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

PAGASA

The Weather and Climate Authority

WE HEAL AS ONE

ANNUAL REPORT 2020

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FOREWORD

Newfound hope in PAGASA.

As the Philippines began facing the threat of the Covid-19 pandemic, PAGASA endured and remained steadfast despite norm changes and transitions of government policies in alleviating the impacts of the virus infection.

On March 16, 2020, when the nationwide lockdown and community quarantine started, our commitment to deliver timely, accurate, and pertinent information persevered by strengthening the utilization of the various social media and messaging platforms. Challenging is the task of balancing public service and preservation of health and life against the deadly virus. And, through the application of different alternative work arrangements, men and women of PAGASA steadily carried out their oath as public servants. Moreover, in parallel with the varying community quarantine restrictions, preventive measures and infection monitoring and handling procedures were imposed to make the workplace safe.

Aside from the ongoing pandemic, the formidable spirit of the men and women of PAGASA was never dampened by the onslaught of three consecutive strong typhoons. Despite uncompromising aftermaths affecting project-related works and endangering field stations and offices, achieving recovery and improvement was gradual. Thanks to the teamwork and selfless efforts of every individual.

Not all circumstances are controllable, but controllable is the method of how they are handled and managed. Hence, acclamation to all who shared and gave the most effort in achieving uninterrupted public service. Those eager to endure remote work and are unwavering to succeed despite situations deemed challenging and impossible. To those who performed and realized what seemed unachievable, those who physically report for work daily, their commendable contributions are very much acknowledged - a glorious salute to all.

In all the hopeless side of this story, events that we will never forget, we remain to raise our guards in the fight against any challenges. On the other hand, we learned that we have a known ally – we have each other. And as the pandemic and many more things are about to happen, we will never give up and lose hope. We didn't just survive – we thrived.

We are PAGASA, and we are the Weather Authority.

ACRONYMS AND ABBREVIATIONS

ACIAR	–	Australian Centre for International Agricultural Research
AD	–	Administrative Division
ADBI	–	Asian Development Bank Institute
AEWs	–	Agricultural Extension Workers
ASEANCOF	–	Association of Southeast Asian Nation Climate Outlook Forum
AWOS	–	Automated Weather Observing System
CAD	–	Climatology and Agrometeorology Division
COVID -19	–	Corona Virus Disease 19
CSC	–	Civil Service Commission
DepEd	–	Department of Education
DILG	–	Department of Interior and Local Government
DOST	–	Department of Science and Technology
DRRM	–	Disaster Risk Reduction and Management
ETSD	–	Engineering and Technical Services Division
FEU HS	–	Far Eastern University High School
FEWS	–	Flood Early Warning System
FFWS	–	Flood Forecasting and Warning System
FPMD	–	Financial Planning Management Division
GAD	–	Gender and Development
GSP	–	Girl Scouts of the Philippines
HFRs	–	High Frequency Radars
HRDP	–	Human Resource Development Program
IATF-EID	–	Inter Agency Task Force on Emerging Infectious Diseases
IEC	–	Information, Education and Communication campaign
JMA	–	Japan Meteorological Agency
LFT	–	Local Farmer Technicians
LGU	–	Local Government Unit
NMS	–	Numerical Modeling Section

NOAA	–	National Oceanographic and Atmospheric Administration
NRDC	–	National Research and Development Conference
NSTW	–	National Science and Technology Week
ORAOHRA	–	Omnibus Rules on Appointments and Other Human Resource Actions
PAGASA	–	Philippine Atmospheric Geophysical and Astronomical Services Administration
PCIEERD	–	Philippine Council for Industry, Energy, and Emerging Technology Research and Development
PDRF	–	Philippine Disaster Resilience Foundation
PIU	–	Public Information Unit
PPDU	–	Plans and Programs Development Unit
PRIME HRM	–	Program to Institutionalize Meritocracy and Excellence in Human Resource Management
PSciJourn	–	Philippine Science Journalists Association, Inc.
PSCP	–	Public Service Continuity Plan
RCMs	–	Regional Climate Models
RDTD	–	Research and Development and Training Division
SEACLID/CORDEX SEA	–	Southeast Asia Regional Climate Downscaling/ Coordinated Regional Climate Downscaling Experiment South East Asia
SHARPpy	–	Sounding and Hodograph Analysis Research Program in Python
SOPs	–	Standard Operating Procedures
SPC	–	Storm Prediction Center
SST	–	Sea Surface Temperature
STEM	–	Science, Technology, Engineering, and Mathematics
SUCs	–	State Universities and Colleges
TC	–	Tropical Cyclone
TCLVs	–	Tropical Cyclone-like Vortices
TFAW	–	Typhoon and Flood Awareness Week
UNESCO (ICHARM)	–	United Nations Educational, Scientific and Cultural Organization (International Centre for Water Hazard and Risk Management)
WD	–	Weather Division
WNP	–	Western North Pacific
WRF	–	Weather Research and Forecasting

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Mandate / Mission / Vision / Values / Functions

MANDATE

Provide adequate, up-to-date data, and timely information on atmospheric, astronomical and other weather-related phenomena using the advances achieved in the realm of science to help government and the people prepare for calamities caused by typhoons, floods, landslides, storm surges, extreme climatic events, and climate change, among others, to afford greater protection to the people.

Provide science and technology-based assessments pertinent to decision-making in relevant areas of concern such as in disaster risk reduction, climate change adaptation and integrated water resources management, as well as capacity building.

Ensure that the country fulfills its commitments to international meteorological and climate change agreements.

MISSION

We deliver reliable and relevant weather-related information, products and services to develop communities resilient to typhoons, floods, rain-induced landslides, storm surges, extreme climatic events, climate change and astronomical hazards.

VISION

The Center of Excellence for weather-related information and services helping develop a disaster and climate-resilient nation

VALUES

Spirituality
Patriotism
Integrity
Innovation
Commitment
Excellence

FUNCTIONS

Maintains a nationwide network pertaining to observation and forecasting of weather and flood and other conditions affecting national safety, welfare and economy;

Undertake activities relative to observation, collection, assessment and processing of atmospheric and allied data for the benefit of agriculture, commerce and industry;

Engage in studies of geophysical and astronomical phenomena essential to the safety and welfare of the people;

Undertake researches on the structure, development and motion of typhoons and formulate measures for their moderation; and

Maintain effective linkages with scientific organizations here and abroad and promote exchange of scientific information and cooperation among personnel engaged in atmospheric, geophysical, astronomical and space studies.

PERFORMANCE PLEDGE AND FEEDBACK AND REDRESS MECHANISMS: 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 **(http://bagong.pagasa.dost.gov.ph)** or through SMS, and our trunk line **(02) 8284-0800**, follow us on twitter @dost-pagasa, ***https://twitter.com/dost_pagasa***. Like us on facebook DOST_pagasa ***https://www.facebook.com/PAGASA.DOST.GOV.PH***

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.

FEEDBACK AND REDRESS MECHANISMS

Please let us know how we have served you by:
Accomplishing our Feedback Form available at the lobby and put in the drop box located at the front desk or give the form to the division concerned.

Sending your feedback through our website ***(http://bagong.pagasa.dost.gov.ph)*** or call our trunk line **(02) 8284-0800**, follow us on twitter @dost-pagasa, ***https://twitter.com/dost_pagasa***. Like us on facebook DOST_pagasa ***https://www.facebook.com/PAGASA.DOST.GOV.PH***
Your written/verbal complaints shall immediately be attended to.

Thank you for helping us improve our service.

Message

By the DOST Secretary

The year 2020 has brought tough challenges and realizations to us and to our nation as a whole. Despite the pandemic, my confidence in PAGASA remained as their tenacity to serve the nation is undeniably intact.

They outdid their performance in 2019, marking a 51.2 km forecast track error over their last year's 89 km forecast track error at a 24-hour lead time. This means that the margin of error was lessened as compared to the actual track of Tropical Cyclones in 2020 considering our experience with Typhoon Quinta and Super Typhoons Rolly and Ulysses.

To serve their mandate while coping with the limitations brought about by the pandemic, PAGASA utilized online platforms so that information dissemination would not be hampered. They took advantage of the scope of social media platforms to transmit weather and climate information with having millions of followers who have trusted PAGASA over the years. They have conducted information education campaign communications through the internal, regional, and national Climate Outlook forums that provides climate information updates online and a webinar on DOST-PAGASA 24/7 operations on a new normal typhoon season which was done during the celebration of the Typhoon and Flood Awareness Week.

Lastly, I wish to convey my warmest congratulations to PAGASA for having produced and published the "State of the 2018 Philippine Climate" in January 2020 in partnership with the Oscar M. Lopez Center for Climate Change Adaptation and Disaster Risk Management Foundation Inc.

The commendable efforts of PAGASA is a testimony of its dedication and commitment. PAGASA will always be here to serve the public and the DOST will remain supportive.

Hon. Fortunato T. de la Peña
DOST Secretary

By the DOST Undersecretary for S&T Services

Another historic and challenging year confronted our nation as it battled the impact of the global pandemic. Yet, despite the situation, it is inspiring to see the utmost sincerity and dedication of PAGASA's men and women in providing services and accomplishing its mandated tasks.

In March, the unanticipated rapid spread of the lethal COVID-19 virus almost shut down the mobility of people, including government services. Several government projects were affected due to travel restrictions implemented to prioritize the safety of the people.

Despite the threat of the virus on everyone's health, I commend PAGASA for sustaining the services, particularly the issuance of weather advisories and forecasts during the occurrence of tropical cyclones Ambo and Butchoy in the first semester and Quinta, Rolly, Ulysses in the second semester of 2020.

The combined devastating impact of the passing tropical cyclones and the pandemic is overwhelmingly burdensome for the country. However, with an average forecast track error of 51.2 kms. (for typhoons) and 62.4 kms. (for tropical storms) at a 24-hour lead time, preparations had been executed in advance by local government units and various organizations/groups to mitigate the destructive effects of disasters on properties and human lives.

Vital to disaster preparedness and response is the timely and effective communication of advisories and warnings to the general populace. Notwithstanding the setbacks brought by the pandemic, commendable are the PAGASA's efforts to ceaselessly engage communities and people, educating and informing them about the hazards and impacts brought by inclement weather.

Thank you for keeping your ideals intact. It is only through shared efforts will the goal of a climate and disaster-resilient society be realized. Thank you, PAGASA, for playing a major role in the road to disaster and climate change resiliency. You are one of the unsung heroes of today.

Dr. Renato U. Solidum, Jr.
Undersecretary for S&T Services

By the DOST-PAGASA Administrator

"We are troubled on every side, yet not distressed; we are perplexed, but not in despair; persecuted, but not forsaken; cast down, but not destroyed" (2 Corinthians 4:8-9)

When the worldwide COVID 19 pandemic directly affected the nation in 2020, doubts and uncertainties infiltrated the minds of the many. Dynamism became the government's major key to take over the situation so that enlightenment and security is felt by the people, in the most possible way. Government projects are adjusted to ensure that their operation would not be impeded considering the effects of the global pandemic. Meaningfully, these situations fittingly symbolize our logo especially the colors it represents: black stands for the unknown, white for truth and enlightenment and blue for progress.

Alongside the pandemic are disastrous typhoons such as occurrence of Tropical Cyclones Quinta, Rolly and Ulysses, making 2020 a real challenge. Despite all of these, PAGASA remained steadfast, embodying the responsibility to provide accurate information crucial to planning and decision making for the public's safety. We have proven this as the margin of error versus actual track was reduced to a remarkable 51.2 km forecast track error at a 24-hour lead time, way better than the World Meteorological Organization (WMO) standard of 120km.

The significant improvement we have done involves the mastery and dedication of the Agency's workforce together with the improvement of our physical resources.

Doppler Weather Radars became the face of PAGASA ever since, as they are reliably used to provide information on the movement and intensity of tropical cyclones, short-lived weather systems and other events such as monsoons. Thus, we aimed to establish 20 Doppler Weather Radars, currently having 17 systems and targeting to complete three more stations in Agno, Masbate and Laoang.

PAGASA broadened the early warning systems in coastal areas, having established 29 High Frequency Radars (HFRs) nationwide which includes the completion of five sites in Jagna (Bohol), Mambajao (Camiguin), Malimono (Surigao del Norte), Dinapigue (Isabela) and Dipaculao (Aurora). HFRs remotely map the spatial distribution and time-based development of waves and currents of the nearshore coastal ocean.

