned disaster preparedness and response authorities to do necessary response. PAGASA has also provided specially packaged weather information for Mt. Mayon, Mt. Bulusan and other selected areas.

Implementation of ongoing projects continued for the upgrading of forecasting and warning system of PAGASA; Development of Nowcasting in Metro Manila, Establishment of Doppler Weather Radar Network for National Weather, Watch, Accurate; Forecasting and Flood Early Warning, under the Disbursement Acceleration Program (DAP)-GOP funded, and Enhancing the Forecasting and Warning Capabilities of PAGASA through Effective Utilization of Weather Data – JICA -TCP.

Flood Forecasting and Hydro-meteorological Services

Non-Project Grant Aid (NPGA Bicol Project): Improvement of Capabilities to Cope with Natural Disasters Caused by Climate Change (Strengthening of Flood Forecasting and Warning System in the Bicol River Basin)

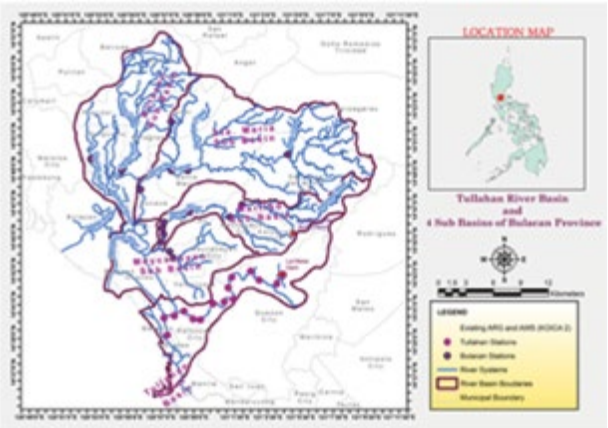
The Project aims to improve and upgrade the structures and equipment of the existing facilities for Bicol River Basin Flood Forecasting and Warning System (BRBFFWS). The BRBFFWS started its operation in 1983 as part of the Agno, Bicol and Cagayan (ABC) FFWS) Project. The BRBFFWS consists of a network of 6 combined rainfall and water level gauging stations, 2 rainfall stations and 2 repeaters stations. Operating for more than 20 years, the BRBFFWS has already exceeded its shelf-life and compounding the challenges in the operation and maintenance of the system are the numerous environmental and social changes in its area of operation. Owing to the recurring flood of varying magnitude that contributed to the changes in the hydrological characteristics of the Bicol River Basin, there is a pressing need to improve the existing flood forecasting and warning system, including the telecommunication system. Flood forecasting and warning is considered one of the most economical

interventions of mitigating the negative impacts of flooding and will also stand to supplement the structural measures of flood mitigation and other river basin management intervention.

The Bicol Project will further enhance the forecasting capabilities of the Bicol River Basin FFWC as additional stations will be established that will be able to provide the better information on the hydrological condition of the whole basin during inclement weather condition. The backbone of telecommunication network will also be upgraded to ensure less interference thus provide speed and reliability on data transmission.

Automation of Flood Early Warning System for Disaster Mitigation in Greater Metro Manila (EWS3 Project)

In order to address the need for a more extensive and sturdy flood monitoring and warning system for Metro Manila, the EWS3 Project was prepared and submitted to the Korean International Cooperation Agency (KOICA) for funding. The recurring flooding problem in Metro Manila continues to affect the lives and livelihood of the communities, causing the disruption educational, economic and industrial activities, including its nearby environs. For a highly urbanized and thickly-populated area like Metro Manila, an automated early warning system is vital as this will provide enough lead time for the affected communities to undertake preventive measures.



The EWS3 will be an extension of the KOICA 2 Project which provided the early warning system for Pasig-Marikina. The allied rivers of Metro Manila and its nearby surroundings like Bulacan are also subjected to yearly flooding and thus pose an urgency for the establishment of an early warning system for flood. The KOICA has already dispatched a Team of Experts to define the scope of the Project. With the expansion of the NCR-PAGASA Integrated Flood Information Control System (PAGASA-PIFICS) to monitor the water ways within Metro Manila and its vicinities, the EWS3 Project will be an essential tool in the flood warning activities of the HMD as well as the DRR activities at the local level.

Enabling the Cities of Cagayan De Oro and Iligan and the Provinces of Compostela Valley and Davao Oriental to cope with Climate Change (Twin Phoenix Project)

The Twin Phoenix Project was implemented by the Climate Change Commission (CCC) in partnership with the United Nations Development Programme (UNDP). One of the component of the Project is the establishment of a flood early warning system (FEWS) in areas that were greatly affected by the passage of Typhoon Sendong in 2011 (Cities of Cagayan De Oro and Iligan) and Typhoon Pablo in 2012 (Compostela Valley and Davao Oriental).

CCC partnered with PAGASA for the implementation/ establishment of an operational flood early warning system, which is one of the components of the Project. Activities undertaken by PAGASA to achieve this were tabletop and field surveys of site for the rainfall, water level and repeater stations, development and determining the standard specifications of the monitoring equipment and supervise the installation of the EWS equipment/instruments, conduct of IEC activities for the LGUs and barangays who will host and maintain the system and in the preparation of warning messages for the flood bulletins that will be issued by the PAGASA-Cagayan De Oro River Basin Flood Forecasting and Warning Center, which is currently housed at the Mindanao-PRSD.

Culminating this activity is the conduct of IEC and the ceremonial switching of the system in Cagayan De Oro and Iligan City last December 2014. It was attended by the LGUs of the two cities as well as their respective Local Chief Executives. A flood drill was also undertaken to test how the new monitoring system will be integrated in the contingency plan of the two recipient cities.

Cagayan De Oro IEC and Ceremonial Switching of the System

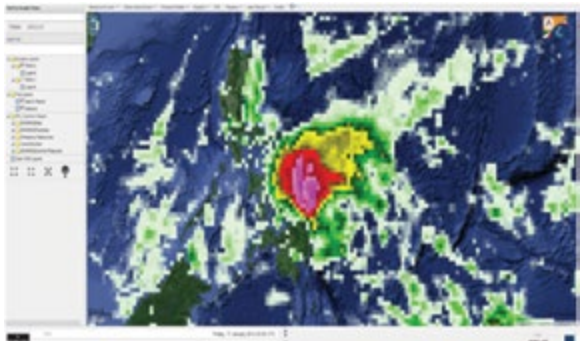
Flood Drill at Brgy. Macasandig, Cagayan De Oro

Iligan City IEC and Ceremonial Switching of FFWS

Flood Drill at Brgy. Santiago, Iligan City

An Operational System for Integrated Management and Hydro-Meteorological Information for Disaster Risk Reduction (DEWETRA)

DEWETRA is a new initiative from of the World Meteorological Organization (WMO), which was developed by the International Centre on Environmental Monitoring (CIMA) and now fully operational at the Italian Prime Minister Office–National Department for Civil Protection – "Centro Funzionale Centrale".
DEWETRA Platform is an integrated system for real-time monitoring of hydro-meteorological and other environmental hazards, which can be utilized for risk forecasting and eventually, paving the way for preparedness and mitigation. Through Graphic Interface, the software provides high-resolution information that are continuously updated, allowing



the user to track weather events, build detailed risk scenarios and evaluate its potential impacts on communities and infrastructures. The use of DEWETRA is being encouraged by the WMO as an operational tool since it will provide a platform to improve the capabilities of the national met-hydro agencies in terms of forecasting, monitoring real-time information and modelling. It will also address concerns on inter-operability of data and forecast models that can be integrated with vulnerability and risk maps and thus produce real-time scenarios.

Upon recommendation and collaboration of PAGASA with WMO, DEWETRA found its way to the Philippines thru the Agency's Hydrometeorology

Division. Computer system and appropriate server were installed at the HMD Main Operation Centre and Hydrologists and the IT Personnel worked closely with the CIMA for the assimilation of the PAGASA products in DEWETRA platform. WRF data such as rainfall, wind and temperature had been successfully viewed in the platform. Continuous assimilation of other PAGASA data and outputs, especially the river basin information, are being done. To ensure that other concerned agencies would be able to access the information thru the DEWETRA, a workshop was conducted by the Italian Experts to provide on-site assistance on the installation and configuration of the system as well as how it can be utilized in the DRR activities being carried-out by the respective agencies.

Partners for Resilience (PfR/ACCORD Project)

Under this collaborative undertaking, PAGASA is providing the technical assistance, particularly in the conduct of field survey (hydrographic survey) and in the training component of the ACCORD Project.

PAGASA participated in the training of as Resource Speaker for the Community Based Early Warning System for the staff of all implementing partners for PfR, which includes different chapters of Red Cross, other NGOs, etc. It was designed to improve the capacity of all the staff of implementing partners to work with communities on risk reduction and preparedness for flood and other risks. Another activity participated in by PAGASA is in the conduct of community drill in one of the project sites of ACCORD: Brgy. Portero, Malabon. The said activity was participated in by the four (4) of the most flood-prone puroks in the barangay and its main objective is to test the barangay's Flood and Typhoon Contingency Plan. On the over-all evaluation, the community drill proved to be a good exercise for the community to see the gaps and needs that could be addressed as well as some improvements in their contingency plan. The whole BDRRMC had displayed full support and cooperation to the activity.

The ACCORD also conducted the Ugnayan and Bahaginan: Building Resilience through Good Governance, a forum among LGUs within their project sites and other related agencies. PAGASA. Recognizing the need to incorporate doable strategies on DRR, climate change adaptation and ecosystem/ river basin management, the forum served as an avenue for presentations and discussions which are aimed to capacitate the community to face the disaster with proper preparations and counter measures.

JICA Technical Cooperation Project for the Strengthening Capacity of Comprehensive Data Management of Flood Forecasting and Warning System (FFWS) through Strategic Formulation of Hydrometeorological Information System

The new TCP was approved by JICA for implementation and it will have a 3-year duration. The Project is aimed to develop a central data management system for all hydrological data at the Main Operation Center, taking into consideration the importance of quality

management due to the different format and storage condition of the existing data. The data management system should be flexible enough to accommodate future expansion of the hydrological monitoring system. As PAGASA is set to expand the flood forecasting and warning services that will cover the other major river basins, there is an underlying need to have an independent data management system at river center for flood forecasting and warning activities and these data should be simultaneously transmitted to the HMD Central Database Management System for archiving purposes and other research undertakings.

Though there is an on-going PAGASA project with similar genre, the new TCP will ensure redundancy of hydrological data that are vital for flood warnings, in the event that there is a system breakdown. In order to avoid duplication, all the detailed contents of the TCP will be agreed upon as the PAGASA central database management system had been completely installed, tested and commissioned.

Development and Implementation of User-Relevant End-to-End Hydrological Forecast Generation and Application System for Disaster Mitigation in the Philippines

This new collaborative undertaking with the Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES) is aimed at developing a user-relevant end-to-end forecast generation and application system that could be demonstrated over key areas in Luzon, Visayas and Mindanao. Objectives of the Project includes the development of a system that will generate the long-lead location specific hydrological forecast, preparation of a customized rainfall-run-off models for selected river basins in the Luzon, Visayas and Mindanao and the development of a Decision Support System (DSS) for PAGASA to be able to communicate relevant information that will be used by planners and decision makers.

The Project started with the signing of a Memorandum of Agreement between PAGASA and RIMES on the scope of the project, such as the respective deliverables, capacity building, conduct of survey and other field works (as necessary), designation of counterpart personnel who will closely work for the Project, etc.

As the Project also include the provision of monitoring equipment for rainfall and water level, site survey was conducted, where PAGASA selected the Jalaur River Basin. It should be noted that with the completion of the Iloilo Radar Station and the eventual establishment of the Jalaur River Basin Flood Forecasting and Warning Center in the said station, the operationalization of an operational/functional flood early warning system could be realized with the installation of the monitoring stations.

Early detection for flashfloods

Flooding cannot be stopped, but it can be predicted in advance.

Through the establishment of the early warning system called Flash Floods Alert System (FFAS), PAGASA can now forecast the occurrence of flash floods.

In the recent signing ceremony of the Memorandum of Agreement (MOA) between PAGASA and the National Disaster Management Institute (NDMI), it is agreed that FFAS will be installed initially in Northern Mindanao.

NDMI is a division of the National Emergency Management Agency (NEMA) in the Republic of Korea. NDMI hosts international education and training programs for government officials and civilians from other Asian countries.

Dr. Woon Kwong Yeo, the president of NDMI, briefly shared their previous activities conducted in the Philippines. He said that NDMI is happy to underwrite the alert system that can help save people's lives.

The installation of the FFAS is part of a plan that will promote the Northern Mindanao Project. The project initiated by NDMI aims to reduce disaster risks in the Mindanao region and strengthen the resilience of the community.

Dr. Vicente B. Malano, Acting Administrator of PAGASA, expressed his appreciation for the MOA signing, sealing the close collaboration and engagement between NDMI and PAGASA. "This system showcases the advanced technology of the government of South Korea in terms of information and communication technology and disaster risk reduction", Dr. Malano said.

By collecting the rainfall amount and the level of streams in a particular area, the FFAS can provide the potential threats of flashfloods and be able to alarm the community, giving them lead time for evacuation.

For two consecutive years from 2011 and 2012, Mindanao was hit by strong typhoons that caused widespread flooding in the region resulting to heavy damage to properties and infrastructures with thousands of lives lost. Aside from the existing warning systems of PAGASA, the FFAS will greatly aid the Agency in predicting the probability of flashfloods in Mindanao, and eventually in the whole country.

Climatological and Agrometeorological Services

The Climatological and Agrometeological Division (CAD) of PAGASA has consistently carried out services for the agricultural sector through the dissemination of vital agro-meteorological information for the farmers for farming activities and proper farm management and necessary planning. Farmers make use of this information to increase income by avoiding weather induced losses and prevent unnecessary waste of time and material input. For the semester, 180 (English), 180 (Tagalog) and 180 live broadcast a total of 540 Daily Farm Weather Forecasts and Advisories (FWFA) were issued to 70, 620 recipients. Likewise, 10-day Regional-Agro weather forecasts and advisories for agriculture 18 were issued and 1,620 copies disseminated while eighteen (18) Philippine Agroclimatic Review & Outlook and one Seasonal Climate Outlook were also issued and 2,700 copies disseminated. Other beneficial climatological information was also published.

Increasing demand for climate forecasts as important inputs in agricultural planning for climate sensitive crops, such as rice and corn during the occurrence of extreme climate events, has been observed. Since the Philippines relies chiefly on rice and corn as

staple food, the application of climate forecasts for agriculture will be replicated in all the agricultural areas across the country. In addition, agro-meteorological research stations will be established in state colleges and universities to obtain the database as well as the information for studies on cropping calendar, plant pest and disease control. Increase collaboration on improving crop yield must be strengthened with state universities and colleges.

Communicating Climate Information For User-Groups

PAGASA, the nation's hub for climate and agrometeorological information, issues seasonal forecast, daily farm weather forecast, 10-day regional agriweather, and El Niño Southern Oscillation (ENSO) advisories. These information serves to guide user groups such as: water planners, food security agencies, public health officials, and farmers among others to help them prepare and mitigate negative impacts of climate variability or take advantage of its benefits. PAGASA hand in hand with the Department of Agriculture and other line agencies provide the public with seasonal climate information on regular basis.

2014 Innovation Award - Climatology and Agrometeorology Division

The National Climate Outlook Forum is being conducted by the Climatology and Agrometeorology Division (CAD) under the Climate Impact and Prediction Section (CLIMPS) to give an update on the Weather and Climate Outlook for the next coming months of the year. The regular presentations included are: (1) Latest Weather Update and Weather Outlook for the next 3 to 5 days; (2) Status of Monitored Major Dams; (3) Review of the Climate Conditions; (4) Climate Outlook for the next 6 months; and an (5) Open Forum, where the participants can give suggestions, comments, and recommendations for the continuous improvement of the PAGASA climate products and services. The forum serves as an avenue for the clienteles and PAGASA as well to exchange ideas, information, and to render/deliver also their respective products, services, works and functions with excellence. This initiative is incorporated in the yearly activity of PAGASA in order that the public would be more aware of the weather and climate scenarios and as one of the responses to the Climate Change thrusts of the country. The symposium also provides a venue where participating agencies to present special lecture relating the importance of the products and services of PAGASA to the main functions of their company/ institutions.

For the year, there are 7 National Climate Outlook Forums conducted at the PAGASA Amihan Conference Room with 589 participants (301 female and 288 male). It was participated by different private and government sectors, industrial and plant companies, individual and group investors on farm and crop plantation, electric, water and other business corporate, academe as well as weather and climate enthusiasts. The forums

Local Climate Forum in Cooperation with Regional Integrated Multi-Hazard Early Warning System for Asia and Africa (RIMES), Dumangas and Iloilo City

were represented by the different divisions and sections of PAGASA.

Likewise, a Local Climate Outlook Forum was conducted at Dumangas and Iloilo City in cooperation with Regional Integrated Multi-Hazard Early Warning System for Asia and Africa (RIMES) on July 30-31, 2014 at Dumangas and Iloilo City with 194 participants (103 female and 91 male).

