ISSN 0116-7766

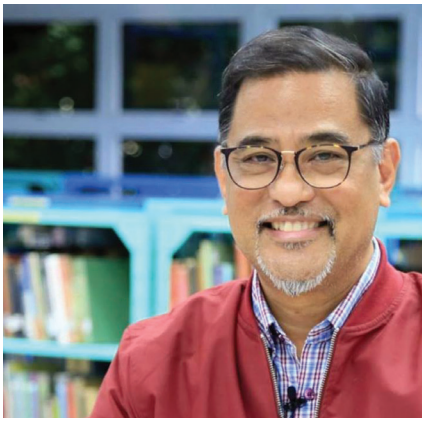
VOL. XXXVI NO.4

S&T POST

OCT-DEC 2018

COLLABORATIVE SCIENCE

Collaborative science



"One of the most enjoyable parts of a science career is collaborative team experiences and developing life-long social networks. When the hypothesis being tested requires innovative efforts greater than any single laboratory, collaboration becomes an essential component for success – everyone is a stakeholder and trust is the driving force".

L. Garry Adams
("Putting together a scientific team: collaborative science)

Gone are the days when scientists worked alone or only with their team in their laboratories. In a study by Okada and Simon (1997), it was found that researchers working together were more successful than those working alone and they were more active in entertaining hypotheses and considering alternative ideas because they constantly ask each other for opinions and ideas.

Some examples of collaborative discovery that helped shape modern science include Jacob and Monod's operon theory of gene regulations in biology; Watson and Crick's DNA molecule structure; and Simon and Newell's work in artificial intelligence. In these three cases, Okada found that the key to the success of these studies was collaboration.

The kind of collaboration that worked in all cases were "(a) frequent, intense contact between the participants, (b) an egalitarian and exploratory style of discussion, (c) and a shared interest in the research questions, combined with, (d) a diversity in skills and experience" (Okada et al., 1995).

In this issue, we feature stories of working together to advance science and technology in the country. We have a story on technology transfer experts sharing best practices and policy recommendations that will help move technologies faster to end users. We also have an article on DOST-TAPI helping DOST-PSHS System to develop future inventors.

We feature in this issue the collaboration between the Philippines and Australia through the Department of Science and Technology and James Cook University collaborating on three fields (marine science, natural resource management, and tropical health research) through exchange of scientists, experts, and students.

Also featured in this issue is a story on collaboration between DOST-Philippine Nuclear Research Institute and the International Atomic Energy Agency (IAEA). The Institute, in fact, was designated as an IAEA collaboration center since 2005.

Finally, we feature the story on the collaboration among DOST, Department of Trade and Industry, and the Department of Information and Communications Technology in order to spur the growth of start-ups through business incubators.

Collaboration has become the buzz word in science. Indeed it has become the most efficient and effective way to get things done, especially in bringing science to the people.

Richard P. Burgos

S&T POST
VOL. XXXVI No. 4

Like us on Facebook

DOST-Science and Technology Information Institute
DOST (Library)
DOST STARBOOKS

Publishers Association of the Philippines, Inc.

The S&T Post is published by the Department of Science and Technology-Science and Technology Information Institute (DOST-STII)
with editorial office at DOST Complex, Gen. Santos Avenue, Bicutan, Taguig City.
Telefax: (02) 837-7520
Tel No.: (02) 837-2071 to 80 local 2148
Email: dost.digest@gmail.com

Visit:
www.stii.dost.gov.ph

DOSTv

Science For The People

DOSTv is the official weather and science program of the Department of Science and Technology (DOST) to communicate Science For The People, promote a culture of science and technology, and raise the aspirations of the youth to pursue careers in Science, Technology, Engineering and Mathematics (STEM) and be leaders of the future.

The program airs at 11:00 a.m. from Monday to Friday at the www.dostv.ph and on the new DOSTv mobile app. Its daily broadcast of livestreaming can also be accessed via www.facebook.com/DOSTvPH and www.dostvph/youtube.

Catch DOSTv from Monday to Friday, on PTV4 at 9:30 a.m. and on GNN at 11:00 a.m. and 4:00 p.m.!