It is also imperative to strengthen our flood monitoring and warning services, thus, I am proud to mention that we have established Flood Forecasting and Warning System (FFWS) in 13 major river basins and is completing five more FFWS sites. This will address the growing need of the public to receive advance flood warnings knowing that there are geographical areas susceptible to inundation.

In relation to this, the Agency is also completing the establishment of short-ranged X-Band Doppler Radars in seven sites, which is an effective tandem of FFWS to provide advance flood and flashfloods information. It will also enhance the mosaic radar images including those of S and C-Band Doppler Radars.

Even before the pandemic, PAGASA has started establishing PAGASA Data Center in Mactan Cebu, the Agency's disaster recovery facility. In case a malfunction would happen in Central Office due to man-made or any nature-driven disaster, we could still continue our operation with this mirror facility. This is how pliant we are to whatever disaster we may encounter in the future.

With the current initiatives we have, I desire for the never-ending compassion of PAGASA's men and women. I wish to keep the fire in ourselves burning to enliven our mandate: to serve the nation with integrity.

Mabuhay and God bless.

Dr. Vicente B. Malano
Administrator

PAGASA: A Glimpse of 2020

The Weather and Climate Authority

Weather

732
Public Weather Forecasts

732
Shipping Forecasts

64
Weather Advisories

380
Gale Warnings

1,845
Sigment Information

Tropical Cyclone

11
Advisories

273
Severe Weather Bulletins

234
Tropical Cyclone Warning for Shipping (TCWS)

Agri-Weather

732
Daily Farm Weather Forecast and Advisories (FWFA) to **181,078** recipients

36
Ten-day Regional Agri-Weather Information to **8,868** recipients

Flood

1,314
General Flood Advisories for the non-telemetered river basins

199
Flood Bulletins for the telemetered Pampanga, Agno, Bicol and Cagayan (PABC) river basins

Climate

12
National Climate Outlook Forum

11
Provincial Climate Outlook Forum

12
Monthly Assessment and Outlook

2
Seasonal Climate Outlook

Trainings

9
Technical in-house training courses

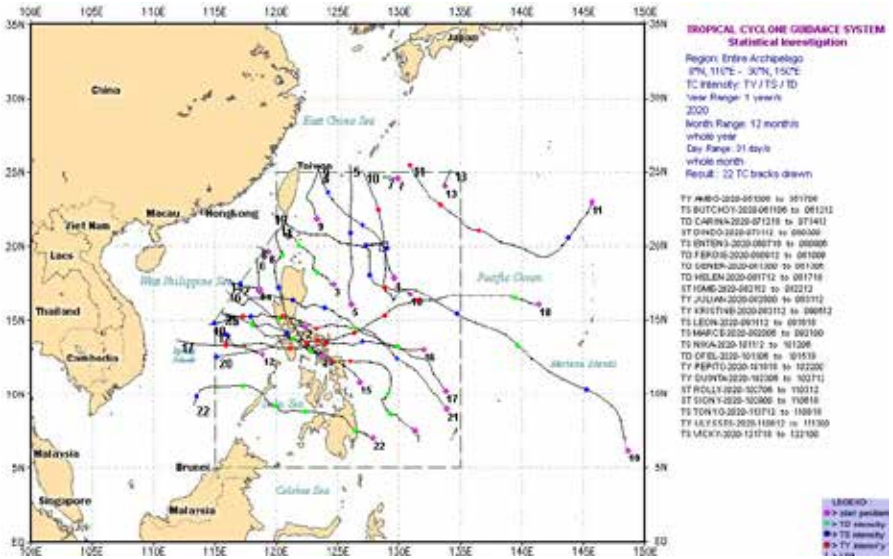
10
Non-technical in-house training courses

Weather And Climate Monitoring, Forecasting And Warning Program

Delivery of Accurate Forecasts/Warnings

Every year, different characteristics and strengths of Tropical Cyclones (TCs) are monitored by PAGASA to provide quality weather forecasts. These forecasts are crucial to planning and decision making to carry out steps necessary in ensuring the safety of the affected community.

A testimony of commitment to public service was proven by PAGASA when a remarkable average of 51.2 kms forecast track error for Typhoon and 62.4 kms for Tropical Storm at a 24-hour lead time was recorded in 2020. This means that the margin of error was minimized as compared to the actual TC tracks amidst strong typhoons that hit the country. Moreover, 100% timely issuance of weather and TC warnings within 15 minutes of scheduled time were provided to clients and stakeholders.



Maximizing Information Dissemination through Social Media

Social media platforms as one of the fastest and effective communication tools, were utilized by PAGASA to efficiently transmit timely weather and climate information safely to beneficiaries respective homes, considering the community quarantines imposed due to COVID-19.

The trust built by PAGASA over the years has made its official Facebook page reached 4,141,758 likes and 4,393,860 followers, 6.26 million followers on Twitter, and 406,309 subscribers on Youtube.

These numbers are not just statistics, but a proof of accomplishment as it shows the response and confidence of the people to the products and services of the Agency.

Dissemination of Climate-Related Information

Various climate focal organizations/committees received and were continuously briefed by PAGASA with climate-related information. Despite COVID-19 ceased the normal activity of the people, PAGASA has sustained providing the updates and information on climate to various climate focal organizations/committees through the conduct of climate outlook forums in different scopes: 11 Provincial Climate Forums; 2 Regional Climate Outlook Forums (ASEANCOF); 12 Local Climate Forums.

FLOOD MONITORING, FORECASTING AND WARNING PROGRAM

Establishment of Flood Forecasting and Warning System

The establishment of Flood Forecasting and Warning System (FFWS) across the country has been the priority of the Agency since it started in the 90s. The aim of this action is to address the growing need of the nation to receive advance flood information and warnings knowing that the country is susceptible to inundations.

It is with pride that PAGASA has established FFWS in 13 major river basins such as in Pampanga, Agno, Bicol, Cagayan, Pasig-Marikina, Jalaur, Tagum-Libuganon, Cagayan de Oro, Abra, Davao, Buayan-Malungon, Tagoloan, and Panay. The monitoring and communication facilities in a river center will lead to provision of adequate, up-to-date, and timely flood information.

RESEARCH AND DEVELOPMENT PROGRAM FOR WEATHER AND ALLIED SCIENCES

Completed PAGASA Research and Development Projects

Multi-temporal and Extremes Analysis of Modeled Climatology over the Philippines in the SEA CORDEX Domain

Changes in climate can now be simulated with the advancement of technology using global or regional climate models. However, proper representation of important atmospheric variables such as temperature, precipitation, etc. remains a challenge. Proper model set up and configuration must be ensured to produce climate projections.

The Multi-temporal and Extremes Analysis of Modeled Climatology over the Philippines in the Southeast Asia Regional Climate Downscaling/Coordinated Regional Climate Downscaling Experiment South East Asia (SEACLID/CORDEX SEA) Domain project is a collaboration between Manila Observatory and PAGASA, funded by the DOST-PCIEERD. The project was conceptualized to assess the capability of the SEACLID/CORDEX SEA modeled results in capturing the multi-temporal change, variability, and extremes in the Philippines.

The project was completed in 2020 and accomplished the CORDEX Extremes for review, continued the Climate Extremes Risk Analysis Matrix for the Extremes Report and created modules for Climate Extremes Report.

Analysis of the Influence of Sea Surface Temperature Representation in Downscaled Regional Climate Using the SEACLID/CORDEX-Southeast Asia Simulations

Climate variability over Southeast Asia is affected by variability in sea surface temperatures (SST). However, the spatial pattern and temporal variability of SST and its influence on regional climate may not be well represented in climate models, especially if the atmosphere is uncoupled from the ocean, which results to biases in the downscaled climate output. Lately, simulations of near-recent climate over Southeast Asia have been generated from the SEACLID/CORDEX-SEA project. The comparison of observed data indicates model biases in the simulation of temperature and rainfall over the region. Thus, it is important to examine the representation of SST in climate models in order to address uncertainties.

The result of this project between Manila Observatory and PAGASA, provides a deeper understanding on the SST-climate relationship over Southeast Asia, particularly in the Philippines, to improve the regional climate simulations to create better future climate projections that can be used in adaptation and impact studies.

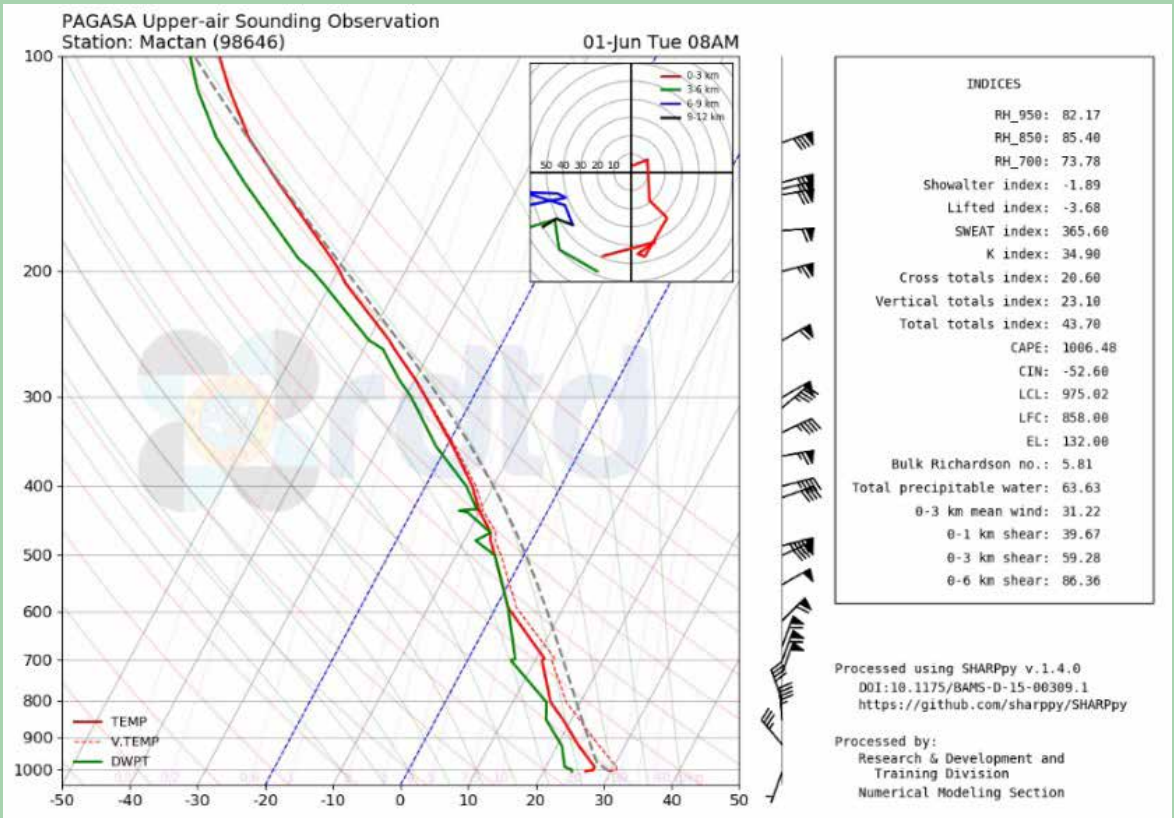
The project was completed in 2020 which produced the draft manuscript of the paper entitled "relationship of climate indices and SST variability in the Philippines".

Detecting Tropical Cyclones in a Downscaled Regional Climate Model CORDEX-SEA

No studies yet focus on the potential changes in Tropical Cyclone (TC) characteristics in the Southeast Asia, especially in the Philippines. Although there are significant advancements in regional downscaling of reanalysis and project climate data, the prediction of the intensity and structural aspects of TC climatology especially in Southeast Asia still has to be developed. Thus, analysis on how regional climate models are able to capture and simulate TCs, given the potential implications of changing TC characteristics, including the possible increase in the intensity due to climate change is significantly important.

This project was formed to contribute to the improvement of regional climate models (RCMs) in detecting the historical and future TC activity in the SEA region, particularly within the Western North Pacific (WNP) basin.

This collaborative project between Manila Observatory and PAGASA was completed in 2020 having accomplished the conduct of sensitivity experiments to convective parameterization schemes, compared the RegCM4-simulated tropical cyclone-like vortices (TCLVs) with the Japan Meteorological Agency (JMA) best-track data and submitted the "Sensitivity of Tropical Cyclones to Convective Parameterization Schemes in RegCM4" to the Climate Dynamics.