Astronomical Services

As the country's official time keeper, PAGASA is responsible for maintaining and disseminating the Philippine Standard Time (PST). It operates a precise standard clock from which the setting of time pieces

may be referred. Under normal conditions, the PAGASA Observatory broadcasts time signals every hour on the hour. For the semester, a total of 4,309 time check requests through telephone, mostly in Metro Manila, were accommodated which included synchronization of time for all TV stations in Metro Manila.

To promote Astronomy in the countryside, PAGASA conducted Mobile planetarium, planetarium shows, stargazing and telescoping activities in 9 schools with 2,149 students and science teachers which generated an income of P 20,950.00. Likewise, the agency disseminated 270 astronomical information packages to students and science teachers which also generated an income of P 17,460.00. Majority of the end-users were geodetic engineers, construction and development engineers and those from fishing and other industries. End-users from the academe also availed of some of the publications as teaching aids.

Natural Disaster Preparedness and Mitigation Services

PAGASA remains at the forefront, among concerned agencies, in formulating strategies to combat the effects of natural calamities. One proven strategy is the vigorous information and education campaign being pushed by the agency to promote awareness on natural hazards. PAGASA regularly conducts lectures on the different hazards, its effects and characteristics. The STRIDE (Special Tropical Weather Disturbance Reconnaissance, Information Dissemination and Damage Evaluation) Team, a quick response group of the Agency that performs activities explicitly expressed by the group's name, conducted field investigation and extended assistance in the mitigation of meteorological hazards and disaster reduction in areas affected by land falling tropical cyclone, tornadoes, store surge, etc. During the year the team conducted an investigation on the following:

Mr. Robert Z. Quinto, STRIDE Team Coordinator was interviewed after the passage of Ty Ruby (left photo) and Ty Glenda (right photo)

During Passage of Tropical Cyclones

- TY GLENDA - July 13 - 17, 2014 at Region 4 & 5 RZ Quinto, JC Mendoza IV, T Santos and NA Robo
- TY LUIS- Sept 12-15, 2014 at Northern Luzon. WH Tuazon, MP Guzman, CP Ancheta Jr. and R Cuenca.
- TY GLENDA – Dec 3 - 12, 2014 at Samar Island RZ Quinto, CP Ancheta Jr, RL Siojo and NA Robo

- Deployed STRIDE members at NDRRMC Operations Center Camp Aguinaldo Quezon City as weather briefer during the occurrence of 15 Tropical Cyclone.
- A Reports on TY Glenda, TY Luis and TY Ruby.

STRIDE Team's field survey and assessment after the passage of Ty Glenda (18.1-18.2) and Ty Ruby (18.3-18.4)

Information Education and Communication (IEC) Campaign

A continuing activity of the agency is aimed at increasing public awareness on natural hazards for proper implementation of appropriate mitigation measures. The main component of the IEC program is the consistent participation of its personnel as resource persons in seminars, workshops, training, fora, and other public gathering organized by LGUs, NGOs and other disaster-oriented organizations on related topics such as hydro-meteorological hazards, climate change, El Niño, La Niña, the agency's role in S&T and disaster preparedness and mitigation. A total of 21,318 participants attended the different fora conducted in Metro Manila and in some provinces. These activities have helped bring PAGASA closer to the public and likewise enhanced the participants' level of awareness on disaster reduction. Likewise, a total of 41,979 information materials such as pamphlets, maps, posters and brochures were distributed to the public to help sustain the agency's IEC campaign. Strengthening of ties with the media continues in support for a wider dissemination of information.

Research and Development

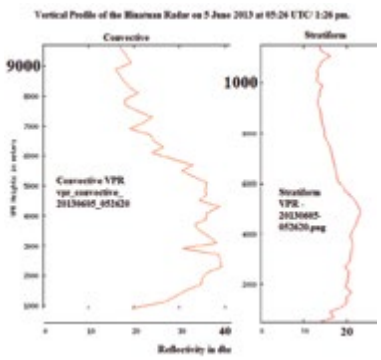
On research and development activities, PAGASA stepped up efforts to develop systems and techniques to improve its operational forecasting and warning capabilities. These activities are supportive of the R&D priorities of the Department of Science and Technology (DOST), which primarily aim to enhance agricultural and industrial productivity, water resources and energy production. The following are the completed and on-going research and projects being implemented and monitored by the agency:

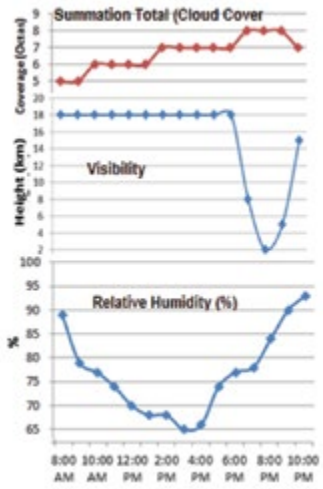
Completed R&D

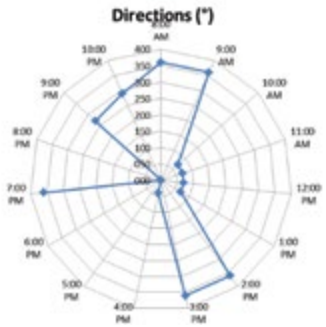
Intercomparison and Validation of Radar rainfall Estimates Using Raingauge Data for Hinatuan and Cebu Radars (2012-2014)

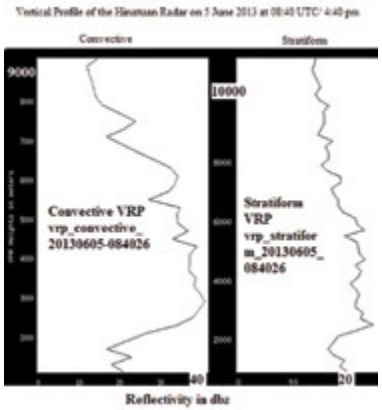
A. Davao City Flooding on 5 June 2013

The flood event occurred on 5 June 2013 in Davao City at 9:00 PM was studied. Some pre characteristics of the atmosphere based on the following: Climatology, Infra-Red Satellite 1, surface observation, Hydrometeorology Decision Support System (HDSS) of Hinatuan radar was examined at least three hours backward this severe weather event. The result shows that the following current and maintained synoptic situation like: Davao City with the highest normal rainfall for the month of June, Intertropical Convergence Zone (ITCZ), Low Pressure Area (LPA) over Mindanao, infrared satellite photo with red down to gray colors of cloud formation as manifested by Cumulus Nimbus (Cb) clouds at 2:00 PM onwards, Davao City already cloudy since 8:00 AM early backing winds, and dew point temperature greater than 25°C, Hydro-meteorology Decision Support System (HDSS) with reflectivity of clouds over the areas starting from 5:00 PM onwards moving northwest toward to Davao City up to 9:00 PM. The results showed that the mechanisms of the synoptic features in relation to this weather situation lead to the heavy rainfall associated with severe thunderstorm and lightning that happened in the area. It is recommended that surface observations be in EXCEL format data entry as received at near real time for immediate comparative analyses of the existing weather.



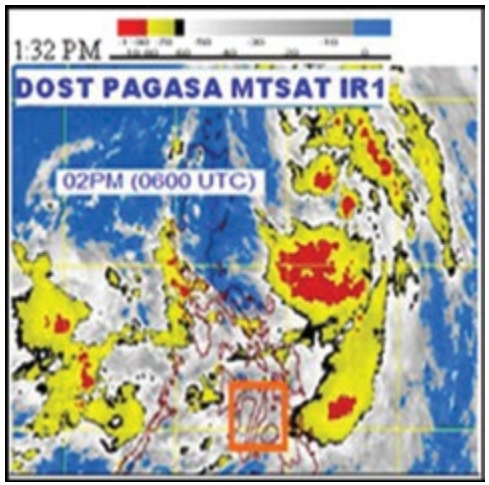




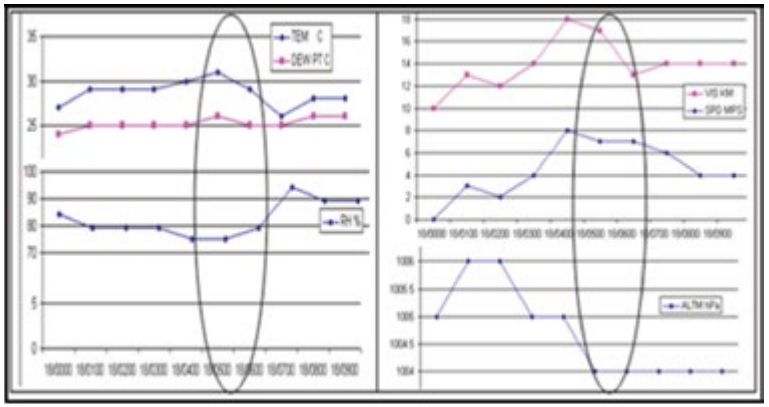


B. The Tornado Occurrence in Minglanilla, Cebu on 18 June 2013

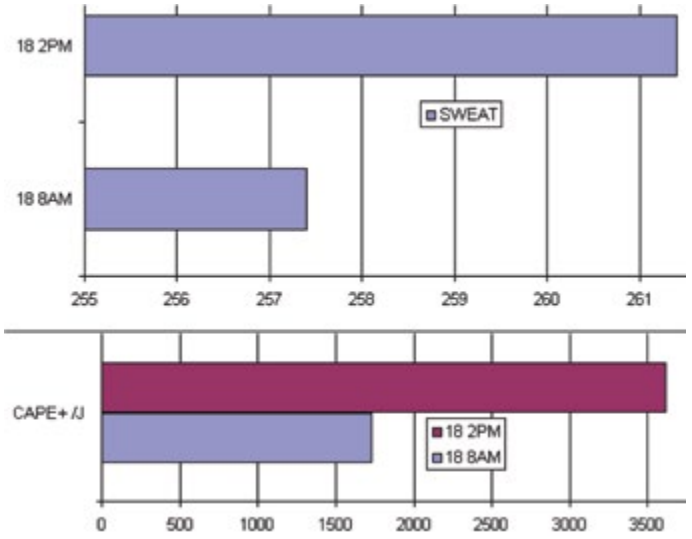
The tornado event that occurred on 18 June 2013 in Cebu was studied. The following observations like climatology, existing weather, infrared satellite, Meteorological Aviation Report (METAR), Upper Air, Hinatuan radar as visualized from Hydrometeorology

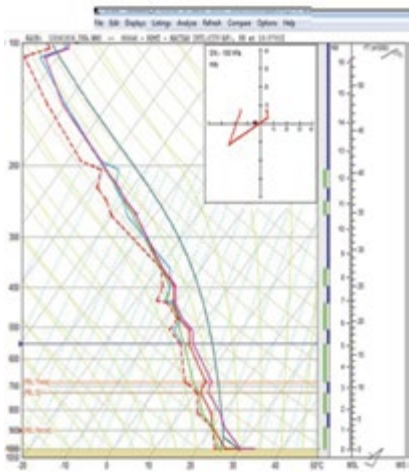


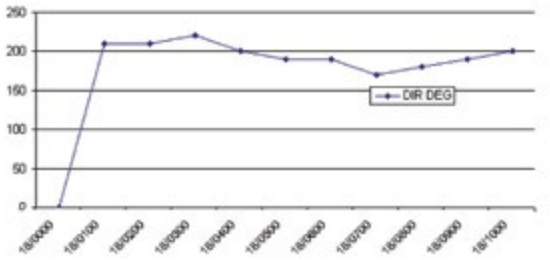
Decision Support System (HDSS) were examined. The results showed the following: that Cebu is a tornado prone area that can be seen in the Philippine tornado hazard map, the presence of Tropical Storm (TS) Emong in the north eastern part of the Philippines brought bad weather as depicted in satellite at 2:00 PM, the hourly observations had positive indication of severe weather especially the 5 hours before the sustained synoptic condition and the monitored photos of Hinatuan radar at 10 minutes intervals wherein the hook shaped tornado was detected. Within the short time of six hours before this event, if

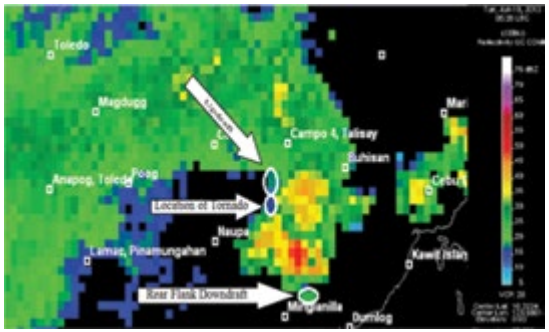


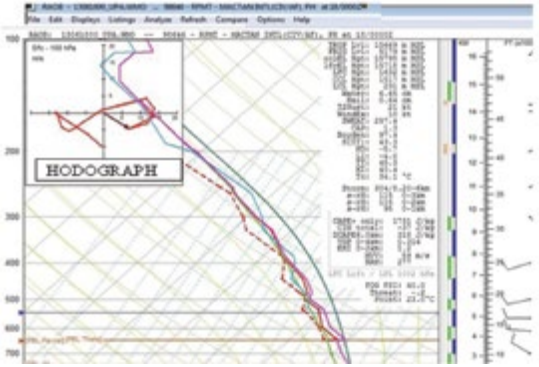
all the present state of the art tools were monitored then there is a strong possibility to warn the public leading to disaster preparedness. Therefore, precautionary measures to manage the risks and proper evacuation can be implemented. It is recommended to use the above listed criteria to forecast the same event.











An Algorithm to Enhance Nowcast of Rainfall Brought by Tropical Cyclones Through Separation of Motions. by W.C. Woo, K.K. Li, Michael Bala

Abstract

The Hongkong Observatory operates an in-house developed nowcasting system, namely "Short-range Warning of Intense Rainstorms in Localized Systems (SWIRLS)", to support the operation of rainstorm and severe weather warnings as well as to provide rainfall nowcast services for the public and for special users in Hong Kong. Aiming to enhancing its performance in nowcast of rainfall brought by tropical cyclones, a new radar echo tracking scheme that separates the motion of the spiraling rain bands from the overall movement of tropical cyclone has been developed. Back-testing with historical cases in the past ten years reveals that the new scheme is more capable of preserving tropical cyclone rain band structures and can enhance forecast skills.

On-going projects/researchers

Foreign-Funded

- Improvement of Flood Forecasting and Warning System for Magat Dam and Downstream Communities - Norwegian funding
- Strengthening of Flood Forecasting and Warning System (FFWS) in the Bicol River Basin - (JICS)
- Applying Remote Sensing Technology in River Basin Management - JAXA-ADB
- Enhancing the Forecasting and Warning Capabilities of PAGASA through Effective Utilization of Weather Data – JICA -TCP.
- FAO - AMICAF Project on "Assessment of Climate Change Impacts and Mapping of Vulnerability to Food Insecurity under Climate Change to Strengthen Household Food Security with Livelihoods Adaptation Approaches"
- Enhancing Greater Metro Manila Institutional Capacities for Effective / Climate Risk Management Towards Sustainable Development (CSCAND for

GMMA Project) and Enhancing Risk Analysis Capacities for Flood, Tropical Cyclone, Severe Wind and Earthquake for GMMA (Risk Analysis Project)/ Security with Livelihoods Adaptation Approaches"

Locally-funded

- Establishment of Doppler Weather Radar Network for Disaster Prevention and Preparedness
- Climate Impact modeling on various sectors (e.g. water, agriculture, health)
- CCAM-Simulation of HadCM3 model of A1b emission scenario - Summarized by municipalities – Projected change in monthly average rainfall and temperature under medium- range Emission scenario (A1b)
- Develop an ensemble of climate change scenario in the Philippines
- Summarized and analyzed Drought events by provinces using SPI for the period 1951-2010. Severe Wind Impact Analysis and the Exposure Database for Greater Metro Manila Area (GMMA)
- Analysis and presentation of results on the Risk Analysis Project (RAP) Flood, Severe, Wind and Earthquake Impacts
- Development of Drought Monitoring index for the Philippines using Standard Precipitation Index (SPI) as a Drought Monitoring Tool
- Enhancement of Rainfall Warning System for Metro Manila.
- Isohyetal Analysis of Tropical Cyclone Rainfall during its Occurrence within the Philippine Area of Responsibility (PAR).
- A study of Thunderstorm Forecasting at Selected Areas in the Philippines
- Validation of Radar Rainfall Estimates of Subic Radar in the Pampanga- Agno River Basin
- Intercomparison and validation of Radar Rainfall Estimates Using Raingauge data for Hinatuan and Cebu Radar (2012-2013)
- Enhancing PAGASA's Impact and Risk Assessment Capability for Severe Wind Associated with Tropical Cyclone, (Legaspi, Albay)

Long-term trends and extremes in observed daily precipitation and near surface air temperature in the Phils. For the period 1951-2010

Atmospheric Research 145–146 (2014) 12–26

Contents lists available at ScienceDirect

Atmospheric Research

journal homepage: www.elsevier.com/locate/atmos

Long-term trends and extremes in observed daily precipitation and near surface air temperature in the Philippines for the period 1951–2010

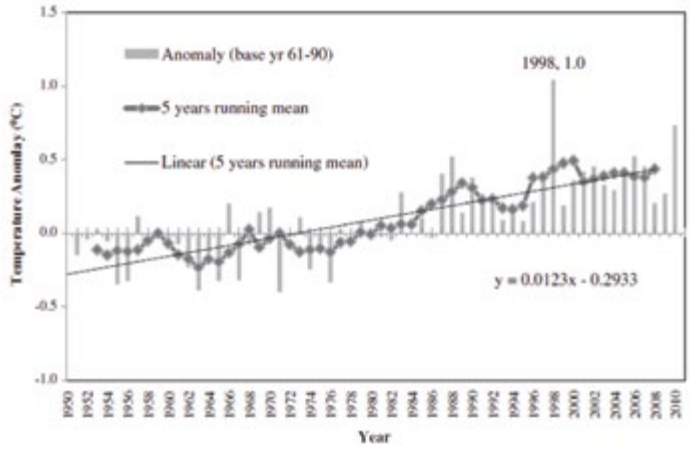
Thelma A. Cinco [a], Rosalina G. de Guzman [a], Flaviana D. Hilario [a], David M. Wilson [b,c,d,*]

[a] Philippine Atmospheric, Geophysical & Astronomical Services Administration (PAGASA), Quezon City, Manila, Philippines
[b] University of the Philippines, Los Baños, Laguna, Philippines
[c] International Centre for Research in Agroforestry, Los Baños, Laguna, Philippines
[d] Oscar M. Lopez Center for Climate Change Adaptation and Disaster Risk Management Foundation, Philippines

Observed daily precipitation and near surface air temperature data from 34 synoptic weather stations in the Philippines for the period 1951–2010 were subjected to trend analysis which revealed an overall warming tendency compared to the normal mean values for the period 1961–1990. This warming trend can be observed in the annual mean temperatures, daily minimum mean temperatures and to a lesser extent, daily maximum mean temperatures.