Balitang RapiDOST

A flash report segment that showcases events, programs, and services of the DOST agencies and regional offices, as well as other news and updates on science and technology

DOST-PHIVOLCS update

A segment that showcases news and information related to earthquakes, volcanic eruptions, and natural hazards in collaboration with the DOST-PHIVOLCS

NegoSiyensya

A segment that showcases the success stories of micro, small, and medium enterprises and assisted communities that adopted the technology-based livelihood programs of the DOST

SineSiyensya

A documentary segment which features inspiring stories of individuals or groups benefiting from the DOST interventions

Sustansyarap

A segment that features nutritious Filipino recipes and cooking tips for a healthy lifestyle in collaboration with the DOST-FNRI

Sci-Facts

A segment that showcases facts and trivia related to science, technology, engineering, and mathematics

Weather Report

A day-to-day weather update and information in collaboration with the DOST-PAGASA

Global Science

A news segment about updates on science and technology (S&T) around the world

ExperTalk

A segment that showcases various interviews with experts in the field of S&T

DOST DOST-STII

www.dostv.ph DOSTv

DOSTvPH DOSTv

S&T POST

ISSN 0116-7766 Vol. XXXVI No. 4 OCT-DEC 2018

TABLE OF CONTENTS

WHAT'S NEW

4 Diwata-2's space launch bolsters space tech dev't in PH

DOST NEWS

6 DOST-STII to give clients better info services through InfoSerbilis

7 DOST-TAPI awards 554 IP certificates to stakeholders

8 S&T forum highlights science-related legislative bills

9 DOST chief highlights DOST-PNRI achievements on 46th Atomic Energy Week

SCIENCE NEWS

10 DOST-PHIVOLCS teaches P'que folks how to prepare for quakes, tsunamis

11 Bacteria help rice grow more roots to fight drought, research says

12 Mushroom extracts found useful against black spots in shrimps

13 Study on 'bangaw' to aid PH forensics

14 Seaweed species may have anticancer benefits, study says

15 "Ingenui-tea": DOST-FPRDI experts turn tea scraps into wood glue additive

MAIN FEATURES

16 DOST boosts Filipinnovation in entrepreneurship and inclusive growth

18 Tech transfer experts share best practices, policy recommendations at forum

20 DOST finds a partner down under

21 Int'l confab underscores contributions of nuclear S&T

22 DOST ties up with IBM, US Peace Corps to improve systems, services

24 PH hosts ASEAN Science Ministers Meeting

25 DOST-TAPI, PSHS train trainors to develop future inventors

26 Interagency collab targets to boost tech start-ups

RSTW 2018

28 Agri tech innovations highlight DOST-IX S&T fair

30 DOST, LGU team up to provide jobs, boost ecotourism in Apayao

32 ICYMI: Top five happenings at DOST-CALABARZON's RSTW 2018

36 Visayan entreps honored at reg'l S&T fair

38 DOST-MIMAROPA celebrates S&T week in Occidental Mindoro

ABOUT THE COVER

Collaborative science, in essence, is the working together of people and people, machines and machines, and people and machines. Such collaboration results in efficiency and quality that improves people's lives. The harmony of working together as illustrated by the robot and piano leads to better and grander ideas and initiatives that spur growth in the country's science community.

NBW

42 R&D institutions key to biotech development in PH, says DOST chief

43 Journalist challenges student-writers to communicate biotech's benefits

44 Biotech makes sugar industry 'sweeter'

46 Women shine at Pisay's biotech career forum

47 Biotech lab kits eyed to aid HS studes in science experiments

WHO'S WHO?