A Dispersive Long-Wave Model for Predicting Coastal Flooding due to Storm Surges and Surface Waves in Manila Bay

Storm surge phenomenon normally occur during the passage of a typhoon and is a result of complex interaction of the physical oceanographic and meteorological conditions that prevail over shallow coastal areas. Storm surge has been documented in Manila Bay due to its vast and shallow bathymetry, thus a major storm surge in the said area could be devastating. Accurate storm surge forecasting is a crucial factor to mitigate loss of lives learning from the experience during Typhoon Yolanda.

This study, completed in March 2020, aimed to produce a reliable storm surge forecasting tool to determine the potential coastal flooding due to storm surge and wind-driven waves in Manila Bay.

The project developed a new dispersive storm surge model and was applied in Manila Bay. The effects of typhoon wind-stress and surface waves were included in the new model which can simulate simultaneously, the total water level due to tides + storm surge = surface waves. Also, the project submitted a paper and was published on Journal of Ocean Technology.

Operationalization of SHARPpy – Sounding and Hodograph Analysis Research Program in Python

This project is a collaboration between atmospheric scientists and meteorology students in the University of Oklahoma. They used an old sounding analysis program, which was formulated and tested at the National Oceanographic and Atmospheric Administration (NOAA) Storm Prediction Center (SPC). The program was translated into a modern programming language, released through an open-source framework to encourage further improvement. The major objective of this open-source software is to standardize sounding analysis for a variety of users in the atmospheric science community.

SHARPpy helps Rainfall Warning System (RWS) forecasters to produce sounding analysis based from the observed and forecast data. The tool will provide easiness in generating sounding indices, thus, forecasters are assisted in diagnosing deep and moist convection associated with convective scale systems.

SHARPpy was adapted using observed and Weather Research and Forecasting Model (WRF) forecast data, verified and validated the outputs and introduced the tool to RWS. It became operational and is used to provide sounding analysis during TC occurrences as part of the weather assessment that the Numerical Modeling Section (NMS) provides to the Impact-Based Forecasting team.

New Research and Development Projects

Flood Risk Assessment for Pilot Flood-prone Area in the Province of Isabela

Isabela is one of the provinces in Cagayan Valley that mostly experience flooding due to its geographic location, topography and anthropogenic factors. Existing studies and tools such as flood hazard maps were developed for the province but only a few of them focused on the assessment of flood risk in the flood-prone areas of Isabela.

This study is a two-year project which started in 2020, to develop a method that can be used to assess the elements of flood risk in one of the flood-prone cities/municipalities of Isabela. The project also aims to develop flood hazard and risk maps with 10, 25, 50- and 100-year return periods that can be used by disaster leaders, managers and policy makers in dealing with the future events in the area.

Physical Resources And Operational Techniques Program

C-Band & S-Band Doppler Weather Radars

Doppler weather radars have been the face of PAGASA. They are efficiently reliant weather equipment as they are not just used to provide information on the movement and intensity of a TC but they are also used to monitor short-lived weather systems such as thunderstorms.

The establishment of Doppler Weather Radars in Agno, Laoang, and Masbate is still ongoing in 2020. They will complete the 20 Doppler weather radar stations of PAGASA.

X-Band Radars (Stationary)

X-Band Radars are effectively a good tandem with gauged hydrological stations as they provide information for the provision of warnings on flood and flashfloods. PAGASA is establishing these stations in Cagayan (Echague, Isabela), Agusan (Esperanza, Agusan del Sur), Tagum-Libuganon (Panabo, Davao del Norte), Mindanao (Kabacan, North Cotabato), Ilog-Hilabangan (Kabankalan, Negros Oriental), Panay (Cuartero, Capiz), and Davao (Davao City).

Establishment of Weather Stations

Field weather stations are the house of basic weather instruments and other modern weather equipment. This is where observations are recorded/gathered before transmitting to the Central Office.

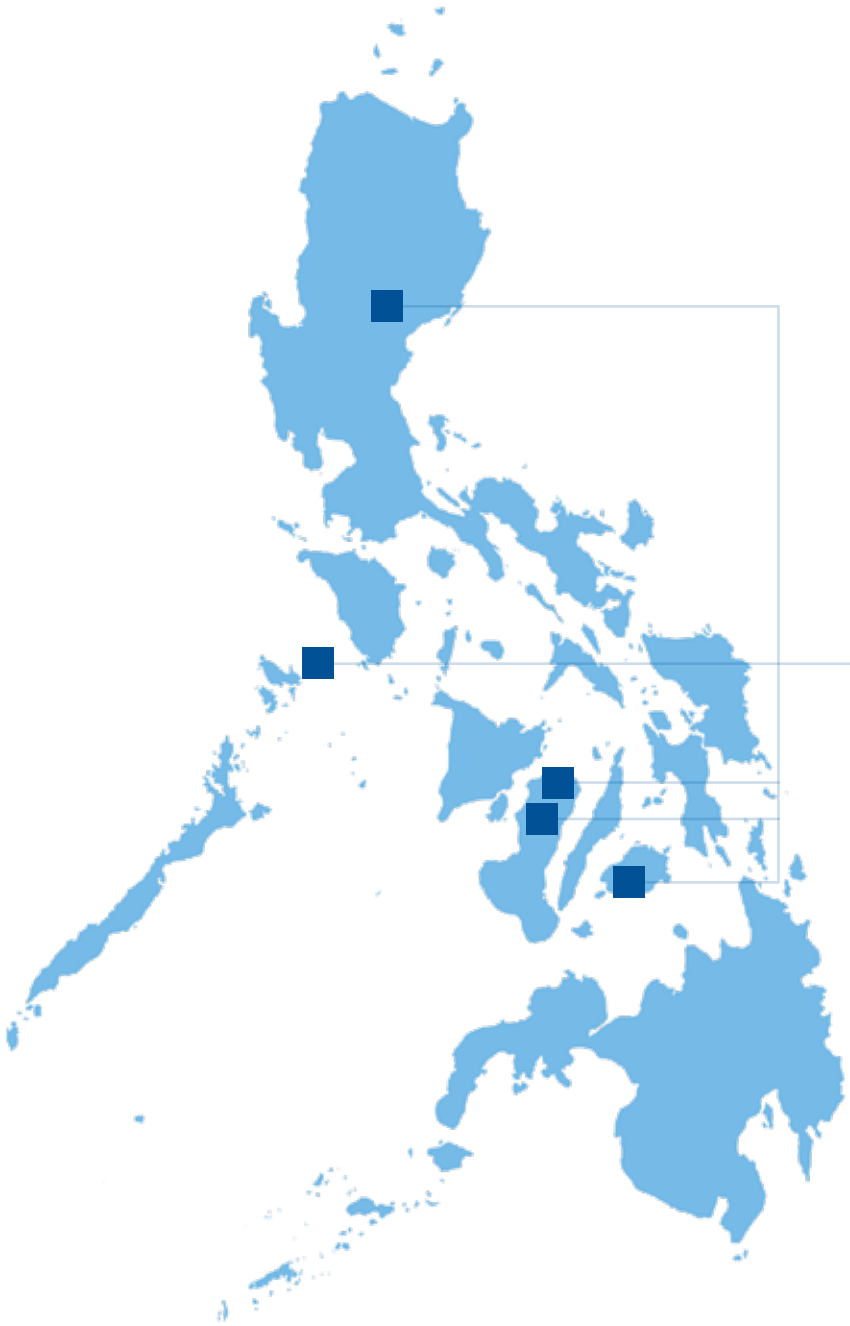
PAGASA completed the construction of two field weather stations in Bataan and Camiguin.

Camiguin

Bataan

Establishment of the PAGASA Data Center

The Agency has completed the establishment of Data Center beside the Central Office in Quezon City. Another one is being established in Mactan (Cebu) that will serve as the Agency's disaster recovery facility.



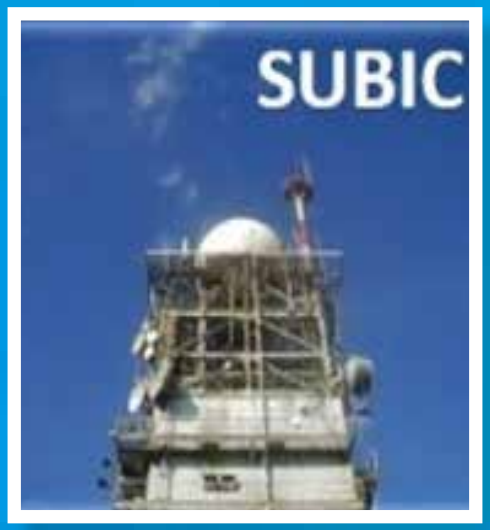
High-Frequency Radars (HFRs)

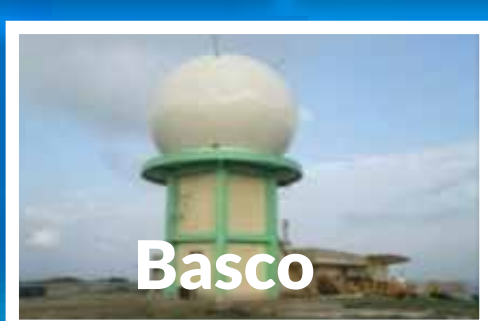
High frequency (HF) radar has become a vital tool to remotely map the spatial distribution and time-based development of waves and currents of the nearshore coastal ocean. It has become a suitable land-based platform facility that provides data/information about sea state conditions like significant wave height, current direction, and current velocity. The accuracy of the observation of HFRs are comparable to those in situ buoy measurements. Nowadays, more countries are adopting this technology, especially in the Southeast Asian region, because of the hazards that tsunamis and storm surges pose to people's lives living in coastal areas.

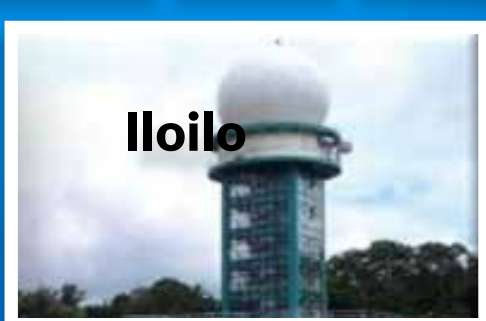
PAGASA have completed 5 five more HFRs in Anda (Bohol), Magsaysay (Misamis Oriental), Malimono (Surigao del Norte), Dinapigue (Isabela) and Dipaculao (Aurora).

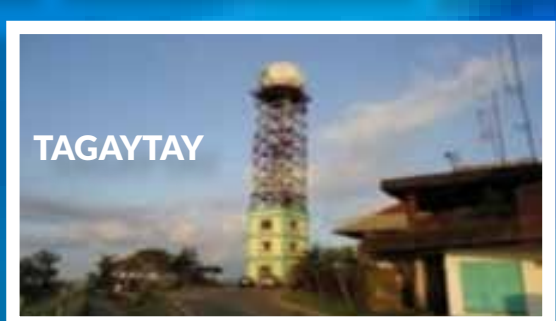
Moreover, the establishment of HFRs in Daan Bantayan (Cebu) – Catmon (Cebu), Danao (Cebu) – Camotes Island (Cebu) and in Placer (Masbate) – Cadiz (Negros) – Madridejos (Cebu) is ongoing.

Doppler Radar









CLIMATE CHANGE ADAPTATION, DISASTER PREPAREDNESS AND RISK REDUCTION PROGRAM

Thriving IECs in the Digital Platform

IEC aims to reinforce the dissemination of various hydro-meteorological information and its accompanying hazards, impacts, risks, and vulnerabilities. It aids in the proper understanding and interpretation of said information and enables decision-makers, media, other users, and the general public to act accordingly.

PAGASA carried out the observance of the Typhoon and Flood Awareness Week (TFAW) on 21-27 June 2020 with this year's theme: "Handa sa Tag-ulan, Iwas Sakit at Sakuna." The said activity emphasized how disaster preparedness and scientific knowledge contribute to ensuring the safety, well-being, and economic security of people and the environment against man-made and natural hazards such as those brought by the rainy season. Especially nowadays, the Coronavirus-19 (CoVid-19) threats continue affecting the country.

In compliance with the guidelines of the Inter Agency Task Force on Emerging Infectious Diseases (IATF-EID), PAGASA maximized online platforms to conduct information, education, and communication (IEC) campaigns. Webinars, trivia, and other interactive activities are posted on PAGASA's official Facebook event page Typhoon and Flood Awareness Week (@tfaw.dostpagasa).