Precipitation and temperature extremes for the period 1951–2010 were also analysed relative to the mean 1961–1990 baseline values. Some stations (Cotabato, Iloilo, Laoag and Tacloban,) show increases in both frequency and intensity of extreme daily rainfall events which are significant at the 95% level with none of the stations showing decreasing trends. The frequency of daily temperature maximum above the 99th percentile (hot days) and nights at the 1st percentile (cold nights) suggests that both days and nights in particular are becoming warmer.

Such indicators of a warming trend and increase in extreme events in the Philippines are discussed in the context of similar national, regional (Asia Pacific) and global studies. The relevance of such empirically based climatology studies, particularly for nations such as the Philippines which are increasingly vulnerable to the multiple impacts of global climate change, is also considered.



Observed annual mean temperature anomalies in the Philippines during the period 1951–2010 compared with the 1961–1990 normal values.

Changes in extreme rainfall in the Philippines (1911–2010) linked to global mean temperature and ENSO

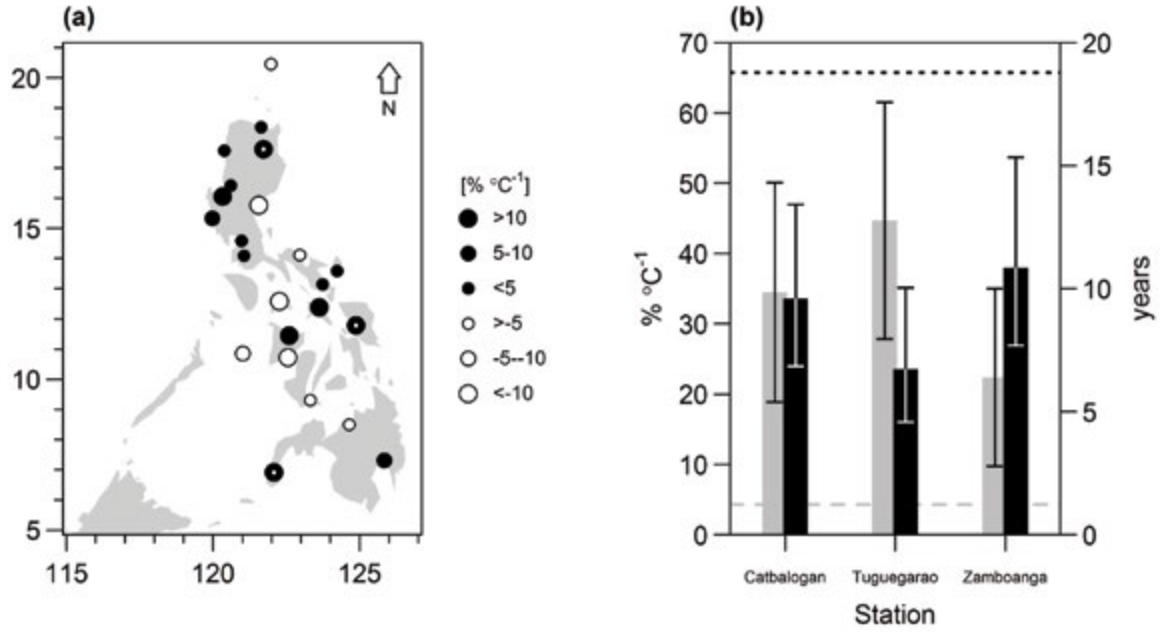
Marcelino Q. Villafuerte IIa,b*, Jun Matsumotoa,c and Hisayuki Kubotac
a Department of Geography, Graduate School of Urban Environmental Sciences, Tokyo Metropolitan University, Tokyo, Japan
b Philippine Atmospheric, Geophysical and Astronomical Services Administration, Quezon City, Philippines
c Japan Agency for Marine-Earth Science and Technology, Yokosuka, Japan

ABSTRACT

Statistical modelling of extreme valueswas used to detect potential changes in extreme rainfall in the Philippines and to investigate whether such changes are associated with the rising near-surface global mean temperature and the El Niño–Southern Oscillation (ENSO). The generalized extreme value distribution was formulated to its stationary and non-stationary forms, and then was fitted by the maximum likelihood method to the series of daily rainfall annual maxima (RX1day) spanning 100 years (1911–2010) at 23 meteorological stations across the country.

Subsequently, statistically significant changes in extreme rainfall in the country were detected; such changes were further linked to the near-surface global mean temperature and ENSO. Specifically, the study has revealed a country-averaged increase in the median intensity of extreme rainfall by about 4.3% °C–1 rise in the near-surface global mean temperature. Furthermore, a seasonal influence of ENSO on extreme rainfall in the Philippines has been shown. In particular, the stations located in the northwest section of the country, where 75–100% of the RX1day occurred in the summer monsoon season (July–September) during the entire period of 1911–2010, showed an average increase in the median intensity of extreme rainfall by about 6.5% °C–1 increase in the ENSO index.

These findings imply a potential intensification and increase in the occurrence of extreme rainfall into the future as the global mean temperature continues to rise, and such trends should be considered in adaptation strategies to minimize the disasters caused by extreme rainfall events in the Philippines.



Sensitivity of the location parameter of the GEV per degree Celsius change in global mean temperature anomaly (GTA) at: (a) every station and (b) the stations where it is significant at 5% level based on the likelihood ratio test (grey bars, left axis). The corresponding return periods of RL20 when the GTA is warmer by 1 °C are shown as black bars in (b), and the error bars are based on the observed information matrix of the maximum likelihood estimates. The horizontal dashed (dotted) line marks the country-averaged change in median intensity of extreme rainfall (20-year return period) per degree Celsius change in GTA (when the GTA was warmer by 1 °C). (Figure 5 in Villafuerte et al., 2014).

A Regional Climate Modelling Experiment for Southeast Asia Using PRECIS Regional Climate Model and selected CMIP3 Global Climate Models

This technical report is a product of the Southeast Asia Climate Analyses & Modeling (SEACAM) Framework which was initiated by the Centre for Climate Research Singapore of the Meteorological Service Singapore (CCRS-MSS) and in collaboration with the Met Office Hadley Centre (MOHC). It assessed the performance of the PRECIS Regional Climate historical simulations and analysed future changes for S.E. Asia up to year 2100. The report was contributed by climate researchers from the region's National Meteorological & Hydrological Services (NMHSs) and Research Institutes (RIs), as well as scientists from the MOHC.

SEACAM's regional climate modelling experiment provides high-resolution (25 km) information on future climate change projections for the S.E. Asia region up to year 2100. This was done by dynamical downscaling of 5 selected members of the Met Office HadCM3Q ensemble and the ECHAM5 model (from the Max Planck Institute for Meteorology) using the Met Office PRECIS model. The selection of members from the HadCM3Q ensemble was done by assessing their ability to simulate the major features of S.E. Asian climate and capturing the broadest range of future projections for temperature, monsoon characteristics and precipitation

Model simulations were evaluated against appropriate observation datasets available, which includes APHRODITE and CRU. In instances where direct observations were not accessible, the ERA-40 reanalysis was used to compare against the simulations. The ERA-40 reanalysis was also used to drive the PRECIS model and the downscaled reanalysis outputs were also compared against the model simulations to assess the performance of the regional climate model on its own, without (or with minimal) errors coming from the driving global climate model data

Model projections are made for the mid-century (also "mid-term") for the 30-year period between 2031 and 2060 and also for the end-century (also "long-term") for the 30-year period between 2071 and 2100. For all projections, the changes are reported relative to the baseline period of 1971-2000.

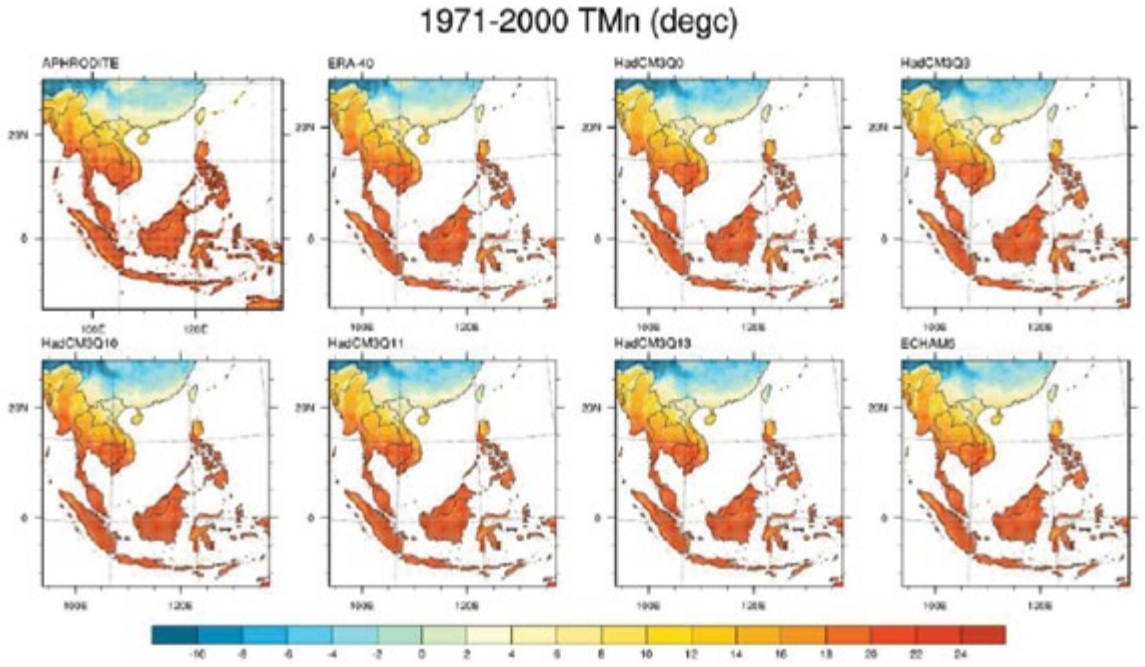


Figure 5.41: Mean annual minimum average daily temperature, TMn, from APHRODITE, the ERA-40 simulations, the HadCM3Q0, 3, 10, 11, 13 and ECHAM5 simulations.

Significant influences of global mean temperature and ENSO on extreme rainfall in Southeast Asia[1]

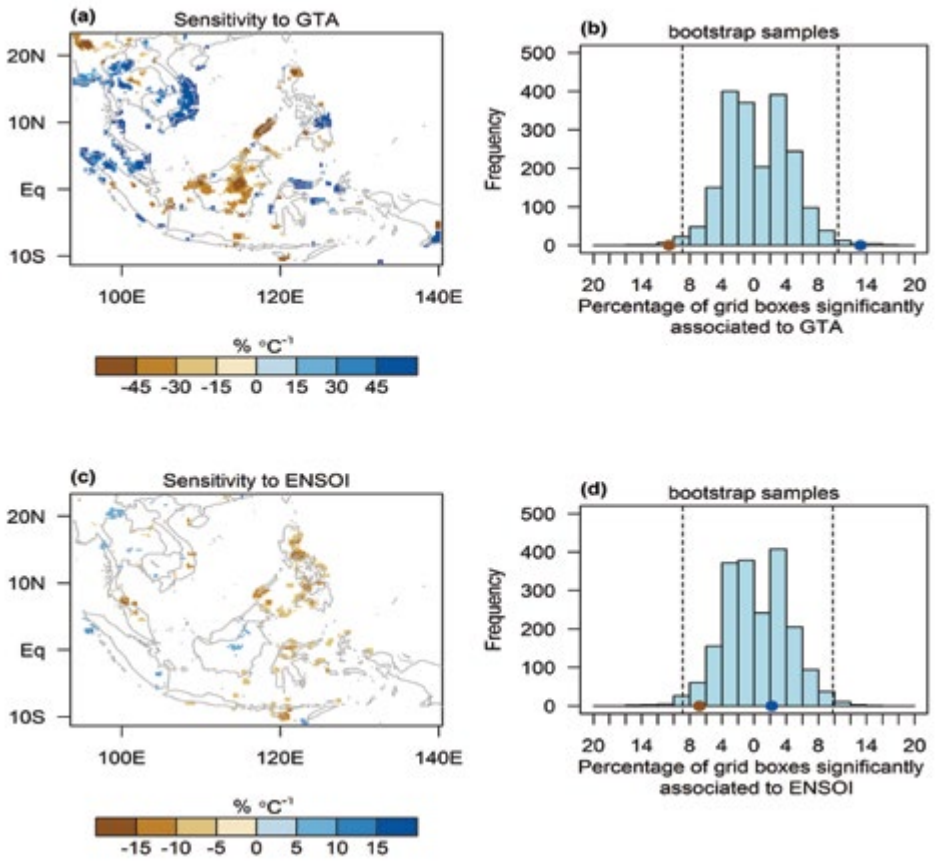
Marcelino Q. Villafuerte II[1,2] and Jun Matsumoto[1]

[1]Department of Geography, Tokyo Metropolitan University, Tokyo, Japan
[2]Philippine Atmospheric, Geophysical and Astronomical Services Administration, Department of Science and Technology, Quezon City, Philippines

ABSTRACT

This study investigates the changes in annual and seasonal maximum daily rainfall (RX1day) in Southeast Asia, obtained from gauge-based gridded precipitation data, to address the increasing concerns about climate change in the region. First, the nonparametric Mann–Kendall test was employed to detect significant trends in RX1day. Then, maximum likelihood modeling, which allows the incorporation of covariates in the location parameter of the generalized extreme value (GEV) distribution, was conducted to determine whether the rising global mean temperature, as well as the El Niño–Southern Oscillation (ENSO), are influencing extreme rainfall over the region. The findings revealed that annual and seasonal RX1day is significantly increasing in the Indochina Peninsula and east-central Philippines while decreasing in most parts of the Maritime Continent during the past 57 years (1951–2007). The trends in RX1day were further linked to the rising global mean temperature. It was shown that the location parameter of the GEV, and hence the RX1day on average, has significantly co-varied with the annually averaged near-surface global mean temperature anomaly. Such co-variation is pronouncedly observed over the regions where significant trends in RX1day were detected. Furthermore, the results demonstrated that as ENSO develops in July–September, negative co-variations between the location parameter of the GEV and the ENSO index, implying more (less) likelihood of extreme rainfall during La Niña (El Niño), were observed over the Maritime Continent. Such conditions progress northward to the regions of Indochina Peninsula and the Philippines as the ENSO approaches its maturity in October–December, and then retreat southward as the ENSO weakens in the ensuing seasons.

Sensitivity of annual RX1day, on average (i.e., the location parameter of the GEV) per degree Celsius change in (a) global mean temperature anomaly (GTA) and (c) El Niño–Southern Oscillation index (ENSOI; only those that are significant at 5% level based on the likelihood ratio test are shown). The percentage of grid boxes where significant negative association (left side of zero in the abscissa) and positive association (right side of zero in the abscissa) with (b) GTA and (d) ENSOI are also shown. The histograms in (b) and (d) are based on the 1000 bootstrap samples of annual RX1day in Southeast Asia, while the brown and the blue dots are based on the original data. The area of the histogram within the two dashed-lines in (b) and (d) corresponds to the 95% of the distribution that occurred by random chance. (This figure will appear as the Fig. 4 in the original article).