Also, the agency organized and conducted a Climate Outlook Forum on 24 June 2020 and an open-to-public webinar on DOST-PAGASA 24/7 Operations on New Normal.

Typhoon and Flood Awareness Week

Typhoon and Flood Awareness Week (TFAW) 2020 was conducted from 21 to 27 June with a new normal setup. This year's theme is "Handa sa Tag-ulan, Iwas Sakit at Sakuna".

This year's main goal is to highlight how disaster preparedness and scientific knowledge can be effective to ensure the safety, well-being and economic security of people and environment in human-made and natural hazards, while the coronavirus disease continues to affect many Filipinos. In addition, June is also the beginning of the "typhoon season" in which most tropical cyclones developed in the Philippine Area of Responsibility (PAR) impose threat to the country.

During the one-week celebration of TFAW, two major activities were conducted through webinars, hosted in Zoom and streamed via Facebook Live.

PAGASA organized a webinar which is open to public on 26 June 2020 regarding the Agency's 24/7 Operations on New Normal. It focused on the continuous service of the agency despite the imposition of community quarantines and lockdowns. It also features how PAGASA personnel follows strict health protocols to prevent contracting the deadly virus.

The said activity was attended by various participants from Department of Science and Technology (DOST) attached agencies, Department of Education (DepEd), Department of Interior and Local Government (DILG), Girl Scouts of the Philippines (GSP), and participants from different State Universities and Colleges (SUCs), elementary and secondary schools.

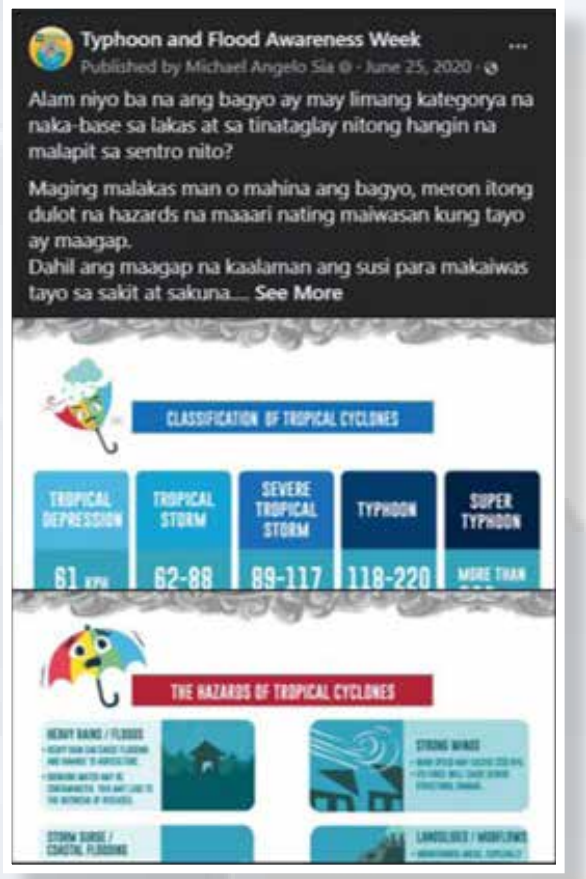
A total of 126 participants registered in the said webinar but around 600 viewed the Facebook Live. 67% of them were members of the academe, who expressed the necessity to be familiar with the products and services of the Agency. This feedback was gathered from the post-activity evaluation.

The live Facebook upload reached an estimated 13,500 audience nationwide. It also made 2,500 engagements because the video was seen by large group of people through their news feed from the post /video sharers. It garnered a total of 319 reactions, 149 comments, 51 shares and received no negative feedback from the audience.

The other activity held during TFAW is the Climate Outlook Forum for media partners. This was organized in partnership with the Climate Monitoring and Prediction Section.

Over the week, the Public Information Unit (PIU) maximized the use of Facebook to give its page followers refresher topics and trivias in a form of info graphs such as Classification of Tropical Cyclones from Tropical Depression to Super Typhoon and the preemptive measures during TC Wind Signals 1-5.

Please refer to TFAW FB Page here: https://www.facebook.com/tfaw.dostpagasa



TFAW is observed every third week of June by virtue of Proclamation no. 1535, signed in 2008. PAGASA conducts prevention and mitigation awareness through public information dissemination campaigns to educate the public and promote information on hazards of tropical cyclones and flood, together with Philippine Science Journalists Association, Inc. (PSciJourn), TCFI, other government agencies and the private sector.

Provincial Climate forum

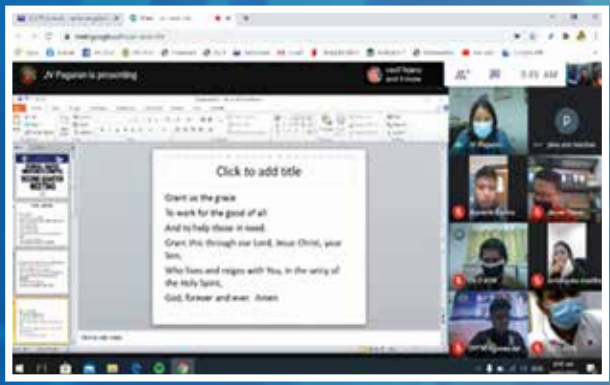
On March 5-6, 2020, before the nationwide lockdown was imposed, PAGASA held its provincial climate forum in Legazpi, Albay.

The forum served as an avenue to give updates on weather, status of Philippine climate, PAGASA's current early warning capabilities and to make the participants recognize the need for precise knowledge on hydrometeorological hazards, including El Niño and their consequences, It also aims to communicate climate information and useful forecast to diverse users and decision makers in order to build the capacity of professionals at the local level to use weather and climate information in decision-making related to agriculture, water resource management, public health and disaster management, appropriately. Significantly, it provides guidance in the formulation of LGU Contingency Plan for El Niño pursuant to Memorandum Order No. 38, s. of 2019 (Reactivating and Reconstituting the El Nino Task Force).

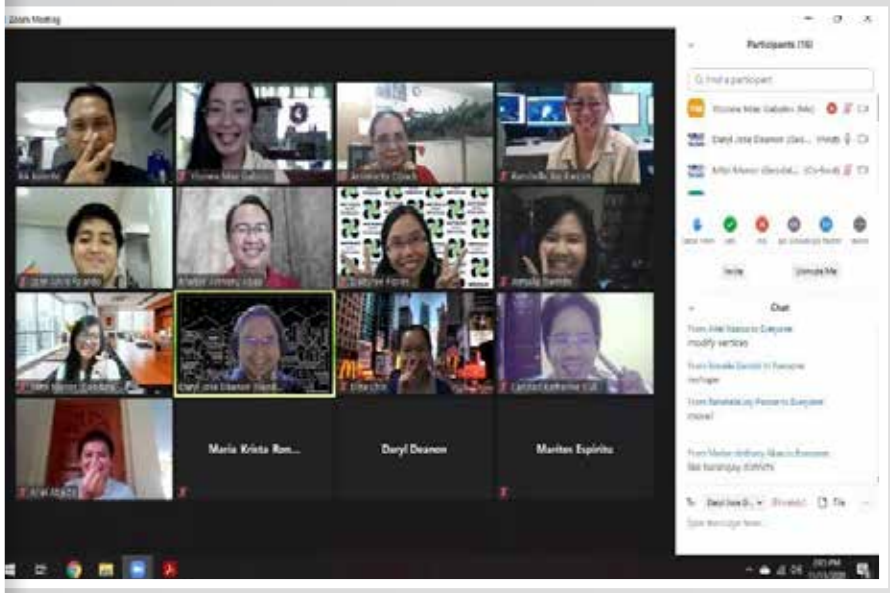

TOGETHER, WE ARE STRONGER!!!!
ETHER, EVERYONE ACHIEVES


DOST-PAGASA - HIMAWARI ENHANCED INFRARED


PDRRMC ISABELA
RD QUARTER REGULAR
BUSINESS MEETING


Click to add title
Grant us the grace
To work for the good of all
And to help those in need.
Grant this through our Lord, Jesus Christ, your
Son,
Who lives and reigns with You, in the unity of
the Holy Spirit,
God, forever and ever. Amen


PROVINCIAL DISASTER
PREPAREDNESS COMMITTEE
SECOND QUARTER
MEETING



ArcGIS Pro Training

Representatives from different offices of PAGASA particularly from CAD, WD, PRSDs and ETSD attended the ArcGIS Pro training to capacitate them on mapping and visualization skills for the enhancement of weather and climate products.

The series of the ArcGIS Pro Trainings were conducted from September to December 2020.

Agriculture and farming are primarily reliant on seasons and weather. Now that the technology is advanced and special weather forecasting mechanisms are presented on trainings, dissemination of information is made easier especially with the use of smartphones in this time of pandemic.

Webinar on PAGASA Agrometeorological Products and Services

13 November 2020, 9:00am via Zoom

Webinar on PAGASA Agrometeorological Products and Services for the Department of Agriculture- Agricultural Training Institute (DA-ATI) Personnel.

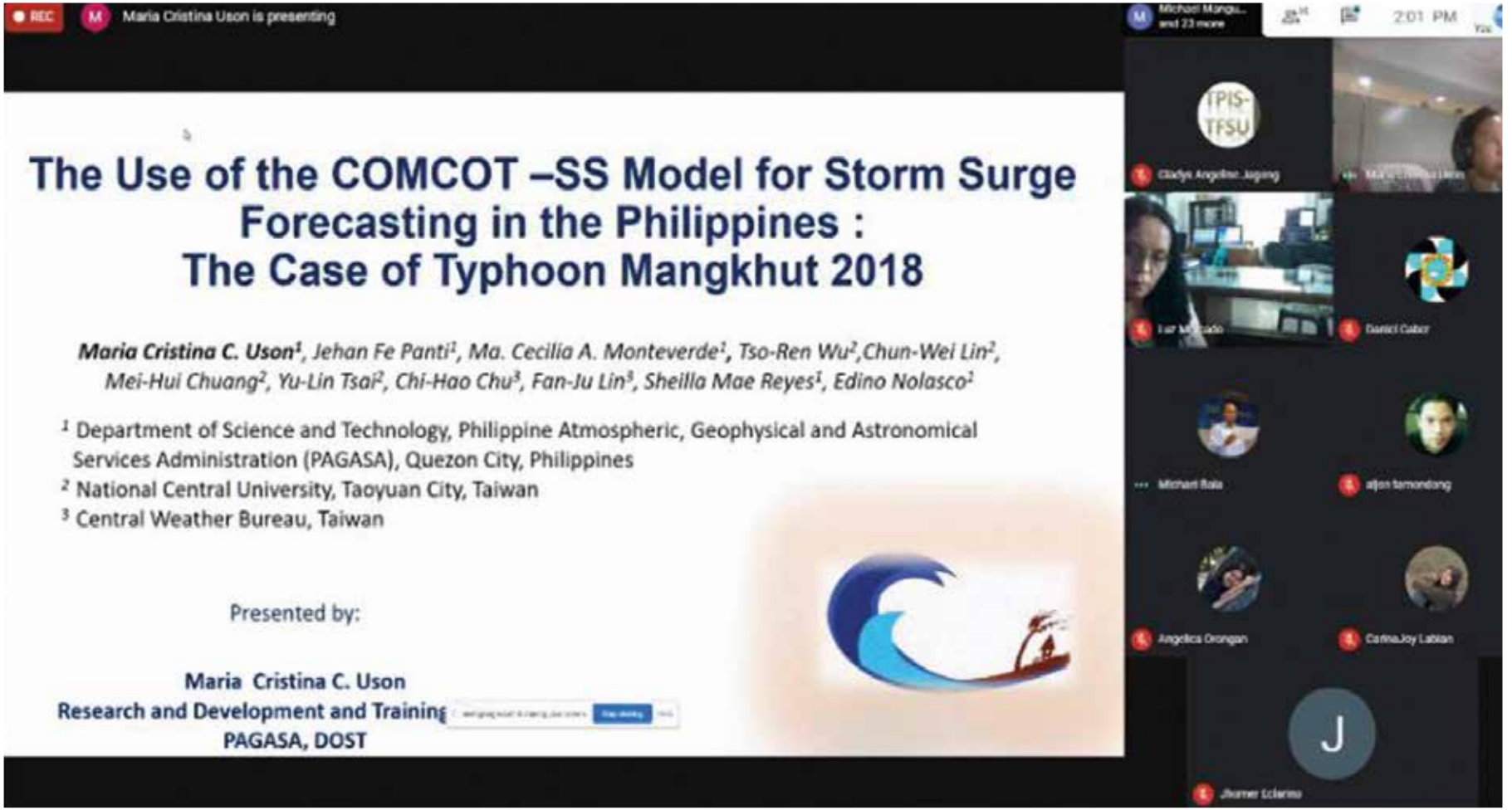
Webinar on PAGASA Agrometeorological Products and Services

13 November 2020, 9:00am via Zoom

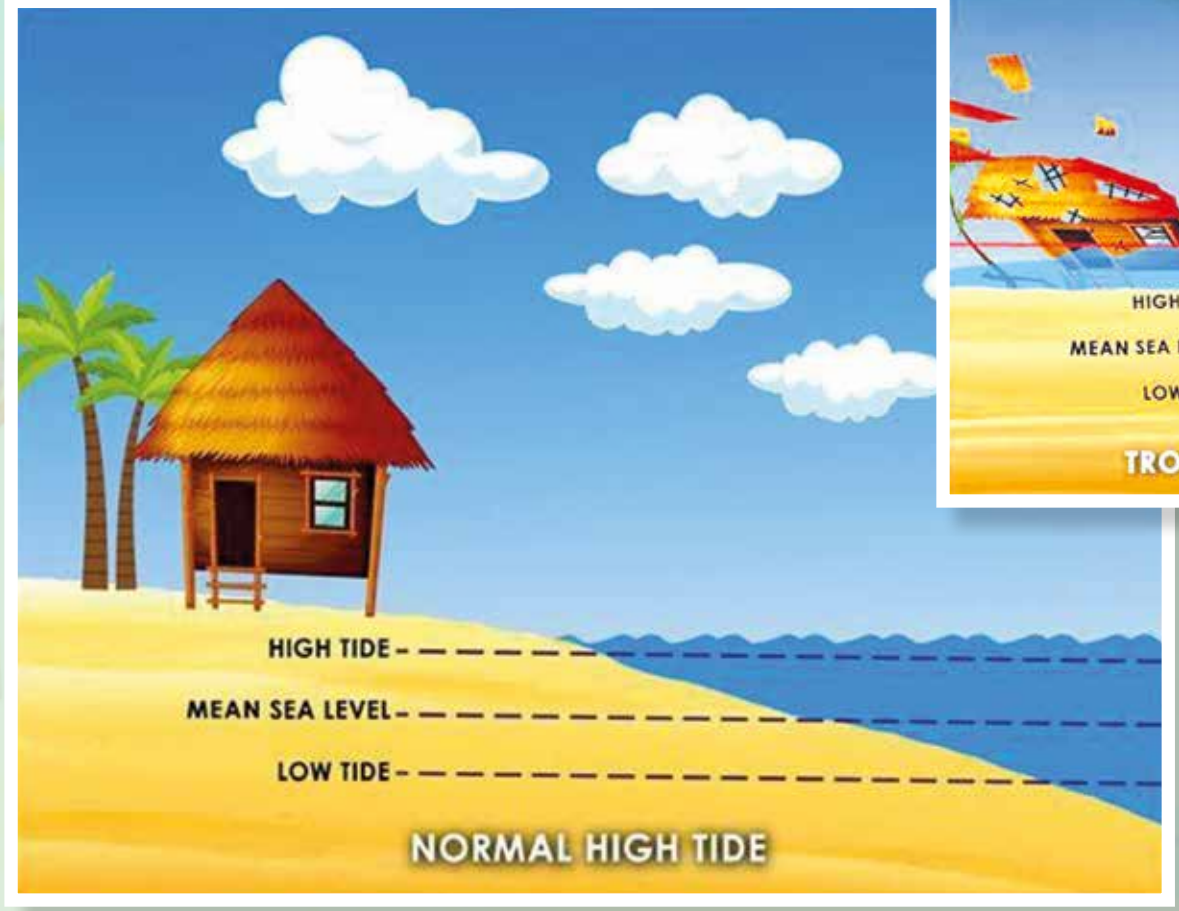
COMCOT

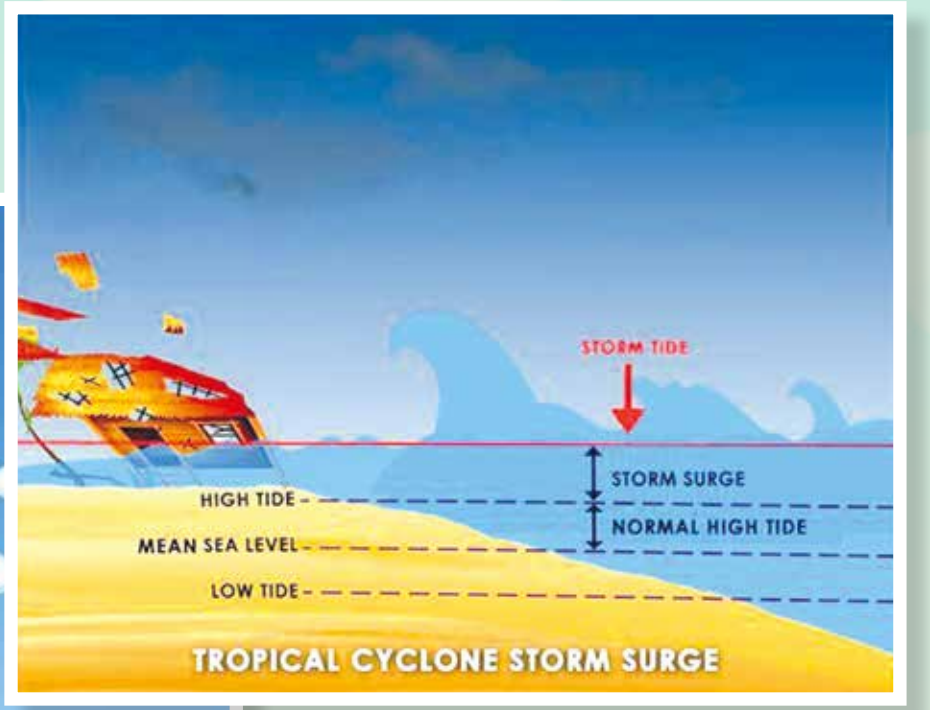
Storm surge (Also known as "Daluyong ng Bagyo") is the abnormal rise in sea level that occurs during tropical cyclones or "bagyo". It is caused by strong winds and low atmospheric pressures produced by tropical cyclones. As the tropical cyclone approaches the coast, strong winds push the ocean water over the low-lying coastal areas, which can lead to flooding. This makes storm surges very dangerous. *(http://bagong.pagasa.dost.gov.ph/information/storm-surge)*

On December 16, 2020, the Research and Development and Training Division (RDTD) of PAGASA initiated the training on Cornell Multi-grid Coupled Tsunami (COMCOT) Model—a tool used to study the storm surge. Participants understood the function of some basic tools used in formulation storm surge and tsunami model and its criteria. Thus, they gained partial ideas on how it run in different location of driving force



Basic Training for Cornell Multi-grid Coupled Tsunami (COMCOT) Model





Trainings & Seminars

Empowering the Next Generation

With constant efforts to value and shape the minds of the future generation, PAGASA provided a lecture to the visiting Engineering students of the Laguna State Polytechnic University (LSPU) to familiarize them with the different types and uses of weather instruments



Lectured the visiting Students of LSPU Sta. Cruz, Laguna


PAGASA lectured the visiting Electronic Communication Engineering Students of Universidad De Manila, to familiarize them on the different types and uses of weather instruments at PAGASA Baguio Complex Station on January 15, 2020

Lectured the visiting Electronic Communication Engineering Students of St. Joseph's Institute of Technology

Lectured the visiting Electronic Communication Students of Caraga State University

Pushing Towards a Disaster Resilient Biliran Province

PAGASA, in collaboration with the local government of Biliran, conducted a three-part, one-day activity at the Biliran Provincial Government Center in Naval, Biliran on 27 January 2020.

The said three-part activity is mainly to provide a technical guidance on flood risk reduction and management for local officials, disaster managers, responders and other stakeholders in the LGUs of Biliran. it will give them a clearer interpretation and understanding on hydro-meteorological hazards that affects their province. It will also help them to appreciate the weather and flood disaster management initiatives of the national government.

Alongside the IEC is the highlight of the event which is the groundbreaking ceremony for the establishment of the PAGASA-Biliran Synoptic Station and the signing of Usufruct Agreement between Biliran's Governor Espina and PAGASA's Administrator, Dr. Malano. This joint initiative will strengthen the Local Disaster Risk Reduction Management of the said province.

Weathering with yoUP HIGH

Disaster Readiness and Risk Reduction is integrated in the K-12 curriculum nowadays.

This has been the motivation of PAGASA, particularly the Visayas PAGASA Regional Services Division personnel, when they conducted an IEC campaign on hydrometeorological hazards and preparedness in collaboration with the UP High School.

The said activity was held on 25 November 2020 via Zoom.

DOST-PAGASA joins FEU High School as it celebrates Academic Week 2020

Far Eastern University High School (FEU-HS) invited PAGASA in its Academic Week 2020 bearing the theme "Scientia vincere tenebras: The Celebration of Human Experience through Scientific Literacy" on January 16-17, 2020 in FEU Manila to discuss the Agency's products and services.

The Academic Week 2020 aimed to expose the high school students, also called "Baby Tamaraws", on how Science has contributed to technology innovations. Several activities were set-up to improve the students' literacy in Science, particularly the first-hand experience on technological advancements, breakthroughs in the field of engineering and mathematical intricacies.

FEU-HS Science, Technology, Mathematics, and Engineering (STEM) strand, hosted the Academic Week to instill the specialized Science and Mathematics concepts, integrated with technology in student's knowledge.

DOST-PAGASA showcased its interactive exhibits in FEU-HS building which catered a total of 1,380 STEM Baby Tamaraws (808 Female 808 & 572 Male 572).

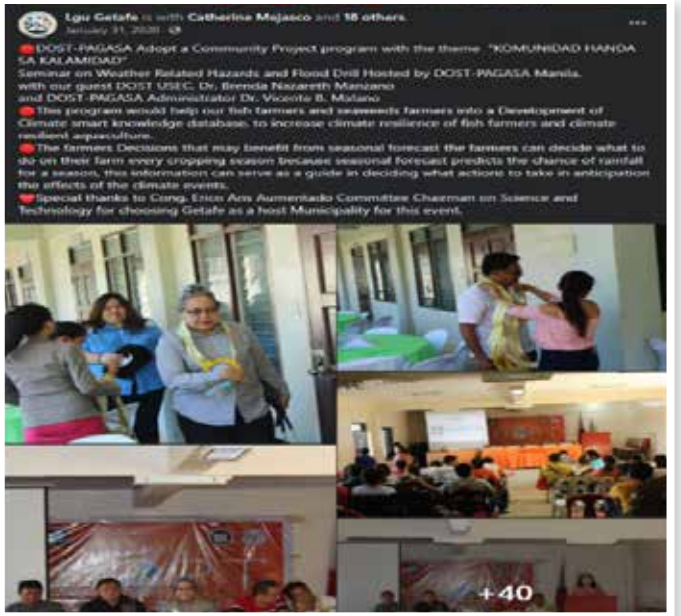
STEM Faculty Mr. Kervin Alcantara, Jr. commended the efforts done by PAGASA, during the celebration of their Academic Week 2020, creating an avenue of possible collaborations with the state weather bureau.

When in Bohol: A Community Disaster Preparedness Forum and Drill

In compliance to the directive of the DOST Secretary Fortunato de la Peña, PAGASA was tasked to choose its preferred location in Region VII. With the assistance of the Committee on Science and Technology Chair Erico Aristotle Aumentado and Committee Secretary Donald Amado Caballero, Getafe, Bohol was chosen due to its experience on exposure to weather-related hazards.

IEC was conducted in the Municipality of Getafe on day one in coordination with Mayor Casey Shaun Camacho through their DRRM Office. 96 residents coming from 24 barangays in Getafe participated the said IEC. On the following day, a strom surge drill in Campao Occidental was conducted in coordination with their Barangay Chairman Jornel Eviota. 282 people joined the drill including some senior citizens and minors.

The Municipality of Getafe expressed their gratitude to PAGASA through their official page.