Downscaled Projected Changes (2011-2040) in Seasonal Mean Temperature and Rainfall in Cagayan Valley, Philippines

Joseph BASCONCILLO, Anthony LUCERO, Analiza SOLIS
Philippine Atmospheric Geophysical and Astronomical Services Administration,
Climatology and Agrometeorology Division, Quezon City, Philippines

Robert SANDOVAL Jr., Eulito BAUTISTA
Food and Agriculture Organization of the United Nations, AMICAF-Philippines, Quezon City, Philippines

Tatsuji KOIZUMI, and Hideki KANAMARU
Food and Agriculture Organization of the United Nations, Rome, Italy

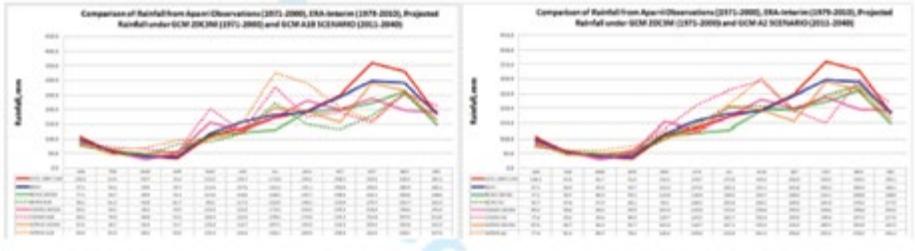
Journal of the Meteorological Society of Japan
J-STAGE Powered by SCHOLARONE MANUSCRIPTS™

Abstract

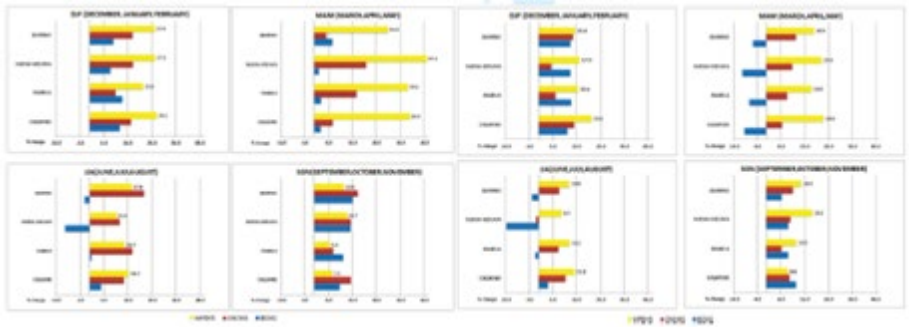
Results obtained from the downscaling showed that there will be significant climate changes from 2011-2040 in terms of rainfall and temperatures. Robust signals of climate change were found in many seasons and variables, while conflicting signs of changes were found in a few cases. Inter-model difference is found to be as large as inter-scenario difference in this time horizon. A larger warming is projected for daily minimum temperature than maximum temperature, thus reducing diurnal temperature range. Precipitation is projected to increase in general in the Valley. Regarding seasonality, dry months will continue to remain dry but July is likely to become a more notable wet month in addition to November within the rainy season. There are also indications of increasing frequency of extreme heavy rainfall events (about two-fold), number of dry spells (especially in Aparri), and extremely hot days.

Rice is an important commodity in the Philippines. In the Cagayan Valley (CV) region, rice production provides employment to more than half of the region's population, and climate variability and change can cause negative impacts on crop production and livelihoods. This paper attempts to understand projected climate changes in seasonal rainfall and mean temperature (2011-2040) in order to inform climate change adaptation planning in Cagayan Valley. The climate change projections were provided to crop and water resources modeling, agricultural market modeling, food insecurity vulnerability analysis, community-based climate change adaptation planning, and policy simulation.

The results are presented for the Provinces of Cagayan, Isabela, Nueva Vizcaya, and Quirino based on the statistical downscaling of three global climate models (BCM2, CNCM3, and MPEH5) and two emission scenarios (A1B and A2). A spatial interpolation technique was utilized in interpolating downscaled climate projections at weather stations to grids, and they were aggregated to administrative provinces.



Projected Changes in Seasonal Mean Rainfall (A1B, A2)



Projected Seasonal Change in Minimum Temperature (A1B, A2)

Infrastructure Development

Fairly large sum out of the agency budget went into construction, repair and rehabilitation of buildings, facilities and other installations. The following summarizes the various infrastructure project implemented during the year.

- Rehabilitation of Guiuan Doppler Radar
- Field Calibration of 17 AWS and 75 ARG
- Support Services for PAGASA ICT System
- Provided repair/maintenance services of PAGASA internet/LAN connection including repair & maintenance of computers from various offices of the Agency
- Deployment of technical personnel to man ICT facilities at Forecasting during inclement weather ensuring continuous ICT operations.
- Rehabilitation/improvement of PAGASA Station building & facilities @ Tayabas PAGASA Station
- Establishment of new Bohol Synoptic Station
- Rehabilitation/improvement of PAGASA Radar Tower building including electrical installation of main feeder line & Station building electrical system @ Basco Radar Station
- Rehabilitation of Tagaytay PAGASA Doppler Radar building, repainting of steel tower & radome panels –Repair of Public CR, pump house & construction of lifeguard station; and renovation of picnic hut @ Science Garden
- Construction of 3m x 700m @ 6' thick access road @ Tampakan, South Cotabato
- LBP Quezon City Branch Offsite ATM @ PAGASA Science Garden
- Rehabilitation /improvement of Media Room @ WFFC Building
- Repair/rehabilitation of typhoon damage station building @ Rehabilitation of CAPSU-PAGASA Agromet Station

Newly constructed Dauis PAGASA Station

Human Resource Development (HRD)

The level and quality of education and training of personnel are a constant concern of the PAGASA. The efficient and effective delivery of the agency services depends to a large extent on these factors. Thus, as ever, training of personnel through different avenues and means is continuously a major component of the PAGASA programs.

For the semester, a good number of PAGASA personnel underwent secondment trainings through in-house trainings programs held here and abroad. The agency took advantage for the attainment of technical and administrative proficiencies of many of its personnel, a total of 85 personnel of which 25 participated locally while 60 personnel availed of the training/workshop/conference/symposium/seminar abroad.

Interactions and exchange of technical knowledge whether during discussions in sessions during conferences and seminars, or in informal corridor and coffee table conferences, have always been meaningful conduits in the learning process. Many opportunities for interactions with local and foreign scientist were opened for a number of agency personnel. These opportunities were realized through linkages with local and international organizations.

In the fulfillment of its commitments to national and international cooperative programs, in line with high-level manpower development, PAGASA awarded scholarship grants to 12 Filipinos and 3 foreign students for post graduate studies in the Institute of Environmental Science and Meteorology (IESM) at University of the Philippines and in other universities accredited by the DOST. The scholars were supported under the PAGASA Scholarship Program, the DOST- HRD Program, and the World Meteorological Organizations (WMO) Voluntary Cooperation Program (VCP). Also during the year, three (3) PAGASA personnel supported by the Philippine-Australia Human Resource Organizational Development Facility (PAHRODF) to pursue postgraduate studies in Australia.

Under the Science Internship Program of the agency, a total of seventy nine (79) students from different schools were accommodated for the on-the -job training on various fields of operation of PAGASA.

The following were in-house training conducted by the Agency during the year:

Title	Objectives
Hydrologist Training Course (HTC)	Participants shall acquire broad knowledge and skills in hydrology
Capacity Enhancement for Doppler Radar Application in Nowcasting	Enhance the capacity of Forecasters , Hydrologists and Researchers in weather forecasting and warning using Doppler Radar
Probabilistic, Quantitative, Precipitation Forecasting (PQPF)	Acquire knowledge in Quantitative Precipitation Forecasting
Refresher Course on Meteorological Observations, Practices and Procedures for Field Station Personnel	To refresh and broaden the participants' knowledge and skills particularly in the observation, encoding/decoding, transmission and plotting of the different weather elements and secondarily to grasp the full functions of meteorological instruments, equipment and other related facilities including their comprehensive maintenance.
Government Radio Operator's Certification (GROC) for Field Station Personnel (Regional)	To be able obtain license to operate radio equipment legally.
Meteorological Technicians Course (MTTC)	To be able to qualified meteorological technicians having completed the basic instruction package for meteorological technicians (BIP-MIT) . Also be able to conduct preventive maintenance on meteorological equipment.

Local and International training, seminar/workshop

Local

Forecasting Training on Doppler Radar conducted at PAGASA Central Office

Lecture of Dr. Gareth Davies, Hydrology Expert, Hydrologist Training Course (HTC), PAGASA-WMO Regional Training Center

Orientation Seminar for New Employees, PAGASA Amihan Conference Room

Phase II: Training on Probabilistic, Quantitative Precipitation Forecasting, PAGASA-WMO Regional Training Center

JOOMLA Training on the Migration of the PAGASA/PRSD Websites to the Government Hosting Services plus Social Media, PAGASA-WMO Regional Training Center

Refresher Course on Meteorological Observations, Practices and Procedures for Southern Luzon-PRSD, Rendezvous Beach Hotel and Resort, Masbate City

Refresher Course on Meteorological Observations, Practices and Procedures for Northern Luzon-PRSD, Northview Hotel, Laoag City

Supervisory Development Course, PAGASA Amihan Conference Room

Disaster Risk Reduction Management Seminar,
PAGASA Amihan Conference Room

Values Orientation Workshop and Re-Orientation Seminar,
Water Front Insular Hotel, Davao City

AMICAF-Philippines Step I & II Consolidation Workshop, Holiday Inn, Clark, Pampanga, 14-16 July 2014

International

The Philippines, through PAGASA, remains the WMO's as the Regional Meteorological Training Center for the South West Pacific. For 2014, PAGASA conducted Regional Training Workshop on Severe weather forecasting demonstration projects (SWFDP)- Regional Subproject for Southeast Asia Training Workshop on Severe Weather Forecasting and Warning Services (PAGASA and WMO) Project for thirty nine (39) WMO nationals, from Japan; Pakistan; Cambodia; Laos; Thailand; Canada; Vietnam; Hongkong China; Geneva, Switzerland; and the Philippines.

Regional Training Workshop on Severe Weather Forecasting and Warning Services, Severe Weather Forecasting Demonstration Project (SWFDP), Regional Sub-Project for Southeast Asia (SWFDP SeA), PAGASA-WMO Regional Training Center

eSurge Training Course in Applying Earth Observation Data to Storm Surge Modeling and Forecasting, Cork Ireland, 20-21 February 2014, Mr. Edino Nonato L. Nolasco, Weather Specialist II, (front, 4th from right)

Mr. Edino Nonato L. Nolasco, Weather Facilities Specialist II, participated in the "eSurge training course in "Applying Earth Observation Data to Storm Surge Modeling and Forecasting" held at Cork, Ireland on February 20 -21, 2014.

The two-day course demonstrated and teaches modelers and forecasters how the application of Earth Observation (EO) data can enhance their efforts to model and forecast storm surges.

The training ensured all modelers and forecasters comprehend all the key concepts on forecasting and modeling and focused on inputting & researching ways and means to exploit the full range of EO data available, and identify how to proceed.

Participants were taught about the potential for applying Earth observation data to Storm Surge Modeling and Forecasting, and had the chance to meet folks from around the globe focused on mitigating the impacts of storm surges and coastal inundation.

Mr. Bernard R. Punzalan II, Weather Observer I, CARDS-RDTD participated, Advanced International Workshop on Climate Change and Agricultureon 9 June – 19 June 2014 in MASHAV-CINADCO Training Center, Kibbutz Shefayim, Israel. The workshop demonstrates advanced Methodologies and Techniques developed in order to compensate for the impact of unfavorable climate conditions on agricultural production. Workshop Objectives are to discuss the effects of climate change on different fields of agriculture and agricultural production and demonstrate modern Agro-meteorological Techniques and methods for mitigating the effects of climate change. The workshop was organizers /sponsors by World Meteorological Organization – Regional Training Center (WMO-RTC) Israel, Israel Meteorological Service (IMS), Center for International Agricultural Development Cooperation of the Israeli Ministry of Agriculture and Rural Development (CINADCO-MARD) and MASHAV (Israel's Agency for International Development and Cooperation under the Ministry of Foreign Affairs)

Advanced International Workshop on Climate Change and Agriculture, Kibbutz Shefayim, Israel, 9-19 June 2014. Mr. Bernard R. Punzalan II, Weather Observer I, (2nd row, rightmost)

Japan Meteorological Agency (JMA) Workshop on WIS Implementation, Tokyo, Japan, 18-20 November 2014
Ms. Nancy Lance, Asst. Weather Services Chief and Engr. Arnel R. Manoos, Weather Facilities Specialist III and, (1st row, 2nd and 3rd from left, respectively)

Japan Meteorological Agency/World Meteorological Organization (JMA/WMO) Workshop on WMO Information System (WIS) Implementation held at Japan Meteorological Agency, 1-4-3 Otemachi, Chiyoda-ku, Tokyo Japan 100-8122 on November 18 - 20, 2014, participated by Ms. Nancy T. Lance, Asst. Weather Services Chief and Engr. Arnel R. Manoos, Weather Facilities SpecialistIII.

The seminar workshop aimed to impart the capacity requirements necessary for operating WMO Information System (WIS) centers and basic concepts of training framework for developing and maintaining capacity.

Discussion on the milestone was provided by Mr. Yoshitomo KOJOH, Senior Coordinator for International Communications, JMA who presented the following for discussion:

- WMO Information System development milestone
- Tokyo Global Information Service Center (GISC) and the Area Meteorological Data Communication Network (AMDCN) enhancement plan.
- Establishment of WIS backup facility for PAGASA (business Continuity Plan)
- Regular conduct of monitoring of WIS data exchange between National Centers and Tokyo GISC

UM User Workshop 2014

The 2014 UM User Workshop took place at the Met Office in Exeter from the 16th to the 20th June 2014. The five day event focussed on Model Evaluation, Technical Infrastructure Development, Atmospheric Composition and Convective Scale Modeling. Participated by Ms. Shirly David and Mr. Resly Amdor.

2014 UM User Workshop, Meteorological Office, Exeter, United Kingdom, 16-20 June 2014
Ms. Shirly J. David, Sr. Weather Specialist (front, 3rd from right) and Mr. Resly George Q. Amador, Weather Observer 1, (front, rightmost)

2014 Asia-Pacific Weather Radar Network Workshop

APEC Research Center for Typhoon and Society (ACTS) hosted “2014 Asia-Pacific Weather Radar Network Workshop” in Taipei and a study field trip to Wu-Fen-Shan Weather Radar Station and Central Weather Bureau on 18-19 February. Participated by Mr. Dionisio C. Sarmiento, Jr. and Mr. Resly George Q. Amador.

2014 Asia Pacific Weather Radar Network Workshop, Taipei, Taiwan, 18-19 February 2014, Mr. Dionisio C. Sarmiento, Jr., Weather Specialist II and Mr. Resly George Q. Amador, Weather Observer 1 (2nd row, 3rd and 6th from right, respectively)

International Training Course on Thunderstorms and Severe Convection Nowcasting, Beijing, China, 13-23 May 2014, Ms. Netherlen C. Saletrero (4th row, 2nd from left).

Training Workshop on 6th International Climate Variability and Prediction, Turkey, 2-17 August 2014, Mr. Anthony Joseph R. Lucero (front row, rightmost)

Training of Trainers for Climate Field School in Asia-Pacific, Indonesia, 26-29 August 2014, Ms. Ruthie M. Pacala (front row, rightmost) and Ms. Susan C. Flores (2nd row, 2nd from right)

Training Workshop on Climate Impact Assessment on Watershed Hydrology, Pakistan, 15-17 September 2014, Mr. Joseph Q. Basconcillo (front row, 2nd from right)

1st World Climate Research Programme (WCRP) Coordinated Regional Downscaling Experiments (CORDEX) Science Workshop, Indonesia, 17-20 November 2014, Ms. Ana Liza S. Solis (4th row, 2nd from left) and Mr. Joseph Q. Basconcillo (2nd row, 3rd from left)

ASEAN Climate Outlook Forum (ASEANCOF), Singapore, 17-19 November 2014, Mr. Anthony Joseph R. Lucero (2nd row, 5th from left) and Ms. Cherry Jane L. Cada (front row, leftmost)

Scholarships

Dr. Marcelino Q. Villafuerte II, Doctor of Philosophy in Science, Tokyo Metropolitan University (October 2011 - October 2014)

Ms. Vivien E. Esquivel, Master in Climate Change, Australian National University (January-December 2014)

Mr. Jose Daniel C. Suarez, Master in Public Administration, University of Sydney (January-December 2014)

Local and International Linkages/Collaboration

Collaboration with local and international organizations continued in terms of exchanges of information on meteorology and related fields; technology transfer; and financial grants/support for the socio-economic programs. As part of its international commitments, particularly with UN agencies and the WMO, country representation was provided in international scientific fora. The following were some of the collaborative efforts done by the institution as well as participation and invitation by WMO member countries.

Conducted Monthly Climate Outlook Forum held at Amihan Conference Room, Central office PAGASA from January to December 2014.

The Forum was attended by representatives from the various agencies of government and private sector entities. The Forum provided an avenue to increase the level of awareness of the participating agencies from public and private sectors for updates on the development of the La Niña phenomenon, review of the climate conditions during the last two months, status of major dams, and extended forecasts, among others. As always done in previous forums, participants were encouraged to actively participate in the discussions, towards a fruitful meeting of minds.