Flood EWS Featured in the 5th National R&D Conference

The 5th National Research and Development Conference (NRDC) headed by the Department of Science and Technology (DOST) was utilized by PAGASA to feature the advancements of Flood Forecasting and Warning System for Pasig-Marikina River Basin. This was held on November 10 2020, streamed through DOST NRDC Facebook page

PAGASA highlighted the innovations of Flood Early Warning System (FEWS) strategically located in Pasig-Marikina River Basin.

Engr. Badilla represented PAGASA during the NRDC explaining the importance of FEWS in the flood forecasting, specifically in Metro Manila.

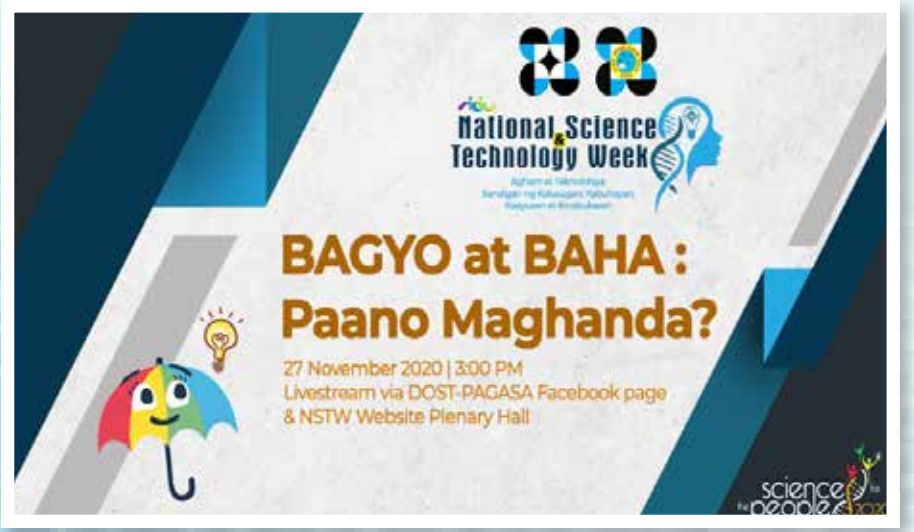
"With the enhancement of the Flood Forecasting Warning System for Pasig-Marikina River Basin, PAGASA is now well-armed to warn people living nearby the Pasig-Marikina and Tullahan Rivers. The installation of these hydrological monitoring stations ensure that every water droplet is monitored and accounted for," Engr. Badilla said in his presentation.

DOST-PAGASA joins virtual NSTW 2020 Celebration

The first virtual National Science and Technology Week (NSTW) was held on November 23-29 2020, with a theme "Agham at Teknolohiya: Sandigan ng Kalusugan, Kabuhayan, Kaayusan, at Kinabukasan". The Department of Science and Technology (DOST) and the Office of the Undersecretary for Scientific and Technical Services spearheaded the event and PAGASA conducted a webinar on Disaster Risk Reduction tips for kids.

A short webinar with a title "Bagyo at Baha: Paano ba Maghanda?" was organized by PAGASA to teach children and parents to prepare for tropical cyclones.This was presented through a discussion on basic hydrometeorological terminologies and familiarization on the hazards brought by these weather-related phenomena.

Experiment on how clouds are formed and the emphasis on the importance of preparation for the impending hazards during a Tropical Cyclone were featured including several examples and causes of flooding, as well as the Flood Early Warning System and the flood safety precautionary measures.



Year-end report with media wraps up 2020

This year, PAGASA conducted the year-end report with the media virtually, by presenting them the Agency's accomplishment and thanksgiving report.

Spearheaded by the Public Information Unit (PIU) Chief Venus Valdemoro, PAGASA closed the year with a rundown of technological upgrades, innovations, as well as other activities and virtual interaction with the public—essentially, how the state weather bureau continued to work amidst the threats of the coronavirus (COVID-19).

"PAGASA's performance this 2020 is something I am proud of. Whether we are talking of their forecast which has been in general very accurate, their research and development work has made new knowledge contributions not only for our benefit, but also for the whole sector and of course we have seen the improvement in infrastructure, facilities that are installed, all consistent with the PAGASA Modernization vision" DOST Secretary Fortunato T. de la Peña said in his year-end message.

Connecting through Media

HUMAN RESOURCE DEVELOPMENT PROGRAM (HRDP)

Exec Staff, Technical Personnel Undergone Broadcasters' Training for Better Media Relations

PAGASA, conducted a Basic Broadcasting Seminar-Workshop for the agency's executive staff and technical personnel who regularly engage with media to improve their communications skills and media relations from February 29-March 1, 2020 in Antipolo, Rizal

The event was made possible though the Agency's partnership with the GMA News and Public Affairs. The training aims to familiarize PAGASA personnel on basic broadcasting skills and trends; improve their speech delivery skills in terms of broadcasting and on-cam interviews; and understand how media works.

Some of the GMA reporters who presented are:

- **Antonio Magsumbol,** Senior Program Manager & Head of IMReady, presented on **Basic Speech**
- **Mariz Umali,** GMA News Reporter, **Tone Color & Semantic Expressions**
- **Nathaniel "Mang Tani" Cruz**, GMA Resident Meteorologist and former PAGASA Weather Division Chief, **Simplification of PAGASA Information & Warning Messages**
- **Ivan Mayrina**, GMA News Reporter, **Broadcasting for TV**
- **Alwyn Alburo,** Executive Producer of IMReady and Balitangtanghali, **Understanding how Media Work**

Technical Training for the Full Upgrading of Mactan C-Band Doppler Weather Radar System

On-site hardware training and EDGE 6 software training was conducted on January 17 to February 14 2020 for the full upgrading of the Mactan C-Band Doppler Weather Radar System

Training and Site Acceptance Test of Automated Weather Observing System at Tacloban Airport Station

During the installation of the AWOS at the Tacloban Airport Station, training and site acceptance test was conducted on September 22 to October 15 and on October 20-23, 2020. The system will provide continuous, real-time information and report on airport weather condition.

List of *Graduates*

"The capacity to learn is a gift; The ability to learn is a skill; The willingness to learn is a choice." - Brian Herbert

PAGASA acknowledge the perseverance of PAGASA employees who pursue higher education to improve themselves as individual and as government servants.

This achievement is a testimony of the Agency's healthy collaboration with local and international scholarship organization.

Name: John Mark I. Dolendo
Master of Science in Atmospheric and Environmental Science
Hankuk University of Foreign Studies (HUFS)
Republic of Korea
Date of Graduation: August 21, 2020

Name: Shelly Jo I. Ignacio
Master of Science major in Meteorology
Date Covered: Sept 2018 - July 2020
Nanjing University of Information Science and Technology
Date of Graduation: June 20, 2020

Name: Ma. Luisa R. Salvatierra
Master in Communication Major in Social Communication
Date Covered: Aug. 2017-Dec. 2019
St. Paul University Manila
Date of Graduation: May 28, 2020

List of Technical Courses

Conducted/Attended

- **ISO Awareness Seminar for PAGASA Technical Personnel**
  03 to 04 February 2020

- **Technical Writing Workshop**
  05 to 07 February 2020

- **Training on Dispersive Long-Wave Model for Predicting Coastal Flooding due to Storm Surge and Surface Waves in Manila Bay**
  10 to 14 February 2020

- **NWP Post-processing Workshop**
  02 to 06 March 2020

- **Basic Radar Observation Coding and Maintenance Training**
  02 to 07 March 2020

- **Webinar on Utilization of Distance Learning in PAGASA Training Programs**
  25 to 27 and 29 May 2020

- **Seminar Workshop on Instructional Design in Distance Learning**
  1 to 4 September 2020

- **Meteorologist Training Course**
  21 September 2020 to 2021

- **Seminar on Operational River Basin Center Flood Forecasting and Warning Services under the New Normal**
  3 December 2020

List of Non-Technical Courses

Conducted/Attended

- **Strategic HR and Seminar cum Workshop on Employee Relations**
  18 February 2020
  PAGASA AO Conference Room

- **Health and Wellness Seminar**
  19 February 2020
  PAGASA Amihan Conference Room

- **PS-PhilGEPS Virtual Store Training and Working Towards Personal Effectiveness**
  26 February 2020
  PAGASA AO Conference Room

- **Virtual Training of Performance Management**
  7 to 8 September 2020
  Online

- **PIMME for the Submission of GPB 2021 and AR 2020**
  6 to 7 October 2020
  Online

- **PCW HGDG Webinar**
  13 October 2020
  Online

- **Orientation on Senior Citizen Laws**
  3 November 2020
  Online

- **DOST GAD Mainstreaming Awards Validation**
  19 November 2020
  Online

- **DOST GAD Webinar**
  26 October 2020
  Online

- **Coping with the New Normal: Managing Anxiety and Depression (Mental Health Webinar)**
  14 December 2020
  Online

List of International Meetings/ Conferences Attended

- **UND (Deeper Understanding of Natural Disaster – Instrumental for Disaster Mitigation) Project Meeting and Workshop**
  15 to 17 January 2020
  Malaysia

- **11th Regional Integrated Multi-Hazard Early Warning System (RIMES) Council Meeting in conjunction with the Celebration of the 10th Anniversary of RIMES**
  20 to 22 January 2020
  Thailand

List of International Trainings Attended

- **Integrated Precipitation Estimator using Radar and Satellite (IPERS) for Tropical Cyclone Rainfall (TC) Analysis and Nowcasting**
  13 January to 12 March 2020
  Hong Kong

2020 ONLINE DISTANCE LEARNING PROGRAMS

Participated by PAGASA

- **WMO Online Course on Education and Training Innovations**
  25 May to 31 July 2020

- **Distance Learning Course in Hydrology I: Basic Hydrological Sciences for Asian Countries**
  27 July to 11 September 2020

- **International Distance Training Course on the Installation and Maintenance of Meteorological Observing Instruments**
  3 to 14 August 2020

- **Public Service Values in Times of Adversities**
  11 to 27 August 2020

- **Webinar Series for NASA – Remote Sending of Coastal Eco Systems**
  25 August, 01 and 08 September 2020

- **KOICA-UNDRR Joint Fellowship Program, Disaster Risk Reduction for Sustainable Development (The Philippines)**
  21 to 28 September 2020

- **2020 CAP Implementation Workshop and the associated CAP Train the Trainers Session**
  28 to 30 September 2020

- **5th ArAS School for Astrophysics (ArAS SfA5)**
  16 to 23 October 2020

- **e-learning course on Essentials of Management 2020-2021**
  twenty-five weeks commencing on 12 October 2020

- **Training on Quality Control Techniques and Data Assimilation for Numerical Weather Prediction (The Philippines)**
  02 to 13 November 2020

- **Real-time Online Course on Weather Radar Utilization for Meteorological Services**
  16 to 27 November 2020

- **International Online Course on Upper Air (Radiosonde) Observing Systems**
  23 to 26 November 2020

- **Online Training Course on Weather Modification**
  30 November to 11 December 2020

- **BMKG Training Impact Based Forecast**
  7 to 9 December 2020

- **Online Training Desk on Severe Weather Forecasting Programme for Southeast Asia**
  7 to 9 December 2020

- **5th International Training Course on Typhoon Monitoring and Forecasting**
  9 to 11 December 2020

2020 ECHO SEMINARS

Participated by PAGASA

- **Integrated Precipitation Estimator Using Radar and Satellite (IPERS)**
  28 May 2020

- **Modern Weather Forecast Technologies**
  26 June 2020

- **Training Program on the Automation of Flood Early Warning System for Disaster Mitigation in Greater Metro Manila**
  10 July 2020

- **Typhoon Committee Research Fellowship Scheme for 2019**
  14 July 2020

- **11th International Training Workshop Climate Variability and Predictions in the NOAA-USAID Series**
  23 July 2020

- **Counterpart Training Program on Integrated Data Management of Flood Forecast and Warning System**
  05 August 2020

- **Training Program on Reinforcement of Meteorological Services**
  13 August 2020

- **Determination of Z-R Relationship for Radar-based Qualitative Precipitation Estimation using in-situ Measurements in Metro Manila**
  17 August 2020

- **WMO Severe Weather Forecasting Demonstration Project Southeast Asia (SWFDP-SeA) Regional Training Workshop on Severe Forecasting and Delivery of Warning Services**
  28 August 2020

- **Severe Weather Forecasting Demonstration Project – Southeast Asia Training Desk**
  09 September 2020

- **WMO/ASEAN Training Workshop on Weather Radar Data Quality and Standardization**
  14 September 2020