Climate Outlook Forum, PAGASA Amihan Conference Room

Conducted Annual Program Review and Analysis (PRA) and Planning Conference

The Annual PAGASA Program Review and Analysis (PRA) and Planning Conference was conducted at Amihan Conference Room at Central Office of PAGASA held on January 23-24, 2014. The PAGASA Annual PRA involved assessment of the performance of all various operating units based on the Priority Programs/Activities for the 2nd semester of FY 2013 and review of the FY 2014 Operations Plan. All heads of branches/divisions presented their highlights of accomplishments for the 2nd semester of FY 2013 and possible solutions to the identified concerns in the implementation of programs and priority programs/activities and new initiatives for FY 2014.

PAGASA Annual Program Review and Analysis (PRA) and Planning Conference, PAGASA Amihan Conference Room

Dr. Vicente B. Malano, Acting Adminstrator, Engr. Catalino L. Davis, Acting Deputy Administrator for Administrative and Engineering Services and Dr. Flaviana D. Hilario, Acting Deputy Administrator for Research and Development during the 2014 PAGASA Annual PRA and Planning Conference

Empowering LGU's with multi-hazard knowledge

When Typhoon Ondoy struck the country, it made us see things differently. It awakened us to the reality that the effects and devastation of natural disasters can happen anytime, anywhere."

This is the message delivered by Dr. Landrico Dalida, Jr., OIC, office of the Deputy Administrator for Operations and Services of PAGASA during the conduct of the Multi-Hazard and Risk Maps Information, Education and Communication (IEC) Campaign in Pasig City held at Tanghalang Pasigueno last March 14, 2014.

The IEC Campaign hopes to strengthen the contingency and preparedness plans of the community and create an effective response to disaster mitigation.

Addressing the crowd composed of the Pasig City officials, schools, barangay heads, private volunteer organizations, and local Disaster Risk Reduction and Management (DRRMO) officers, Dr. Dalida recognized the local government's concrete programs for disaster resilient communities.

During the IEC Campaign, the Collective Strengthening Community Awareness to Natural Disasters (CSCAND) agencies namely PHIVOLCS, MGB, NAMRIA, OCD and PAGASA, discussed the different geological and hydro meteorological hazards and the result of risk mapping, as well as a lecture on interpreting the risk maps.

Some of the highlights of the program are the group discussions of the different hazards and output presentations, as well as sharing of the best practices in DRRM of the different participating barangays.

The IEC Campaign in Pasig, with support from the office of Mayor Maribel Eusebio, is the eleventh (11th) leg of the Greater Metro Manila campaign focusing on the GMMA Ready and Risk Analysis Project (RAP) of the different CSCAND agencies of the government in which PAGASA served as the lead agency in the campaign.

Dr. Landico U. Dalida, Jr., OIC, Office of Deputy Administrator for Operations and Services during the conduct of Multi-Hazard and Risk Maps Information, Education and Communication (IEC) Campaign in Pasig City on 14 March 2014

Group discussion regarding the difference geological and hydro-meteorological hazards and the result of risk mapping during the IEC

Philippine-Australia Human Resources Organizational Development Facility (PAHRODF) and PAGASA Strategic Planning Conference

PAGASA asserts that meteorological, hydrological, climatological and astronomical services are essential to very human activity and to national development, in the long term. PAGASA, therefore, is determined to be a dynamic institution, responsive and proactive in facing the ever-changing requirements of the various sectors and the general public for weather, climate and flood information services.

PAGASA responds to the SOC Pillar of "Better Disaster Preparedness and Response," specifically in "Enabling national and local government agencies as they provide strategic leadership and work with local government units to implement effective disaster risk management policies and programs." It does this by providing timely information and recommendations regarding flood, storm and landslides induced by rainfall in order to safeguard the public and minimize the impact brought about by the said natural hazards

PAGASA, as a CSCAND agency, plays a lead role in providing scientific, technical and advisory services on climate-related, meteorological and hydro-meteorological events, including disaster preparedness education and early warning. It has created multi-hazard maps, installed early warning devices and intensified the information campaign and capacity building, at the community level, nationwide.

PAGASA's updated priority thrusts are still focused on the improvement of forecasting and operation services, disaster prevention and preparedness, physical resources development, and active participation and linkages in national and regional cooperative S&T, as well as in international scientific activities. In addition, it is giving greater attention to two crucial support components in achieving its mission: increasing its visibility as the official and authorized provider weather and other related services, specifically in providing forecasts and warning to the general public; and strengthening the capability of its organization and human resources to deliver its services.

PAGASA has aligned its implementation and operation strategy to the Aquino Administration's 16-Point Agenda, particularly in ensuring better understanding of the unusual meteorological phenomena, improving the forecasting and warning efficiency and ultimately reducing adverse impacts including climate change adaptation. Its efforts are geared towards assessing the physical and socio-economic characteristics of the disaster prone and coastal areas in the Philippines; determining the vulnerability of communities and households to hydro-meteorological hazards;

PAGASA-PAHRODF Strategic Planning: Formulating Strategies, SWOT Analysis, External Environments, Oasis Hotel and Resort, Clark, Angeles, Pampanga, 3-4 February 2014

identifying measures that can be adopted to cope with the short-term and long-term impacts of extreme climatic events, particularly in the most vulnerable areas; and quantifying the costs and benefits of these responses. The intent is to attain a significant change in the reduction of human and socio- economic losses by developing and improving ways of managing the effects of disaster, adopting mitigation measures, and using different approaches to minimize damages to lives and properties.

The change in strategy aims to strengthen PAGASA's role in: promoting excellence in the science of Meteorology both applied and research; and providing Disaster Management support towards minimum casualty, focused on the improvement of hydro-meteorological, climatological data collection, analyses and interpretation, upgrading of observation network, and intensified monitoring of extreme weather and climate events and climate change

PAGASA's organizational structure and operational systems have correspondingly changed, and continue to be reviewed, to effectively respond to emerging demands and challenges; notwithstanding articulated limitations/gaps in both organizational and human resources capacities and competencies.

PAGASA-PAHRODF Strategic Planning: Strategic Organization Architecture and Design with Key Officials, Heads and Core Group, Oakwood Premiere Hotel, Pasig City, 15 April 2014

PAGASA-PAHRODF Strategic Planning: Strategic Organization Architecture and Design with Key Officials, Heads and Core Group Oakwood Premiere Hotel, Pasig City, 15 April 2014. Dr. Vicente B. Malano, Acting Administrator, delivering his Opening Remarks

PAGASA's acquisition and installation of newly acquired equipment and new technologies require capacity building for concerned personnel that are involved in the operation and application of the new forecasting and warning system equipment. This is a priority that the agency must address as soon as equipment installation is done.

The demands brought in by PAGASA's direct involvement in READY II and GMMA require personnel retooling, not only in scientific and technical aspects, but also in non-technical areas like stakeholder relation, governance, human resource management. The alignment of human resource performance standards, processes and systems should likewise be done to ease up operational snags and ensure quality engagement with key stakeholders. The following were output on the Strategic Planning Conference conducted by the winning Learning Service Provider (LSP) the Ancilla.

HIGH LEVEL OBJECTIVES

1. Establish PAGASA as the most reliable, accurate and credible agency on weather, climate and flood information among 75 percent of the population
2. Deliver accurate and understandable weather related information to every JUAN
3. Establish two additional planetariums in Luzon and Visayas
4. Upgrade human resource and other support services capabilities
5. Be an ISO 9001 Quality Certified Agency

STRATEGIES

1. Improve Forecasting System
2. Develop and Implement Field Maintenance and Calibration Procedures for Basic and other Instruments
3. Advance Scientific Research and Application and Linkages
4. Enhance Human Resource and Organization Development Systems
5. Promote PAGASA brand as the preferred provider of Weather and other related services and advocate for sustainable support
6. Strengthen effective utilization of resources

PAGASA-PAHRODF Strategic Planning: Coaching of Core Learners for Cascading of Strategies with Core Group, PHINMA Training Center, Tagaytay City, 24-25 April 2014

PAGASA KICK OFF MEETING of KOICA 3 project "Automation of Flood Early Warning System for Disaster Mitigation in Greater Metro Manila

The project proposal entitled "Automation of Flood Early Warning System for Disaster Mitigation in Greater Metro Manila" or simply referred to as KOICA 3 project., a follow-up proposal to KOICA 2 project (Establishment of Early Warning and Response System for Disaster Mitigation in Metro Manila).

The implementation of the KOICA 2 was timely and was effective in mitigating the damages to flooding in the Pasig-Marikina river basins during the recent flooding in Metro Manila (August 19-20, 2013). PAGASA, as well as disaster risk reduction and management officers in cities along the Pasig-Marikina river , were able to utilize the early warning facilities in providing advisories and alerted the communities in flood prone areas to evacuate. In addition, the PAGASA came up with an integrated monitoring system in Metro Manila from various projects such as KOICA 2, Effective Flood control Operations System (EFCOS), under the Metro Manila Development Authority (MMDA) and the Resilience project under CIDA (Canadian International Development Agency).

The proposed project will enhance the existing monitoring system and flood forecast with the establishment of monitoring and warning stations in the allied rivers of Greater Metro Manila Area (GMMA) including the setting up of a Flood Management Center in PAGASA. The flood events of increasing magnitudes such as those in September 2009, September–October 2011, August 2012 and August 2013 underlined the need for an enhanced flood early warning system covering all river systems in GMMA. The increasing severity and frequency of flooding in the Metropolitan area and

Kick-Off Meeting for the KOICA 3 Project, "Automation of Flood Early Warning System for Disaster Mitigation in Greater Metro Manila", PAGASA Amihan Conference Room, 4 March 2014

its environs prompted PAGASA to submit the proposal as urgent need. The KOICA 3 project aims to provide advance warning of an imminent flood in flood prone communities in Metro Manila and adjacent areas.

The kick off meeting was held on March 04, 2014 at the Amihan Conference Room, PAGASA Central Office, Quezon City. Attended by the KOICA Deputy Representative Dong Hill, the meeting discussed the activities to be undertaken under the project these are as follows:

- To provide an early warning system to the residents living along the Pasig-Marikina River and in allied rivers.
- To provide scientific and automated method for gauging the flood in the Pasig-Marikina rivers and its tributaries as well as the allied rivers in Greater Metro Manila and environs;
- To establish real-time data monitoring system in concerned government offices and local government units (LGUs). rant
- To establish an integrated flood information control system (IFICS) for the PAGASA and the flood information system for Disaster Risk Reduction (DRR) offices;
- To enhance community response capability through the development of alarm systems as well as public information campaigns, awareness raising training and learning and;
- To conduct a feasibility study for design and implementation of the project.
- To enhance community response capability through the development of alarm systems as well as public information campaigns, awareness raising training and learning and;
- To conduct a feasibility study for design and implementation of the project.

Meeting between United States Trade and Development Agency (USTDA) Delegation and PAGASA regarding the proposed PAGASA Modernization Plan

United States Trade and Development Agency (USTDA) Meeting

Highlights of discussion of USTDA delegates and PAGASA, Acting Deputy Administrator for Engineering and Administrative Services Engr. Catalino Davis discussed the proposed PAGASA modernization plan implementation which includes the provision of equipment and technical services, the use of Feasibility study funded by USTDA in the design and finalization of the PAGASA Met-Hydro Telecommunication Network , Development of project to be incorporated or included in the Information Communication Technology Office (ICTO) Disaster Communication Plan and with the iGov Philippines project.

Proposed additional needs of PAGASA to be requested to USTDA:

- Storm surge warning system (SLOSH, NWS)
- Storm surge detection and warning
- Monitoring of tsunamis –PHIVOLCS concern

2nd Session of the Intergovernmental Board on Climate Services, Geneva, Switzerland, 10-14 November 2014 (L-R) Dr. Flaviana D. Hilario, Acting Deputy Administrator for Research and Development, Ms. Artemilita Malano, Dr. Vicente B. Malano, Acting Administrator and another foreign participant.

36th ASEAN Sub-Committee Meeting on Meteorology and Geophysics, Vientiane Capital, Lao P.D.R., 1-3 September 2014, (L-R) Dr. Edgardo Aban, member of the ASEAN Secretariat, Dr. Flaviana D. Hilario, Acting Deputy Administrator for Research and Development, Dr. Cynthia P. Celebre, Chief, Research & Development and Training Division, Ms. Ma. Elena V. Tan, Sr. Weather Specialist, Dr. Chung Kyu Park, WMO

2014 APEC Typhoon Committee Symposium, Central Weather Bureau, Chinese Taipei, 4-5 November 2014, Ms. Edna L. Juanillo, OIC, Climatology and Agrometeorology Division and Dr. Cynthia P. Celebre, Chief, Research & Development and Training Division (5th and 6th from left, respectively)

2014 Korea International Cooperation Workshop, Yangyang, South Korea, 15-18 December 2014, Ms. Ma. Elena V. Tan, (front row, 2nd from left)

16th Session of WMO RA V, Jakarta, Indonesia, 2-8 May 2014, (L-R) Dr. Cynthia P. Celebre, Chief, Research & Development and Training Division, Dr. Vicente B. Malano, Acting Administrator, Dr. Flaviana D. Hilario, Acting Deputy Administrator for Research and Development and Dr. Tanabe, National Oceanic and Atmospheric Administration (NOAA), Honolulu, USA

"21st Session of the Asia-Pacific Regional Space Agency Forum (APRSAF-21)", Tokyo, Japan, 3-4 December 2014, Dr. Cynthia P. Celebre, Chief, Research & Development and Training Division and Engr. Raul Sabularse, PCIEERD

S & T Celebration

National Astronomy Week

The annual celebration of National Astronomy Week (NAW) was held from 17-21 February 2014 participated by students, teachers and researches.

The NAW celebration was highlighted by, Star Party Contest participated by eight (8) schools with fifty four (54) High School students (Consolation Prize of P2,000.00/school to non-winners) The Star Party Contest was held at the PAGASA Observatory, UP Campus, Diliman, Quezon City on February 21, 2014. The contest was composed of Five (5) games: On-the Spot Painting, Astro Quiz Bee, Search and centered selected celestial object, Astro Henyo and Group Contest. All participating school was represented by six (6) High School Science students and one (1) Science Adviser. After registration, two (2) students from participating school were oriented/hands-on in the operation of telescope in preparation for the Search and Centered Selected Celestial Object Contest. Astro Henyo, Quiz Bee and On-the-Spot Painting were represented by two (2) and one (1) students from each school, respectively. The winners were judged based on the total highest accumulated points per game.

The overall winner was the Ramon Magsaysay High School won P20,000 , 2nd Bignay National High School, P 15, 000, 3rd Commonwealth High School P 10,000 and consolation and for the consolation prize each wins 2,000 New Era High School, Caloocan City Science High School, Gen. Pio Del Pilar High School, Peacemaker International Christian Academy and E. Rodriguez Vocational High School.

The free planetarium shows, held at the Planetarium Unit (PU), Science Garden, Quezon City was participated by 2,235 students and Astro enthusiasts, while the Stargazing and Telescoping sessions were conducted at the PAGASA Observatory, UP Diliman participated by 207 students. The Free Mobile Planetarium on Tour held at Citrus High School, San Jose Del Monte (SJDM), Bulacan (Feb.19-20, 2014) was attended by 815 students.,

DOST-PAGASA's 2014 National Women's Month Celebration

The celebration of Women's Month in March 2014with the theme: "Juana, ang Tatag Mo ay Tatag Natin sa Pagbangon at Pagsulong," paid tribute to the strong and resilient "Juanas" who have brought inspiring changes in the country and across the globe. The Philippine Commission on Women (PCW) spearheaded the celebration in coordination with other government agencies and non-government organizations. The Department of Science and Technology (DOST) conducted exciting activities geared toward the empowerment and recognition of the Filipino women in today's society. DOST-PAGASA, in particular, actively participated in agency-specific activities nationwide conducted during the month-long celebration of Women's Month 2014.

The Human Women's Symbol Formation kicked off Women's Month the celebration on March 8, 2014 where DOST-PAGASA personnel and representatives from different agencies gathered at the Quirino Grandstand to form part of the assembly of the human women's symbol. The said event was entered at the Guinness Book of World Records.

Fun Run Activity during the Women's Month Celebration, 8 March 2014

Mr. Nathaniel "Mang Tani" A. Cruz, former PAGASA employee and currently the Resident Meteorologist of GMA 7, delivering an Inspirational Message on Juana Talk Forum during the Women's Month Celebration

The DOST-PAGASA conducted a forum entitled "Juana Talk – Forum on Women's Resiliency, Strength and Contributions to Progress" Mr. Nathaniel A. Cruz, a former PAGASA employee, gave an inspirational talked about his wife, Gloria, who had awaken from coma through the power of faith in God, strength, courage, and family love.

Closing the celebration were the Fun Run, Aerobics and Zumba sessions at PAGASA to help keep Juanas fit and in shape. Fun Run activity gave away cash prizes to lucky participants who were able to finish the run. A lecture which focused on Women's Resiliency was also held where Mr. Cruz again talked on his wife's miracle story to give inspiration to the men losing hope amidst life challenges. The program also included a livelihood workshop in coordination with Nego-Skwela where the participants learned how to turn reusable trash into cash by transforming trashes into novelty items such as car and house decors as additional source of income.