- **JMA/WMO Workshop on Quality Management Surface Observations – RA II WIGOS Project**
  22 September 2020

- **Typhoon Committee Research Fellowship Scheme for 2018**
  09 October 2020

- **VMWare Certification Training for the Project "Supply, Delivery, Installation, Testing, Training and Commissioning of One (1) Lot Hyperconverged Mirror Forecasting"**
  09 October 2020

- **Unified Model User Tutorial and Unified Model User Workshop**
  15 October 2020

- **Post-processing of Numerical Weather Prediction Outputs (The Philippines)**
  22 October 2020

- **Training Workshop on Asian Aviation Hazardous Weather Coordination**
  05 November 2020

- **Workshop on ENSO, MJO and associated extreme rainfall events in Maritime Continent and SCS**
  11 November 2020

- **Best Practices on Climate Change Projections and their Applications in ASEAN Countries**
  17 November 2020

- **Synergized Standard Operating Procedures (ISSOP) II – Attachment Training**
  25 November 2020

- **The IODE/OTGA-INCOIS Training Course: Data Visualization of Marine Meteorological Data using (FERRET)**
  04 December 2020

- **ASEAN Workshop on Weather Modification 2018**
  11 December 2020

- **Project 1: Typhoon Formation, Structure and Intensity Change in Western NP and Wave Observation Training Program**
  16 December 2020

- **Training Program on Reinforcement of Meteorological Services**
  22 December 2020

REGIONAL AND INTERNATIONAL COOPERATION PROGRAM

Action-Ready Climate Knowledge to Improve Disaster Risk Management of Smallholder Farmers in the Philippines (ACIAR Project)

With the valuable support of Australian Centre for International Agricultural Research (ACIAR) of the Government of Australia, and in cooperation with different Institutes and Universities, PAGASA reach out to our smallholder farmers to streamline the information pathway from the Agency to improve farm decision making for disaster risk management.

As these partnerships continues, the following significant outputs were made:

- Early version of the manual for the KlimAgrikultura Workshop
- a training workshop developed by the project collaborators to address the need of farmers and their consultants (e.g. AEWs and LFTs) for knowledge and skills in incorporating weather and climate information to farm-related decision making efficiently
- Submitted journal paper for the Philippine Agricultural Scientist Special Issue titled "From climate data to actionable climate knowledge: DOST-PAGASA experience providing climate services to smallholder farmers in Calapan, Oriental Mindoro"
- Drafted a policy brief for the project titled "Integration of Stallholder Farmers and Field Experts in Improving Climate Products and Services in the Philippines".
- Pre and Post pandemic, PAGASA through ACIAR and Project Collaborators accomplished the following activities in the year 2020.

Activity	Date	Participants
KlimAgrikultura Workshop in Baguio City, Benguet	13-19 Jan 2020	Local vegetable farmers, agricultural extension workers (AEWs) and local farmer technicians (LFTs) of the province
KlimAgrikultura Workshop in Calapan City, Oriental Mindoro	8-13 March 2020	
ACIAR Journal Writing Workshop for the Philippine Agricultural Scientists (PAS) Special Issue	June 2020	Project collaborators
Final Stakeholders Meeting on the Key Findings of the Action-Ready Climate Knowledge to Improve Disaster Risk Management of Smallholder Farmers in the Philippines	18 Nov 2020	Project stakeholders (i.e. NGAs and LGUs)
Terminal ACIAR Project Review	23-26 Nov 2020	Project collaborators

Rice farmers, Local Farmer Technicians (LFTs) and Agrikultural Extension Workers (AEWs), assisted by the ACIAR project team, are working on their activities during the KlimAgrikultura Workshop in Calapan, Oriental Mindoro on 8-13 March 2020.

Virtual conduct of the Final Stakeholders Meeting on the Key Findings of the Action-Ready Climate Knowledge to Improve Disaster Risk Management of Smallholder Farmers in the Philippines on 18 November 2020

Policy Dialogue on Weather-Related Disaster Resilience under Climate Change

The Policy Dialogue on water-related disaster resilience under Climate Change was conducted by the Asian Development Bank Institute (ADBI) together with the International Centre for Water Hazard and Risk Management under the auspices of UNESCO (ICHARM). This is to establish the linkage with the ADBI and among technical and financial experts in Asia and to promote water-related disaster resilience through the adoption of scientific evidences and tools in policymaking.

The two-day program which was held at the ADBI Headquarters in Tokyo Japan on 27-28 January 2020 is composed of keynote speeches, presentations and panel discussions particularly to facilitate a mid-level dialogue among Asian technical and financial experts emphasizing on the adoption of comprehensive governance, financing, and management frameworks to advance disaster risk reduction in Asia.

Mr. Socrates Paat from PAGASA's Hydrometeorology Division attended the said program.

GENERAL ADMINISTRATION AND SUPPORT PROGRAM

Mid-year Program Review and Analysis with Undersecretary Renato Solidum, Jr.

The mid-year performance review is conducted to assess the Agency's performance for the first semester and to identify actions needed further. It is a venue of productive conversation and exchange of ideas/perspectives that will address the challenges and issues serving as roadblocks in the accomplishment of goals.

On 20th of July, the Plans and Programs Development Unit (PPDU) of PAGASA hosted the 2020 Mid-Year Program Review and Analysis (PRA) via Zoom to assess noteworthy accomplishments of the programs and projects of each division under the 2018-2022 Strategic Plan. DOST Undersecretary Renato Solidum, Jr. together with some members of the executive staff, planning officers, attended the activity online while other concerned officers/personnel attended the activity at the PAGASA Amihan Conference Room to adhere with the minimum health standards set by Inter-Agency Task Force on Emerging Infectious Diseases (IATF).

PAGASA's effort to persistent Public Service through Public Service Continuity Plan

As part of the agencies under Disaster Risk Reduction and Management (DRRM), DOST-PAGASA, in cooperation with Office of Civil Defense Capacity Building and Training Service (OCD-CBTS) and the Philippines Disaster Resilience Foundation (PDRF), joined in the IAdapt Program of PDRF targetting the development of the PAGASA Public Service Continuity Plan, to ensure that its Mission-Essential Functions is sustained in case of any form of interruptions.

On October 12, 2020, the PAGASA Public Service Continuity Management Team – Technical Working Group was reinforced to conduct series of meetings and brainstorming with the guidance of PDRF on the preparation of PAGASA's PSCP. This will to ensure the Agency's unwavering service to the public in case any fortuitous event takes place.

PAGASA Celebrates 2020

National Women's Month

As the National Women's Month is celebrated in 2020, the Philippine Commission on Women exults every woman: Babae, pambihira ka! Women are extraordinary in strength, passion, wisdom, vigor, and heart. They dare to break stereotypes that have long imprisoned them, battle discrimination, and survive every hurdle, to emerge stronger. Women from different backgrounds and places, strive to show that this world is a world for everyone.

On March 9, 2020, PAGASA commenced the celebration of 2020 National Women's Month through an essay writing contest that highlights the empowerment of women as active contributors to and proponents of development. The theme centered on the extraordinary contribution of women in all aspects of the society. Winners of the said contest came from FPMD (3RD PLACE), AD (2ND PLACE) and RDTD (1ST PLACE).

The celebration honors those who refuse to conform with the standards of "womanhood" that the society dictates. The societal norms include seemingly basic aspects - clothes to wear, hair color, body size, body hair, makeup – to actions and decisions in life like occupation, housework, relationships, marriage, keeping the maiden name, leadership, profession, and many others. Every decision is for a woman to make. Every woman must measure up to her own standards of being.

PAGASA PRIME-HRM:
Bronze Awardee

It is with pride to recognize the worthwhile efforts of PAGASA to pursue and comply the required measures of the Civil Service Commission to comply with standard guidelines and SOPs particularly on the Human Resource Systems.

The Program to Institutionalize Meritocracy and Excellence in Human Resource Management (PRIME-HRM) assesses the agency's human resource management systems, practices, and competencies toward HR excellence. Having a Bronze award means that the four (4) core HRM Systems such as: Recruitment, Selection, and Placement, Learning and Development, Performance Management, and Rewards and Recognition passed the Maturity Level II qualification requirements after the rigorous re-assessment of the Civil Service Commission. The CSC validation confirmed that the Agency has not only met all the PRIME HRM level II in all the four (4) core HRM systems but also observed the Civil Service Law and rules on appointments and other HR programs.

CSC
CIVIL SERVICE COMMISSION
Republic of the Philippines

PRIME HRM

This

BRONZE AWARD

is conferred upon the

Philippine Atmospheric, Geophysical and Astronomical Services Administration

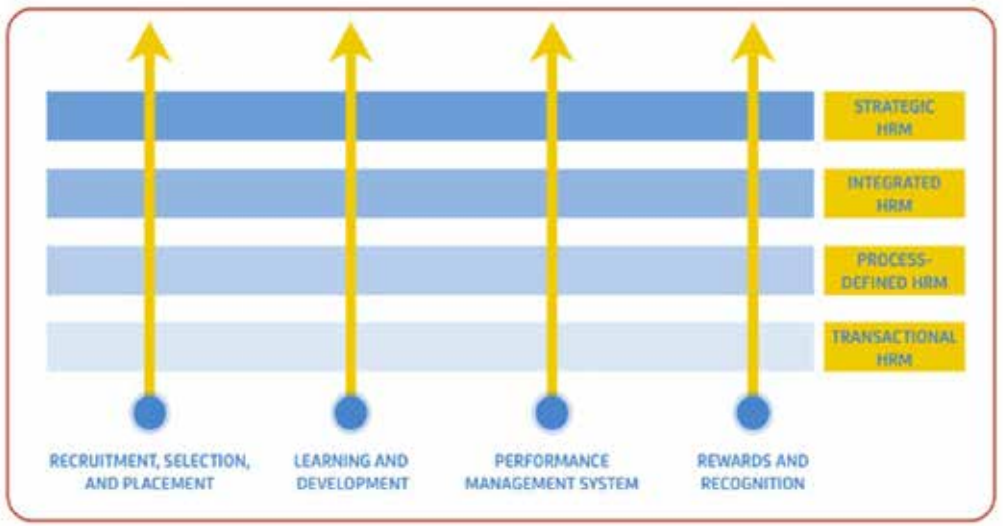
pursuant to CSC Resolution No. **2001086** dated **23 December 2020** **for having managed** and implemented **its human resource** management systems acc[illegible]ng to documented processes, thereby achieving a process-defined HRM in the four core HRM systems under the Enhanced Program to Institutionalize Meritocracy and Excellence in Human Resource Management (PRIME-HRM).

Given on the occasion of the 120th Anniversary of the Philippine Civil Service in Quezon City, Philippines.

ALICIA dela ROSA-BALA
Chairperson

AILEEN LOURDES A. LIZADA
Commissioner

Excellent Public Service Delivery



With this award, the Agency is now granted Authority to take final actions on appointments and are entitled to privileges such as exemption from Section 96 of the 2017 ORAOHRA, discounts from trainings/conferences of Agency representative and HRMO and others benefits that the CSC may approve.

The Human Resource Management and Development along with the Technical Working Groups of the PAGASA PRIME-HRM Committees spearheaded by the Champion, Dr. Vicente B. Malano, worked hand- in-hand to ensure compliance. It is worthy to mention that the Agency conducted five (5) Orientation on PRIME-HRM seminars to ensure that all key players, which include the top management and the rank-and-file employees are engaged and well-informed of their responsibilities

The challenge in moving to the next level is another step, hence the Agency shall continue its efforts in achieving HR excellence through the PRIME-HRM to ensure Effective Public Service Delivery.

On December 1, 2020 the Department of Science and Technology - GAD and Regional Support Service with the headship of Dr. Elizabeth A. Fontanilla, Director, ALS and GRSS, and DOST-wide GAD Focal Person, for the first time, conferred the 2020 DOST GAD Mainstreaming Awards to commendable DOST agencies and regional offices for excellently executing gender mainstreaming and promoting gender equality and women empowerment in their own organizations.

The recognition was built on Section 42 of RA 9710 or the Magna Carta of Women which provide for the founding of incentives and awards systems to give due recognition to commendable agencies and regional offices for their achievements and performance in safeguarding gender mainstreaming implementation in their policies, programs, projects and activities towards attaining gender equality and women empowerment in their organizations and among their stakeholders.

Out of 18 agencies, DOST-PAGASA bagged the third place after the assessment with the use of Philippine Commission on Women's Gender Mainstreaming Evaluation Framework (GMEF), based on their scores in the four entry points – Policies, People, Enabling Mechanisms, and Programs, Projects, and Activities. DOST Secretary Fortunato T. de la Peña declared the winners via Facebook livestream during the DOST virtual flag ceremony.

PUBLISHED PAPERS

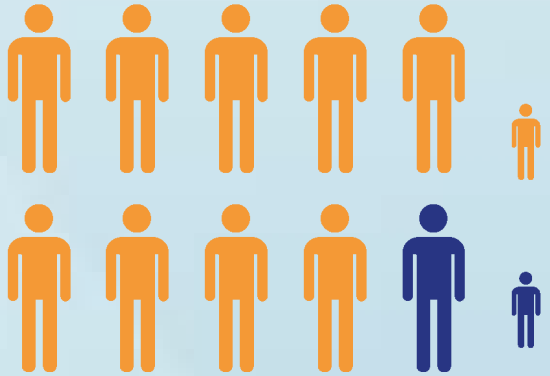
Title	Author	Publication or Journal
The State of Climate 2018	**EDITORS** Rodel Lasco[1] and Vicente Malano[2] **EDITORIAL ADVISORY BOARD** Flaviana Hilario[2], Edna Juanillo[2], and Perpilili Vivienne Tiongson[1] **PRODUCTION TEAM** **[1]Oscar M. Lopez Center** Rafaela Jane Delfino, Marco Macapagal, Annie Beldia, and Katherine Sarmiento **[2]PAGASA** Thelma Cinco, Rosalina de Guzman, and Christian Mark Ison	Oscar M. Lopez Center *Science for Climate-resilient Communities*
ClimDatPh: An online platform for Philippine climate data acquisition	M.Q. Villafuerte II, J.C.R. Lambrento, C.M.S. Ison, A.A.S. Vicente, R.G. de Guzman, E.L. Juanillo	*Philippine Journal of Science, Vol. 150 (1), 53–66*
Climatological seasonal changes of wind and rainfall in the Philippines	J. Matsumoto, L.M. Olaguera, D.Nguyen-Le, H. Kubota, M.Q. Villafuerte II	*International Journal of Climatology, Vol. 40, 4843 – 4857*
An improved method to estimate actual vapor pressure without relative humidity data	R.Qiu, L. Li, S. Kang, C. Liu, Z. Wang, E.P. Cajucom, B. Zhang, E. Agathokleous	Elsevier - Agricultural and Forest Meteorology, Volumes 298-299

Title	Author	Publication or Journal
Differential response of rice evapotranspiration to varying patterns of warming	R.Qiu, G.G. Katul, J. Wang, J. Xu, S. Kang, C. Liu, B. Zhang, L. Li, E.P. Cajucom	Elsevier - Agricultural and Forest Meteorology, Volumes 298-299
Development of an updated global land in-situ-based dataset of temperature and precipitation extremes: HadEX3	R.J.H. Dunn, L.V. Alexander, M.G. Donat, X. Zhang, M. Bador, N. Herold, T. Lippmann, R. Allan, E. Aguilar, A.A. Barry, M. Brunet, J. Caesar, G. Chagnaud, V. Cheng, T. Cinco, I. Durre, R. de Guzman, T.M. Htay, W. Maisarah, W. Ibadullah, M.K.I.B. Ibrahim, M. Khoskham, A. Kruger, H. Kubota, T.W. Leng, G. Lim, L. Li-Sha, J. Marengo, S. Mbatha, S. McGree, M. Menne, M. M. Skansi, S. Ngwenya, F. Nkrumah, C. OOnariya, J.D. Pabon-Caicedo, G. Panthou, C. Pham, F. Rahimzadeh, A. Ramos, E. Salgado, J. Salinger, Y. Sane, A. Sopaheluwakan, A. Srivastava, Ying Sun, B. Timbal, N. Trachow, B. Trewin, G. Schrier, G. Vazquez-Aguirre, R. Vasquez, C. Villaroel, L. Vincent, T. Vischel, R. Vose, M.N.B.H. Yussof	Advancing Earth and Space Science (Journal of Geophysical Research: Atmospheres)
A Dispersive Long-Wave Model for Predicting Coastal Flooding due to Storm Surges and Surface Waves in Manila Bay	P.C. Rivera, C.P. Celebre, M.C.C. Uson, M.C.A. Monteverde, J.B. Zerrudo, L.A. Moron, L.J.R. Rico, J.F.S. Panti, S.S. Schneider, S. Paat, Jr.	The Journal of Ocean Technology, Vol. 15, No. 4, 2020

SUMMARY OF PAGASA PERSONNEL

Reference: PLANTILLA OF PERSONNEL as of DECEMBER 31, 2020

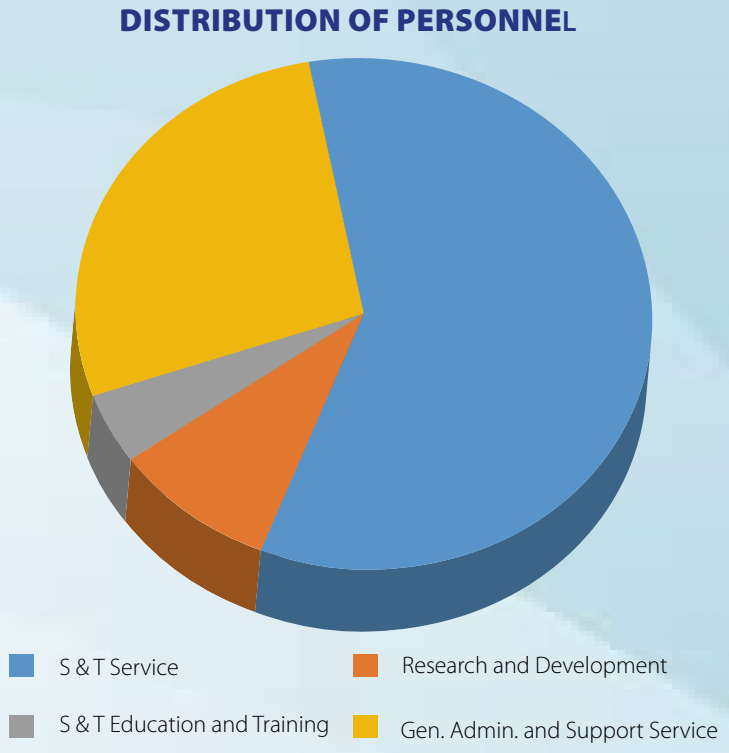
	FILLED	VACANT	TOTAL NO. OF POSITIONS
ADMINISTRATIVE	75	16	91
TECHNICAL	715	152	867
GRAND TOTAL	790	168	958



DISTRIBUTION OF PERSONNEL BY S&T FUNCTION

Reference: PIANTILLA OF PERSONNEL as of DECEMBER 31, 2020

CATEGORY OF PERSONNEL	LEVEL OF EDUCATION				TOTAL	%
	Below BS	BS/ BA	MS/ MA	PhD		
S&T SERVICE (STS)	141	379	37	3	560	70.9 %
Research and Development (R&D)	2	30	20	2	54	6.8 %
S&T Education and Training (STET)	2	5	1	0	8	1.0 %
General Administration and Support Service (GASS)	44	100	21	3	168	21.3 %
TOTAL	189	514	79	8	790	100 %

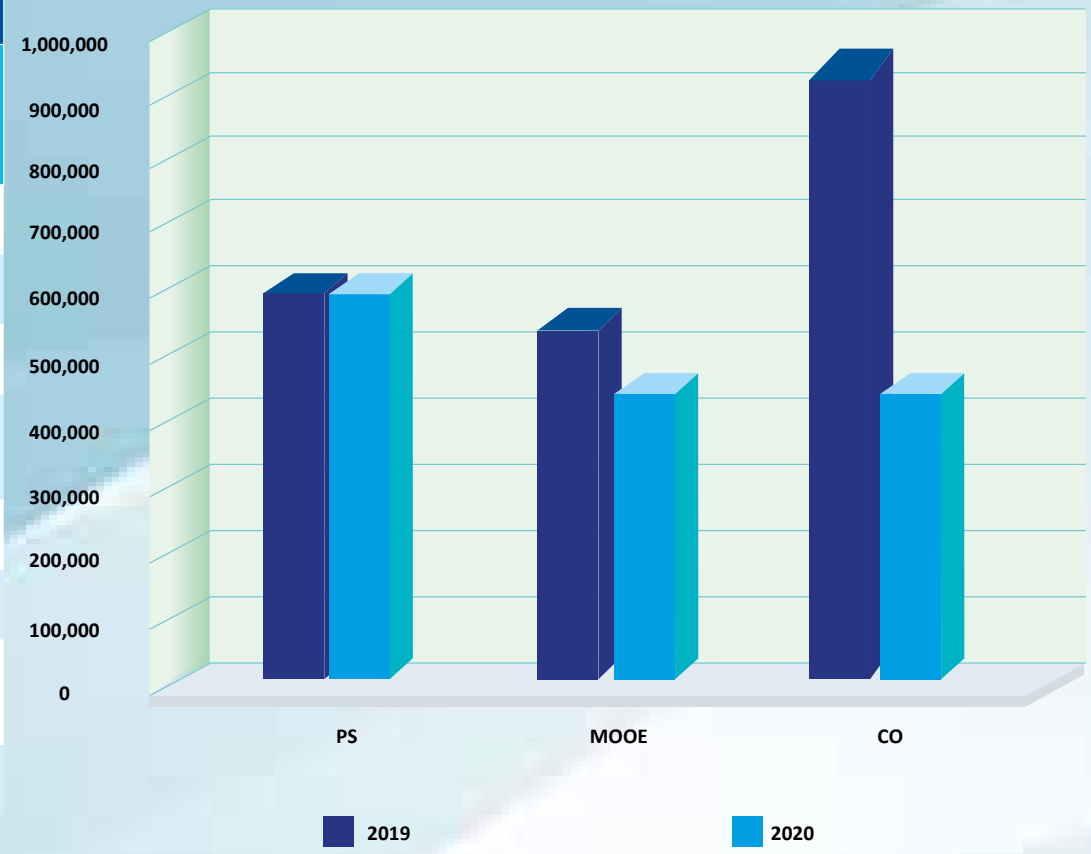


COMPARATIVE EXPENSES, FY 2019-2020

Actual Obligations

(In Thousand Pesos)

	2019	2020	% Incease/ Decrease
PS	565,022	565,164	0.03%
MOOE	535,492	398,361	-26%
Regular	483,395	396,099	-18%
Locally-Funded Projects (LFPs)	52,097	2,262	-96
CO	932,852	374,577	-60%
Regular	648,491	23,229	-56%
Locally-Funded Projects (LFPs)	284,361	351,348	24%
TOTAL	2,003,336	1,338,102	-34%



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We, the production staff, would like to extend our sincerest thanks to Mr. Jose Daniel Suarez and to all the men and women of PAGASA, for their selfless contribution and determined support to the accomplishment of the PAGASA 2020 Annual Report. To God be the Glory.

PAGASA KO

Ganap mang 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 panahan
Makakaasang PAGASA ka

Ang 'yong paglilingkaod
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 ka

Panunumpa ng **Lingkod-Bayan**

Ako ay isang lingkod bayan.
Katungkulan ko ang maglingkod ng buong katapatan at kahusayan
At makatulong sa katatagan at kaunlaran ng aking bayan.

Sisikapin kong patuloy na maragdagan ang aking kaalaman.
Magiging bahagi ako ng kaayusan at kapayapaan sa pamahalaan.
Susunod at tutulong ako sa pagpapatupad ng mga umiiral na batas
At alituntunin nang walang kinikilingan.

Isaalang-alang ko ang interes ng nakakarami bago
ang pansarili kong kapakanan.
Isusulong ko ang mga programang mag-aangat
sa antas ng kabuhayan ng mamamayan.
Aktibo akong makikibahagi sa mga dakilang layunin sa lipunan.

Hindi ako magiging bahagi, at isisiwalat ko ang anumang katiwaliang
maka-aabot sa aking kaalaman.
Gagawin kong kapaki-pakinabang ang bawat sandali.

Sa lahat ng panahon, sisikapin kong makatugon
sa mga hamon sa lingkod bayan.

Ang lahat ng ito para sa ating Dakilang Lumikha, at sa ating bayan.
Kasihan nawa ako ng Maykapal.

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