Expenses related to the National Women's Month Celebration like T-shirts, food and other allowances were charged to the Gender and Development (GAD) Budget of the agency.

The celebration of the National Women's Month 2014 was a success because of the strong support and relentless efforts provided by the agencies involved to the advocacies of today's women.

Livelihood Workshop in coordination with Nego-Skwela

Parade, PAGASA World/National Meteorological Day Celebration, 22 March 2014

Thanksgiving Mass

Scientific Forum and Junior Weather Forecasters Competition

Aerobics and Fun Games

Engaging Youth in the 2014 World and National Meteorological Day

Encouraging young people to learn more about the weather and climate system and to contribute to action on climate change, the PAGASA celebrated the 2014 World and National Meteorological Day (WMND) focusing on the youth with the theme "Weather and Climate: Engaging Youth".

As member of the World Meteorological Organization (WMO), PAGASA conducted different activities for the WMND celebration held on March 2, 2014.

Nurturing the potential of the youth

To create awareness and encourage active participation from the youth, DOST-PAGASA included a Youth Scientific Forum which covered topics on basic meteorology, climate and monitoring systems. Suited with the theme, the forum brought together junior forecasters, hydrologists and climatologists of PAGASA as lecturers.

To further encourage the youth attendees to be more involved in meteorology, four scholars of the special course on BS Meteorology presented topics on their respective research and comparative studies. Other guest presenters were graduate students from the University of Santo Tomas who discussed topic the PAGASA twitter page as a social media advisory.

The forum proved to be a learning event as attested by almost 100 participants who actively joined the discussions.

Aside from the Youth Scientific Forum, the WMND celebration also included contests for high school and college students.

The Junior Weather Broadcasting Competition became a training ground for aspiring weather reporters as it showcased the communication skills of the students. Equally exciting is the Weather Observation Challenge, the first of its kind challenge ever held wherein high schools students were tasked to accomplish scientific observation of weather parameters.

Strong commitment to serve

"I would like to extend my warmest congratulations to the officials and employees of PAGASA who were recipients of loyalty award for numerous decades of committed service, as well as those who remarkably performed their duties for the past years."

Addressing the officers and employees of PAGASA, DOST Assistant Secretary Oswaldo Santos aptly described the conferment of the Gawad PAGASA and Loyalty Awards during the whole day celebration of the WMND.

Recipients of the Loyalty Award were officers and employees who actively served in the Agency for decades while the Gawad PAGASA recognizeds the exceptional service of individuals or divisions.

Press Conference: Weather & Climate: Engaging Youth

Reinforcing support and partnerships

The WNMD culmination the presentation of the annual Wind Vane 2914 Awards. This award is given to individuals and institutions who have supported the different programs, activities and projects of PAGASA in disaster risk reduction.

Joined by the executive staff of PAGASA headed by Acting Administrator Dr. Vicente Malano, the recipients of the Wind Vane Awards were treated with a night of dance and music.

Gawad PAGASA and Loyalty Awards

A partner, an advocate, a proponent, a champion, and a bearer of news.

These are the words that can best describe the recipients of the 2014 wind vane awards conferred by the PAGASA -DOST.

The Wind Vane Award is given to individuals and institution that have supported the different programs and projects of PAGASA in its disaster risk reduction activities.

After thorough deliberation from the PAGASA Screening Committee, five individuals were chosen to receive the Awards for the 2014.

As a “Partner in information Dissemination“, Chairman Francis Tolentino of Metro Manila Development Authority (MMDA) was a recipient of the Award because of his valuable support in implementing the newly-enacted R.A. 10535, PAGASA is the official timekeeper of the Philippines and is therefore mandated to disseminate the Philippine Standard Time (PhST) and in raising public awareness on the Rainfall Warning System (RWS) Projects of the Agency by installing billboards along the major thoroughfares in Metro Manila.

Commissioner Mary Anne Sering of the Climate Change Commission was recognized for her role as a “Proponent of Climate Change Adaptation”. Sering

2014 Wind Vane Awardees, (L-R Dr. Flaviana D. Hilario, Acting Deputy Administrator for R&D), Ms. Ice Martinez, Host, TV5, Mr. Nelson Lubao, Host, TV5, Representative of Mr. Julius Alfonso C. Sabularse, VP for Operations, ALDIZ Corp., Ms. Mary Anne Lucille L. Sering, Commissioner/Vice-Chairperson, Climate Change Commission, Mr. Alfonso Tomas Pagaduan Araullo, News Reporter, ABS-CBN News and Current Affairs, Gov. Jose Ma. Clemente Sarte Salceda, Albay, Representative of Atty. Francis N. Tolentino. Chairman, Metro Manila Development Authority (MMDA), Asec. Oswaldo C. Santos (DOST) and Dr. Vicente B. Malano, Acting Administrator

is a staunch supporter of different ecological projects specifically in the creation and formulation of disaster risk reduction and climate change policies.

Named as a "Champion in Climate Change Adaptation (CCA) and Disaster Risk Reduction and Management (DRRM)", Albay Governor Jose "Joey" Salceda was a perfect choice because of his role in creating systematic actions to Climate Change and organizing strategic programs for disaster preparedness and response. Recognized as well by the United Nations, Salceda's efforts and ideas in CCA and DRRM projects are widely implemented in Albay and is also adapted by other local government units and the national government.

The youngest awardee for this year, ABS-CBN's junior reporter Atom Araullo was tagged as the "Herald for Disaster Preparedness and Awareness". His responsible news reporting on extreme weather events and his courage in conveying weather-related information to the public made an impression to the public specifically during the onslaught of Typhoon Yolanda in Tacloban Leyte last November 2013.

Araullo was also a suitable awardee because this year's theme for the celebration of the World and National Meteorological Day is "Weather and Climate: Engaging Youth". The theme is a call for the youth to be more active in addressing weather and climate concerns.

Maximizing the use of information, the fifth Wind Vane awardee is a private individual who heads a company that distributes agricultural products. Julius Alfonso Sabularse, Vice-President for Operations of ALDIZ Incorporated, is recognized as an "Advocate of Weather and Climate Information". He uses climate data and weather forecast for agricultural and environmental care.

PAGASA believes that every individual can contribute in addressing the need for more action and response on disaster risk reduction and management. As such, PAGASA and the whole country can help protect the lives and properties of every Pilipino people.

PAGASA Gawad Award

The PAGASA Gawad Award as most outstanding employee of 2014 was conferred to Ms. Nancy T. Lance, Asst. Weather Services Chief, of the Finance, Planning and Management Division (FPMD), Ms Lance was given the top agency award for her exceptional performance and unquestionable dedication to duty. As the Agency's Planning Officer, she ensures that all PAGASA's reports on programs, projects and activities are prepared and submitted prior to the scheduled time frame for submission to the DOST, DBM, Senate, House of Representatives, NEDA and other government entities requiring the said reports. These reports are voluminous and tedious; requires thorough scrutiny and often times, given with limited time of preparation. With her position as Officer–in-Charge of the Plans and Program Development Unit (PPDU) and her proven commitment to work, Lance's significant accomplishment for the year was her relentless effort in pushing on PAGASA's partnership with GOOGLE in dissemination of public alerts in the Philippines. She gained commendation from the Google Manager for Crisis Response with her effort in working steadfastly with Google partners and PAGASA technical people. The PAGASA Technical Team worked on the project for five months and it is the fastest collaboration of Google amongst the nine (9) partner countries. The launching of Google of Public Alert in the Philippines was held on November 12, 2014. She also spearheaded the re-establishment of social media, preparation of Information Strategic System Plan (ISSP), among others, in relation to the attainment of PAGASA's goals for national development. Other significant accomplishments, includes the preparation and submission of the reportorial requirements of Performance-Based Bonus within the set deadline. She was commended by the Acting Deputy Administrator for Administration and Eng'g Services in various Agency Flag Raising and Retreat ceremonies for a job well-done. Also one of the members of

PAGASA's Performance Management Team, she prepared and monitored the necessary documents of the Strategic Performance Management System (SPMS) and submitted the same to the Civil Service Commission. Meanwhile, Mr. Vicente C. Manalo III of the Forecasting Section of Weather Division was chosen as the PAGASA Most Outstanding Employee for Operations and Services while Ms. Thelma A. Cinco was awarded the PAGASA most outstanding employee for the Research and Development.

Mr. Vicente C. Manalo III, Most Outstanding Employee for the Operations and Services

Ms. Thelma A. Cinco, Asst. Weather Services Chief, CAD, Most Outstanding Employee for the Research and Development

Ms. Nancy T. Lance, Asst. Weather Services Chief, FPMD, 2014 PAGASA Most Outstanding Employee

PMS' Tree Planting Activity for the Earth Day Celebration

PAHRODF-PAGASA Strategic Planning: Stakeholder's Conference, Sulo Riviera Hotel, 2 April 2014

PAHRODF-PAGASA Strategic Planning: Stakeholder's Conference, Sulo Riviera Hotel, 2 April 2014

Lecture on Weather Information Services (WIS), AO Conference Room, 22 May 2014

Lecture of Japanese Experts

PAHRODF-PAGASA Strategic Planning: Coaching Program for Head Office Core Team, PAGASA Amihan Conference Room, 22 May 2014

Strengthening awareness on typhoon and flood hazards

Mandated to mitigate disaster impact and reduce the loss of lives and properties, PAGASA spearheads the annual observance of Typhoon and Flood Awareness Week (TFAW).

With the 2014 theme "Kaakibat ng Bagyo: Malakas na Hangin, Malakas na Ulan, Baha, Pagguho ng Lupa, Storm Surges, Dapat Ligtas Tayo", TFAW aims to further create awareness on weather-related hazards and equip the general public with strengthened response to disasters.

By virtue of Presidential Proclamation 1535, PAGASA celebrates TFAW through a series of activities that will further promote essential information on typhoon and flood hazards and effective early warning systems.

To provide media practitioners and local government units (LGU's) with better understanding of the products and services of PAGASA, the Agency conducted a presentation of the Warning System Protocol. The presentation aims to provide the participants with guidelines concerning the communications protocol and to establish a cohesive flow of all activities during extreme weather events.

To transfer scientific knowledge into application, PAGASA, in coordination with LGU's, organized a Flood Drill to help participants gain a better grasp of the effects of flood hazards. The Flood Drill was conducted in a nearby coastal area to simulate a flooding scenario and its possible impacts.

Recognizing the significant role of media in information dissemination, PAGASA also conducted a seminar-workshop. The seminar aims to further provide the media with basic knowledge in meteorology and stress their role in disaster risk reduction and management or DRRM.

The TFAW, with support from the Philippines Science Journalists Association, Inc. (PSciJourn), other government agencies and the private sector, hopes to continue building informed and educated communities that can respond better to natural disasters with an end result of becoming a disaster resilient nation.

Bringing meteorology to the Senate

"I take note of this spirit of collaboration, and in fact, I emphasize that sharing of responsibilities is necessary and crucial in the disaster risk reduction strategy. I believe that the building of partnership with stakeholders will spell the difference in the effectiveness of disaster management in this country."

Addressing the participants of the Orientation-Seminar on the Role of PAGASA-DOST in DRRM for Senate Technical Staff on May 7, 2014, Senator Ralph G. Recto gave this encouraging message during the opening ceremony of the event.

With more than 100 participants in attendance, the orientation-seminar co-organized by the Science and Technology Committee of the Senate headed by Senator Rafael Recto, aimed to orient the Senate technical staff with the products and services of PAGASA and impart with them some basic knowledge in meteorology and warning systems.

Senator Recto also mentioned the problems encountered in disaster risk reduction. "The immensity of the problems confronting disaster risk reduction requires sharing of resources among the national and

local governments as well as the private sector. No one group can adequately respond to the challenge alone." He said.

DOST Undersecretary Fortunato dela Peña also gave enlightening opening remarks. He mentioned the importance of the Science and Technology community and how it can be further improved and utilized.

Joining Usec. dela Peña is DOST Assistant Secretary Oswaldo Santos who also showed support for the event.

In his message, Dr. Landrico U. Dalida, OIC of the Deputy Administrator for Operations and Services of PAGASA, expressed his gratitude to Senator Recto for proposing measures to improve the S&T sector such as the Senate Bill 1358 or the Hazard Allowance which seeks to increase the benefits of all S&T personnel working in government.

Emphasizing the role of DOST-PAGASA in DRRM, Dr. Dalida said that "the role of DOST-PAGASA is not only confined in the four corners of the office. We endeavor to educate the public, to increase their awareness, to build community resilience to disasters and reduce their vulnerability to natural hazards."

Providing informative and engaging lectures about meteorology, hydrometeorology and climate variability during the seminar-workshop were some of the seasoned officers and Senior Weather Specialists of PAGASA namely Mr. Niño A. Relos, OIC of CARDS-RDTD, Mr. Christopher F. Perez of the Weather Division, Mr. Roy A. Badilla of HMD, and Ms. Thelma A. Cinco of CAD.

Meanwhile, Dr. Esperanza O. Cayanan, OIC of the NRC-PRSD, discussed the Post Assessment on Typhoon Yolanda, Rainfall Warning System (RWS) and the PAGASA Way Forward.

Mr. Oscar V. Lizardo, Chief Science Research Specialist of Project NOAH also delivered a brief discussion about the NOAH and DREAM Project of DOST.

Aside from the seminar-workshop, a 2-day mini exhibit was also included featuring the products and services of the DOST such as the RxBox, DREAM, as well as some of the weather instrument of PAGASA. Senator Aquilino Pimentel, Jr. led the ribbon-cutting ceremony and viewing of the displayed items.

The participants composed of the legislative officers and technical group of the Senate expressed their appreciation for the event. As one participant said "In general the seminar gave value to its purpose in which they seek to inform us on a greater scale. It also gave great value to what and how we can prepare for disaster risk reduction management."

The orientation-seminar was just one of the many activities included in the Information, Education and Communication (IEC) Campaign of DOST-PAGASA regularly conducted throughout the country.

PAGASA declares strong support for the 8 DOST Outcomes

Thousands of yellow balloons flying up in the air, reminiscent of a Disney movie about a house being flown by balloons up filled with hopes and dreams.

Onlookers near Bicutan in Taguig City who were surprised to see the splendid sight might be wondering "What's with all the balloons?"

The balloons in the air were actually the highlight of an event organized by the Department of Science and Technology (DOST). Held last February 3, 2014 at the DOST Complex, the event entitled DOST Commitment Day gathered thousands of employees, officials and executives from the different attached agencies of the Department.

The event aimed to gather the full commitment of the S&T community in achieving all of the "8 DOST Outcomes" for national development with the use of science and technology (S&T) interventions to enhance eight areas, namely agriculture, MSMEs, industry, IT-BPM, government service, healthcare, human resources, and disaster mitigation.

Yellow was the color of the day as thousands of participants wore the official DOST Commitment Day shirts illustrating the 8 DOST Outcomes and bearing the Juan Direction tagline which refers to the Filipino's single, harmonized journey to progress.

Showing full support for the activity, PAGASA travelled to the DOST office in Taguig City early morning to take part in the preparation.

Headed by Dr. Vicente B. Malano, Acting Administrator of PAGASA, the delegates from the Agency excitedly waited for the activity to start.

After the flag ceremony, DOST Secretary Mario G. Montejo delivered his opening message. He reminded everyone to ensure that the country must be at a position of advantage in the global economy. "We have to find our niches in order to compete effectively in high-value added sectors mentioned in the eight major outcomes and reap the many economic benefits this can bring," Secretary Montejo said.

Secretary Montejo led the formal signing of the Declaration of Commitment on the event tarpaulin called the "Wall of Commitment". DOST officials and employee cooperative leaders signified their full support by signing on the tarpaulin as well.

For its declaration, PAGASA "commits to continuously improve its weather forecasting capability as a warning agency and focus on Hydrometeorological Disaster Risk Reduction activities for the benefit of the Filipino people." The declaration was signed by Dr. Malano and Mr. Ramon Agustin, president of the Philippine Weathermen Employees' Association (PWEA)

Before the simultaneous release of the balloons, the participants wrote down their personal wishes and commitments and tied them to their balloons.

Filling the sky that day were bright yellow-colored balloons, soaring high with dreams and promises.

PAGASA As Achiever

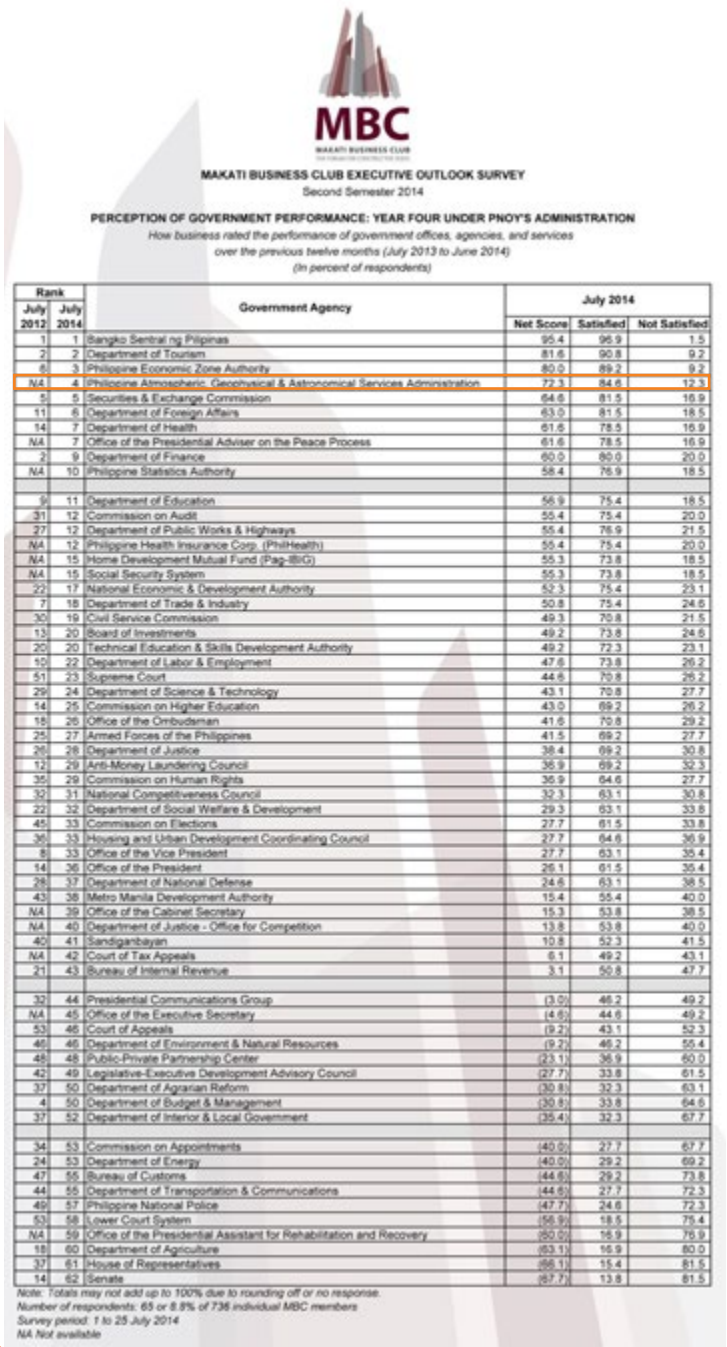
A remarkable achievement of PAGASA was receiving a Number 4 Ranking in the recent survey done the Makati Business Club (MBC) among the top performing government agencies is a giant leap for the agency.. The MBC official noted that PAGASA-DOST has made surprisingly impressive debuts in the business scorecard of government performance for the improvement in disseminating accurate weather forecasts (Source: http://www.mbc.com.ph).
PAGASA was among those cited in the survey which scored in impressive fashion. Virtually a constant outsider in the circle of efficiently performing agencies since the distant past, PAGASA streaked from nowhere to join the highly respected institutions in the bureaucracy owing to significant accomplishments it recently achieved. This is the first time that PAGASA joined the elite group of achievers posting a score of 72.3 to claim the fourth spot overall out of 63 agencies surveyed. Of those surveyed, 84.6 per cent said they were satisfied with the bureau's performance in the delivery of its mission and services. Getting the high approval rating of the country's revered business leaders on its perceived performance is not a traditional pat in the back but rather an absolute recognition. The MBC, founded in 1981, is committed in the promotion of the business sector's role in national development and in addressing social and economic issues affecting the Philippines. In recent past, it played a crucial part in carving the course of the nation's history.

MBC cited the country's official weather bureau, specifically, for its vast improvement in disseminating accurate weather forecasts to the public. Seriously challenged by credibility problems in the past, PAGASA has finally emerged as a dependable organization through the efforts of its competent and dedicated men and women who worked so hard to realize the dream of making the agency fulfill its noble mission. With sheer determination to overcome the logistics handicap, the agency survived the hard times by relying on patriotism as the rallying point.

In summary, PAGASA will now enjoy the comfort of earning the lasting respect of our people. The reputation that it has established will remain in the hearts and minds of the people because of its present status as a top performing agency. This much desired reputation would remain as the permanent inspiration of PAGASA in ensuring the sustainability of what has been achieved for the country. PAGASA has lived up and will always live up to its name.

Full results: Second Semester MBC Executive Outlook Survey

Makati Business Club Executive Outlook Survey for 2014 where PAGASA ranked No. 4 among the Top Performing Government Agencies



MBC

MAKATI BUSINESS CLUB EXECUTIVE OUTLOOK SURVEY

Second Semester 2014

PERCEPTION OF GOVERNMENT PERFORMANCE: YEAR FOUR UNDER PNOY'S ADMINISTRATION

How business rated the performance of government offices, agencies, and services over the previous twelve months (July 2013 to June 2014)

(In percent of respondents)

Rank		Government Agency	July 2014		
July 2012	July 2014		Net Score	Satisfied	Not Satisfied
1	1	Bangko Sentral ng Pilipinas	95.4	96.9	1.5
2	2	Department of Tourism	81.6	90.8	9.2
6	3	Philippine Economic Zone Authority	80.0	89.2	9.2
NA	4	Philippine Atmospheric, Geophysical & Astronomical Services Administration	72.3	84.6	12.3
5	5	Securities & Exchange Commission	64.6	81.5	16.9
11	6	Department of Foreign Affairs	63.0	81.5	18.5
14	7	Department of Health	61.6	78.5	16.9
NA	7	Office of the Presidential Adviser on the Peace Process	61.6	78.5	16.9
2	9	Department of Finance	60.0	80.0	20.0
NA	10	Philippine Statistics Authority	58.4	76.9	18.5
9	11	Department of Education	56.9	75.4	18.5
31	12	Commission on Audit	55.4	75.4	20.0
27	12	Department of Public Works & Highways	55.4	76.9	21.5
NA	12	Philippine Health Insurance Corp. (PhilHealth)	55.4	75.4	20.0
NA	15	Home Development Mutual Fund (Pag-IBIG)	55.3	73.8	18.5
NA	15	Social Security System	55.3	73.8	18.5
22	17	National Economic & Development Authority	52.3	75.4	23.1
7	18	Department of Trade & Industry	50.8	75.4	24.6
30	19	Civil Service Commission	49.3	70.8	21.5
13	20	Board of Investments	49.2	73.8	24.6
20	20	Technical Education & Skills Development Authority	49.2	72.3	23.1
10	22	Department of Labor & Employment	47.6	73.8	26.2
51	23	Supreme Court	44.6	70.8	26.2
29	24	Department of Science & Technology	43.1	70.8	27.7
14	25	Commission on Higher Education	43.0	69.2	26.2
18	26	Office of the Ombudsman	41.6	70.8	29.2
25	27	Armed Forces of the Philippines	41.5	69.2	27.7
26	28	Department of Justice	38.4	69.2	30.8
12	29	Anti-Money Laundering Council	36.9	69.2	32.3
35	29	Commission on Human Rights	36.9	64.6	27.7
32	31	National Competitiveness Council	32.3	63.1	30.8
22	32	Department of Social Welfare & Development	29.3	63.1	33.8
45	33	Commission on Elections	27.7	61.5	33.8
36	33	Housing and Urban Development Coordinating Council	27.7	64.6	36.9
8	33	Office of the Vice President	27.7	63.1	35.4
14	36	Office of the President	26.1	61.5	35.4
28	37	Department of National Defense	24.6	63.1	38.5
43	38	Metro Manila Development Authority	15.4	55.4	40.0
NA	39	Office of the Cabinet Secretary	15.3	53.8	38.5
NA	40	Department of Justice - Office for Competition	13.8	53.8	40.0
40	41	Sandiganbayan	10.8	52.3	41.5
NA	42	Court of Tax Appeals	6.1	49.2	43.1
21	43	Bureau of Internal Revenue	3.1	50.8	47.7
32	44	Presidential Communications Group	(3.0)	46.2	49.2
NA	45	Office of the Executive Secretary	(4.6)	44.6	49.2
53	46	Court of Appeals	(9.2)	43.1	52.3
46	46	Department of Environment & Natural Resources	(9.2)	46.2	55.4
48	48	Public-Private Partnership Center	(23.1)	36.9	60.0
42	49	Legislative-Executive Development Advisory Council	(27.7)	33.8	61.5
37	50	Department of Agrarian Reform	(30.8)	32.3	63.1
4	50	Department of Budget & Management	(30.8)	33.8	64.6
37	52	Department of Interior & Local Government	(35.4)	32.3	67.7
34	53	Commission on Appointments	(40.0)	27.7	67.7
24	53	Department of Energy	(40.0)	29.2	69.2
47	55	Bureau of Customs	(44.6)	29.2	73.8
44	55	Department of Transportation & Communications	(44.6)	27.7	72.3
49	57	Philippine National Police	(47.7)	24.6	72.3
53	58	Lower Court System	(56.9)	18.5	75.4
NA	59	Office of the Presidential Assistant for Rehabilitation and Recovery	(60.0)	16.9	76.9
18	60	Department of Agriculture	(63.1)	16.9	80.0
37	61	House of Representatives	(66.1)	15.4	81.5
14	62	Senate	(67.7)	13.8	81.5

Note: Totals may not add up to 100% due to rounding off or no response.
Number of respondents: 65 or 8.8% of 736 individual MBC members
Survey period: 1 to 25 July 2014
NA Not available

PAGASA, nakipagtulungan sa Komisyon ng Wika sa pagsasalin ng mga termino

24 Nobyembre 2014 - Upang mas maunawaan at maintindihan ng mamamayang Pilipino ang mga teknikal na termino na ginagamit ng PAGASA sa pagtataya ng panahon, nagsagawa ang Komisyon ng Wika (KWF) ng pakikipagpulong sa ilang forecasters at specialists ng Ahensya.

Kasama ang ilang opisyal ng KWF, sa pangunguna ng Tagapangulong Virgilio S. Almario, at ni Dr. Michael M. Coroza, propesor ng Ateneo de Manila, naisakatuparan ang konsultasyon sa pamamagitan ng isang buong araw na pagsusuri sa bawat meteorological terms.

Ang kasalukuyung tatlongdaan dalawampu't dalawang (322) entri ay isinaayos sa anyong diksyunaryo na may pagpapantig, bantas at etimolohiya ng salita. May katumbas sa salitang Filipino ang ilang pangunahing katawagan tulad ng bagyo para sa typhoon at unos para sa storm. Samantala, ang storm surge naman ay tinumbasan ng salitang daluyong bagyo.

Ayon rin sa tagubilin ni Mr. Almario, ang mga katawagan ay dapat isaayos sa anyong diksyunaryo na Filipino ang pangunahing entri at siyang bibigyan ng kahulugan o maikling paglalarawan samantalang Ingles ang pangalawang entri at tutumbasan sa Filipino.

Ilang katutubong salita din ang isinalang-alang sa pagtutumbas sa Filipino katulad ng siyam-siyam, taog, tarahiti, tarakitek at arammuk.

Upang mas masuri at mahimay ang pagsasalin ng mga termino, ilang pagpupulong pa ang isasagawa ng PAGASA at KWF, kasama na ang planong pagkakaroon ng seminar-workshop ukol sa proyekto na ito.

Congress' S&T Committee collaborates with DOST-PAGASA for disaster preparedness seminar

With the onset of the rainy/typhoon season and the prevailing weather system, the Southwest Monsoon or "Habagat", the Science and Technology Committee of the Philippine Congress, chaired by Cong. Victor Yu, co-organized the conduct of the Orientation Seminar on the Role of DOST-PAGASA in DRRM and Climate Change Adaptation (CCA).

Held at the House of Representatives in Quezon City, the event aimed to impart further understanding on basic meteorology, different weather and disaster warnings, useful applications, geological hazards, as well as the significance of strengthening DRRM-CCA practices in the country.

In his welcome remarks, Cong. Mariano Piamonte Jr. said, "this orientation/seminar on the role of PAGASA and PHIVOLCS in Disaster Risk Reduction and Management (DRRM) and climate change adaptation is very timely. Being geographically located in the Northwestern Pacific Basin, the Philippines is prone to natural hazards such as storm surge, extreme rainfall, inland and coastal flooding, and strong winds."

Cong. Piamonte, the Vice-Chair for the S&T Committee considers meteorological and hydrological hazards as the most destructive in terms of human casualties

and damage to agriculture, infrastructures, properties and livelihood. He also reiterated the importance of PAGASA as the country's government agency in charge of providing timely, reliable and accurate weather information.

During the orientation-seminar, Dr. Vicente Malano, PAGASA Acting Administrator, said that the Agency, in collaboration with the other warning agencies of the country such as PHIVOLCS, regularly conducts an Information, Education and Communication (IEC) Campaign, particularly in hazard-prone areas around the country.

In his message, Dr. Malano said "the role of DOST-PAGASA is not only confined in the four corners of the office. We endeavor to educate the public, increase their awareness and disaster preparedness, hence building community resilience and reducing their vulnerability to natural hazards."

Dr. Malano added that as they continue to increase their technical skills and develop new batch of experts, the state weather bureau also hopes to have the latest technology and equipment to aid them in forecasting the weather and avoid a blind spot for incoming weather disturbances. "We look forward to a time when weather monitoring equipment is evenly spread out in all parts of the country", Dr. Malano said.

Last June, the PAGASA Modernization Bill was unanimously approved on third reading by the Congress. The objective of the bill includes the upgrade of physical resources and operational techniques through the acquisition of state-of-the-art instruments, equipment, and facilities and to raise the salary and compensation of the officers and employees of PAGASA to make their pay competitive in the global market.

A total number of one hundred thirty five (135) participants were in attendance during the seminar-orientation composed of Committee Secretaries, Chief-of-Staff and other Technical Staff of the House of Representatives.

PAGASA Sport Fest

In line with the Wellness Program of the government, PAGASA conducted a badminton tournament in April 2014 which was spearheaded by the Philippine Weather Employees Association (PWEA). The main purpose of the tournament is to develop camaraderie and promote fun and physical fitness among the employees. It and encouraged participation of employees as a way to stay healthy and fit and to foster and still values in the players especially on discipline, teamwork, fair play and sportsmanship. To ensure greater participation of the employees, PWEA requested the management for the employees to be allowed to attend the scheduled games on official time. The employees were grouped into five (5) color teams violet, yellow, blue, green and black. This year, the champion was the violet team with 2nd place blue team and 3rd place black team.

Violet Team emerged as Champion in the 2014 Badminton Tournament (seated, L-R Mr. I.F. Furio, Mr. R.G.Q. Amador, Mr. R.T. Binalayo, Mr. W.H. Tuazon, 2nd row, L-R Ms. L.S. Mercado, Mr. T.M.T. Singun, Ms. E.P. Jacila, Ms. R.D. Paulo, Ms. M.L.A.D. Miranda, Ms. A.L.S. Solis, Ms. B.J.D. Colobong, Ms. R.A. Saadvedra

2014 Badminton Tournament

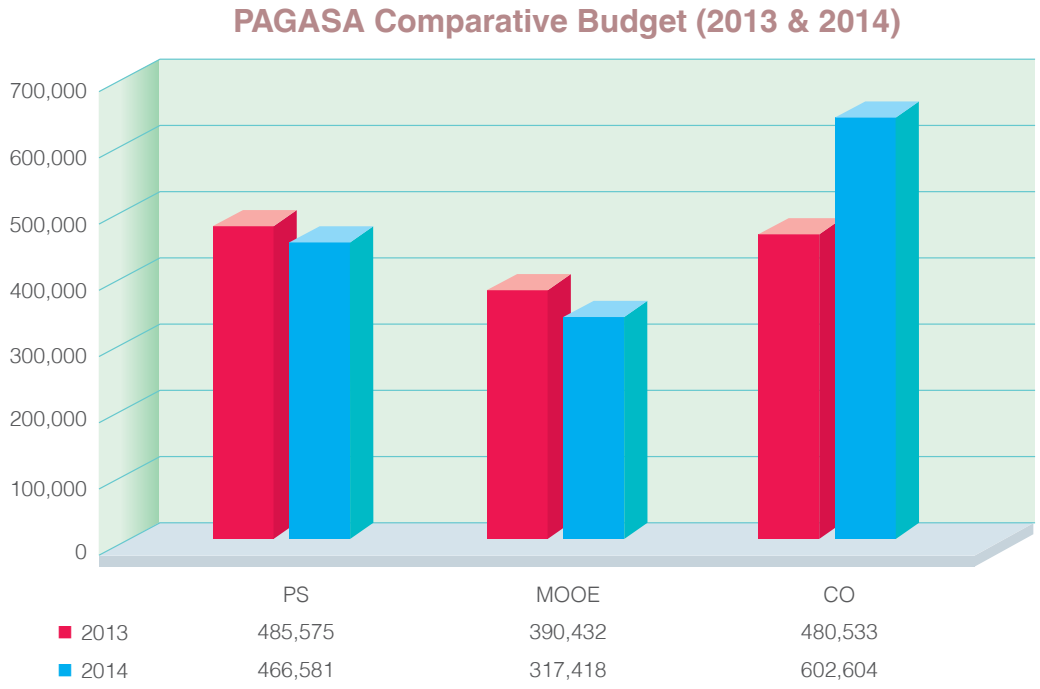
Human Resources and Budget

Budget

The total budget of the agency for 2014 was ₱1,386,603,000, which is 2.2% higher than 2013. The increase in this year's expenditures can be attributed to Maintenance and Other Operating Expenses (MOOE) of the General Appropriations Act (GAA) of the agency.

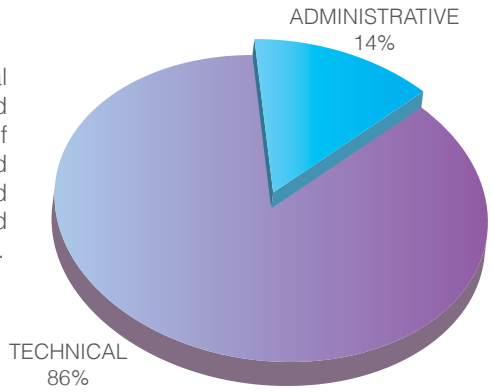
In terms of national expenses classification, the expenditure was broken down as follows: ₱466,581,000 for Personal Services (PS), ₱317,418,000 for Maintenance and Other Operating Expenses (MOOE) and ₱602,604,000 for Capital Outlay (CO).

	2013	2014	%
PS	485,575	466,581	-3.9%
MOOE	390,432	317,418	-18.7%
CO	480,533	602,604	25.4%
Total	**1,356,540**	**1,386,603**	**2.2%**



Human Resources

The PAGASA workforce has a total of 975 with 87 Job Order (JO) and 57 project based personnel. Of the 975, 836 or 86% performed scientific & technical tasks and functions while 139 or 14 % worked in administrative support activities.

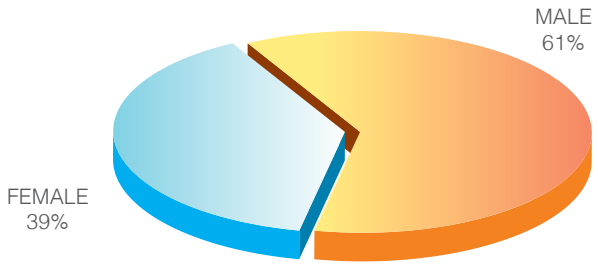


SUMMARY OF PAGASA PERSONNEL

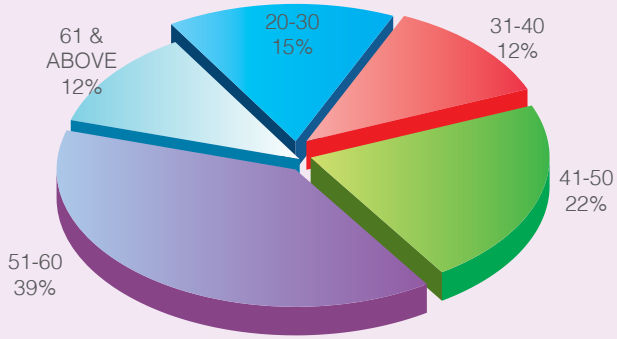
	NO. of Personnel	Male	Female	%
ADMINISTRATIVE POSITIONS	139	71	68	14%
TECHNICAL POSITIONS	836	526	310	86%
GRAND TOTAL	**975**	**597**	**378**	**100%**

DISTRIBUTION OF PERSONNEL BY SEX

CATEGORY	NO. OF PERSONNEL	%
MALE	597	61%
FEMALE	378	39%
TOTAL	**975**	**100%**



Personnel Distribution by Age



DISTRIBUTION OF PERSONNEL BY AGE

AGE	NO. OF PERSONNEL	MALE	FEMALE	%
20-30	149	97	52	15%
31-40	119	73	46	12%
41-50	215	137	78	22%
51-60	378	229	149	39%
61 & ABOVE	114	61	53	12%
TOTAL	**975**	**597**	**378**	**100%**

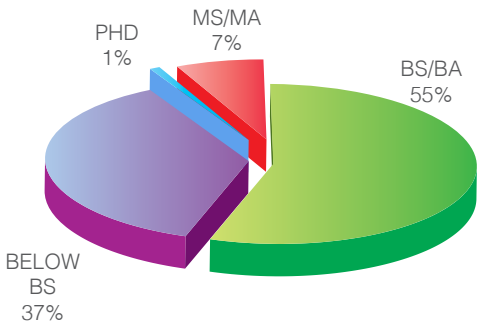
AVERAGE AGE: 47

DISTRIBUTION OF PERSONNEL BY EDUCATION, SEX AND AGE

Reference: PLANTILLA OF PERSONNEL as of DECEMBER 31, 2014

LEVEL OF EDUCATION	MALE	FEMALE	TOTAL NO. OF PERSONNEL	%	AGE				
					21-30	31-40	41-50	51-60	61 & ABOVE
PHD	5	4	9	0.9%	0	1	0	7	1
MS/MA	31	36	67	6.9%	3	15	21	24	4
BS/BA	305	232	537	55.1%	131	76	124	166	40
BELOW BS	256	106	362	37.1%	15	27	70	181	69
TOTAL	**597**	**378**	**975**	**100%**	**149**	**119**	**215**	**378**	**114**

Personnel Distribution by Education

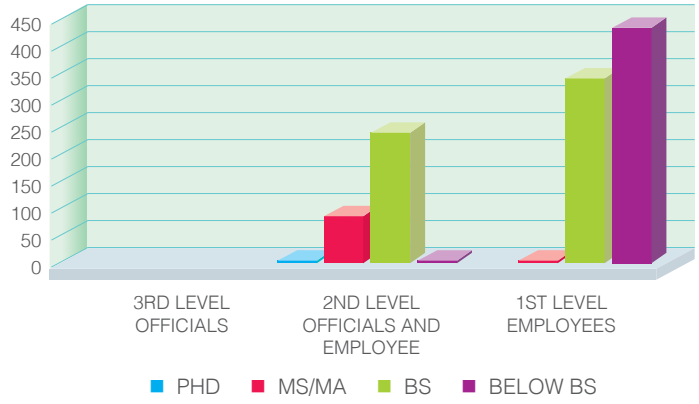


DISTRIBUTION OF PERSONNEL BY POSITION LEVEL, SEX AND EDUCATION

	SEX			EDUCATION				
	MALE	FEMALE	TOTAL	PHD	MS/MA	BS	BELOW BS	TOTAL
3rd Level Officials	2	1	3	2	1	0	0	3
2nd Level Officials and Employees	167	130	297	5	61	226	5	297
1st Level Employees	428	247	675	2	5	311	357	675
TOTAL	**597**	**378**	**975**	**9**	**67**	**537**	**362**	**975**

Personnel Distribution by Sex and Level of Position

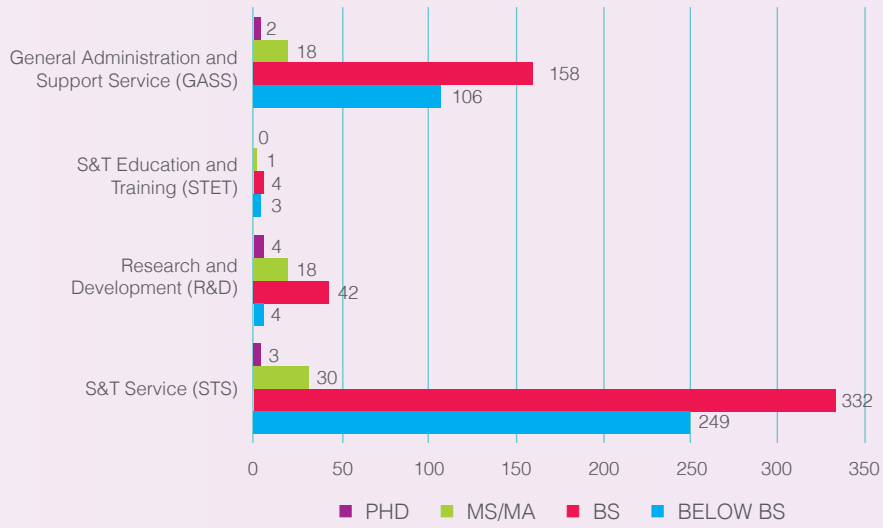
Personnel Distribution by Education and Level of Position



DISTRIBUTION OF PERSONNEL BY S&T FUNCTION

CATEGORY OF PERSONNEL	LEVEL OF EDUCATION				TOTAL
	Below BS	BS/BA	MS/MA	PhD	
S&T Service (STS)	249	332	30	3	614
Research and Development (R&D)	4	42	18	4	68
S&T Education and Training (STET)	3	4	1	0	8
General Administration and Support Service (GASS)	106	159	18	2	285
TOTAL	**362**	**537**	**67**	**9**	**975**

Distribution of Personnel by S&T Function & Education



PAGASA Mid-Term Plans

PAGASA recognizes the changing physical environment and the progressive scientific and technological development that need integration in the agency's development activities, and envisions the future with more challenges and opportunities which are imperative in meeting the demands of the global community. To meet these challenges, PAGASA has identified its sets of priorities, consistent with the DOST's vision and within the framework of the Philippine Development Plan 2011-2016, specifically, on climate change adaptation, and disaster preparedness and hazard mitigation. To achieve its main goal of improved and enhanced services to better serve the needs of the people, PAGASA has identified a set of priority strategies and programs for 2014-2018 in the concluded Strategic Planning activity (supported by HRODF) held from November 2013 to June 1014 as follows:

IMPROVE FORECASTING SYSTEM

Program:

1. Establishment of robust all weather meteorological and hydrological telecommunication system (ICT)

   - To establish and enhance physical network connectivity
   - To establish WMO Information System (WIS) implementation plan in the Philippines
   - To put in place modernized observing systems

2. Densification /procurement/modernization of equipment and network observing systems based on standard specification

   - To put in place a modernized observing systems

DEVELOP AND IMPLEMENT FIELD MAINTENANCE AND CALIBRATION PROCEDURES FOR BASIC AND OTHER INSTRUMENTS

Program:

1. Formulation of Manual and Adoption of WMO Recommended Practices on field maintenance and calibration procedures/schedule

   - Publication of Manual of Surface Synoptic Observation (MASSO) Vols I, II, II and IV (Observation Practices, coding and reporting system; and field maintenance and calibration)

2. Procurement program for calibration equipment

   - Finalization of procurement program for calibration equipment

STRATEGY #3

PROGRAM FOR ADVANCING SCIENTIFIC RESEARCH AND APPLICATION AND LINKAGES

Program:

1. Enhancement/Establishment of strong linkages and partnerships with local and international academe, organizations and advanced meteorological research centers for conduct of collaborative research
   - To strengthen 90% of existing /partnership within the science community/partnership per year
2. Conduct of Research in support to operations
   - To conduct 4 researches/studies per year in support to operations for publication and /or operationalization
3. Full utilization Data from State-of-the-art Equipment for R & D
   - To develop new applications using data from state-of-the-art equipment and to adapt data assimilation techniques

STRATEGY #4

ENHANCE HUMAN RESOURCE AND ORGANISATION DEVELOPMENT SYSTEMS

Program:

1. Implementation of Competency-based Recruitment and Selection (CBRS), Learning & Growth
   - Rationalize CB recruitment and selection
2. Strengthening HR-OD Policies
   - Improvement of HRD policies
3. Enhance Human Resource and Organization Development Systems
   - Improvement of HRD policies
4. Strict implementation of Strategic Performance Management System (SPMS)
   - Full implementation of SPMS
5. Establishment and implementation of Quality Management System : ISO certification
   - Acquire ISO: 9001 certification
6. Development of competitive remuneration package
   - Attract the best and the brightest and maintain competent workforce

STRATEGY #5

PROMOTE PAGASA BRAND AS THE PREFERRED PROVIDER OF WEATHER AND OTHER RELATED SERVICES AND ADVOCATE FOR SUSTAINABLE SUPPORT

Program:

1. Institutionalize the conduct of a layminized information, education and communication (IEC) campaign
    - To establish understanding of NDRMMC, LGUs, media, and household in Metro Manila (pilot area) from 60% to 65%
2. Establishment of advocacy program for executive, legislative branches and LGUs and a pro-active system to alert decision makers, media and the general public on impending extreme weather events
    - To develop an effective pro-active alert system for government, DRRMC, Media (local and international) LGUs and household

STRATEGY #6

STRENGTHEN EFFECTIVE UTILIZATION OF RESOURCES

Program:

1. Program for effective and efficient utilization of resources
    - 100% utilization of resources

PAGASA Officials

Members of the Executive Staff

VICENTE B. MALANO, Ph.D.
Acting Administrator
929-4865/434-9040
vmalano@pagasa.dost.gov.ph

CATALINO L. DAVIS, MPA
Acting Deputy Administrator for Administrative and Engineering Services
434-2579/434-9039
cl_davis1999@yahoo.com

LANDRICO U. DALIDA, JR., Ph.D.
Officer-In-Charge
Office of Deputy Administrator for Operations and Services
434-5886/434-8975
Landrico_dalidajr@yahoo.com

FLAVIANA D. HILARIO, Ph.D.
Acting Deputy Administrator for Research and Development
929-1953/434-2537
fhilarioph@yahoo.com

ESPERANZA O. CAYANAN, Ph.D.
Officer-In-Charge
Weather Division
922-1996/927-1541
eocayanan@gmail.com

MAXIMO F. PERALTA
Officer-In-Charge
Hydro-Meteorology Division
926-5060/926-6970
pmaximo64@yahoo.com

EDWIN F. MANRESA
Officer-In-Charge
Engineering and Technical Services Division
928-6461/435-5303
efmanresa@yahoo.com

CYNTHIA P. CELEBRE, Ph.D.
Chief
Research & Development and Training Division
434-2675/434-4677
cynthia_celebre@yahoo.com

LILLIBETH B. GONZALES, CPA
Chief
Financial, Planning and Management Division
434-2632/434-1882
lillibet2k@yahoo.com

EDNA L. JUANILLO
Officer-In-Charge
Climatology and Agrometeorology Division
434-9024/435-1675
ejuanillo@yahoo.com

SYLVIA N. DAVIS, MPA
Chief
Administrative Division
436-4033/434-3830
viaviang@yahoo.com

PAGASA Regional Services Divisions

BONIFACIO G. PAJUELAS, Ph.D.
Officer-In-Charge
National Capital Region - PAGASA Regional Services Division
PAGASA Science Garden, Agham Rd., Diliman, Quezon City
(02) 433-1456
bgpajuelas@gmail.com

FREDOLINA D. BALDONADO
Officer-In-Charge
Northern Luzon - PAGASA Regional Services Division
Capitol Site, Tuguegarao City, Cagayan
(02) 927-5343/(078) 304-1994
fredolina_baldonado@yahoo.com

OSCAR C. TABADA
Officer-In-Charge
Visayas - PAGASA Regional Services Division
Cebu PAGASA Complex, Airport Rd., Lapu-Lapu City, Cebu
(032) 340-4143/ (032) 340-1868
oscartabada@yahoo.com

LILIAN N. GUILLERMO
Officer-In-Charge
Southern Luzon - PAGASA Regional Services Division
Airport Site, Legazpi City, Albay
(052) 481-4471/(052) 481-4455
lilian_guillermo@yahoo.com

RICARDO A. MERCADO
Chief
Mindanao - PAGASA Regional Services Division
Molugan, El Salvador City
(08822) 745-5164/(088) 555-0485
ric_mercado58@yahoo.com

PAGASA KO

Ganap mong adhikain
Kaligtasan ng buhay
Sa pagbabago't
Pagtugon ng kalikasan

Agham na kaakibat ng talino at husay
Sa pinsala'y nagsisilbing
pananggalang

KORO

Sa pagdilim ng mga ulap
Sa gitna man ng unos ay kabalikat
Kaagapay kang lubos
Sa pagtaas ng mga alon
At maging sa tag-tuyo
Sa bawat panahon
Makakaasang PAGASA ko

Ang `yong paglilingkod
Sa bayan na pinag-inam
Ay katiyakang dulot ay kapanatagan

Agham na kaakibat ng talino at husay
Sa pinsala'y nagsisilbing
pananggalang

Sa pagdilim ng mga ulap
Sa gitna man ng unos ay kabalikat
Kaagapay kang lubos
Sa pagtaas ng mga alon
At maging sa tag-tuyo
Sa bawat panahon
Makakaasang PAGASA.....

Sa pagdilim ng mga ulap
Sa gitna man ng unos ay kabalikat
Kaagapay kang lubos
Sa pagtaas ng mga alon
At maging sa tag-tuyo
Sa bawat panahon
Makakaasang PAGASA ko

Production Staff

Plans and Programs Development Unit (PPDU)

Nancy T. Lance
Renely L. Basiño Ines Liberty M. Agdeppa
Roque E. Adora Ramon G. Agustin
Cynthia R. Paltuob

DEPARTMENT OF SCIENCE & TECHNOLOGY
Philippine Atmospheric, Geophysical &
Astronomical Services Administration

PAGASA Science Garden
Agham Road, Diliman, Quezon City 1100

Tel. Nos:
434-9040 / 927-9308

Fax. No:
929-4865 / 434-2696

Website:
www.pagasa.gov.ph

Dial-A-Weather:
434-ULAN (8526)

Follow us on
twitter.com/#!/dost_pagasa

Like us on
facebook.com/pages/dost_pagasa