48 Bicolano DOST scholar aces licensure exams

49 Then homemade, now big time! MJ Foods journey to success through SETUP

50 Pinay scientist wins 2018 ASEAN-U.S. Science Prize for Women

51 DOST-VIII director bags Presidential Lingkod Bayan Award

52 2017 Best SETUP Adoptor in Region I: Mike's quality steel fabrication

54 DOST-IX receives quality management proficiency recognition

SFTP

55 Science For The People

OTHER FEATURES

56 From Manila to CDO: STARBOOKS convention highlights partnerships

58 Nobel Laureate honored for championing STI

59 Filipino Inventors Society celebrates its diamond year

60 DOST's project boosts Marawi kids' health

62 Gov't agencies converge to boost farmers' production thru carrageenan

Diwata-2's space launch bolsters space tech dev't in PH

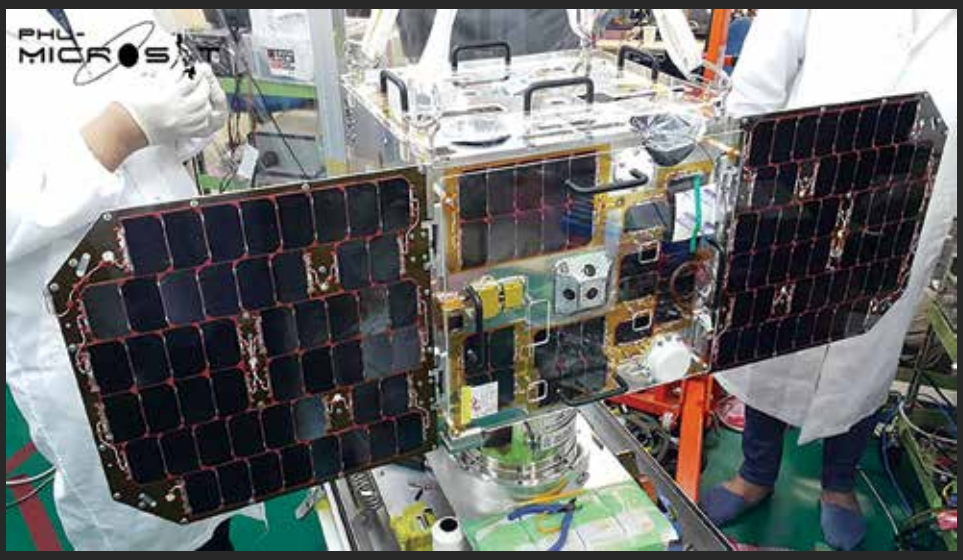
By Dianne L. Tating, *DOST-PCIEERD*

DIWATA-2, THE PHILIPPINES' second microsatellite, was launched into space on 29 October 2018 hitching a ride via H-IIA F4 rocket from the Tanegashima Space Center in Japan at exactly 12:08 p.m. (PhST) and started orbiting in space at 12:51 p.m. (PhST).

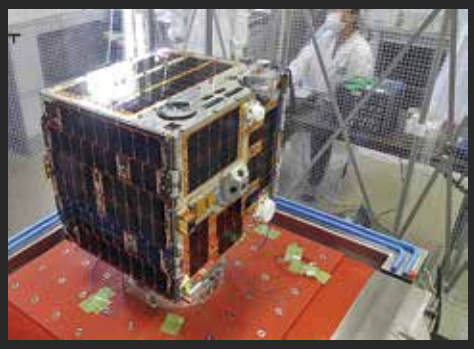
The actual launching in Kyushu, Japan was witnessed by Department of Science and Technology (DOST) Secretary Fortunato T. de la Peña, University of the Philippines (UP) Diliman Chancellor Michael L. Tan, Philippine Deputy Chief of Mission to Japan Eduardo M.R. Meñez, Philippine Scientific Earth Observation Microsatellite Program (PHL-Microsat) Program Leader Dr. Joel Joseph S. Marciano, and DOST-Philippine Council for Industry, Energy and Emerging Technology Research and Development (PCIEERD) officials, Edna C. Nacianceno and Engr. Ermie M. Bacarra.

The launch of Diwata-2 was witnessed via livestream from the Japan Aerospace Exploration Agency YouTube channel at

The H-IIA F4 rocket at the Tanegashima Space Center in Kyushu, Japan which carried Diwata-2 into space. (Photo from JAXA)



Solar Array Panel Deployment Test of Diwata-2 Flight Model. (Photo from PHL-Microsat)



the GT Toyota Asian Center Auditorium in UP Diliman by officials from the DOST, UP Diliman, and Japan Embassy in the Philippines. Representatives from the office of Senator Paolo Benigno "Bam" A. Aquino IV, researchers, students, reporters, and journalists also viewed the launch of Diwata-2.

During the local viewing, the DOST Undersecretary for Research and Development Dr. Rowena Cristina L. Guevara expressed optimism over the future of space science and space technology applications with the launch of Diwata-2.

"The reason why we are doing this is not just because we can launch a microsatellite, but more so because we would like to develop the human resource needed in order for us to actually put up a Philippine Space Agency and for the Filipinos to benefit using the data received from the satellites," said Usec. Guevara.

Similar to Diwata-1, Diwata-2 will capture images for the country's environmental monitoring and post-disaster assessment. It has the same payload or apparatus but more refined and improved, namely the wide field camera, middle field camera, high precision telescope, and spaceborne multispectral imager with liquid crystal tunable filter.

The second microsatellite differentiates itself from its predecessor with its longer life span of five years or more. It flies at a lower altitude where there is more atmospheric drag that can slow down the satellite motion. Its orbit is "sun synchronous", which means that it has the same orbital speed as that of the sun. This enables fixed revisit intervals and allows environmental monitoring in specific areas. Further, major features of Diwata-2 include two locally-made experimental modules: amateur radio unit for emergency communications and a satellite orientation module for increased pointing accuracy and future satellite development initiatives. It also has deployable solar panels for increased power generation output and additional payloads namely the enhanced resolution camera and spaceborne multispectral image.

PHL-Microsat Project 5 Leader Dr. Gay Jane P. Perez said Diwata-2's launch bolsters the government's move to create space technology industry in the country.

"More than building and launching satellites, the Philippines is also committed to starting a healthy and sustainable ecosystem for space technology," she said.

Dr. Perez added that the creation of the Sustained Support for Local Space Technology and Application Mastery, Innovation and Advancement (STAMINA4Space), an offshoot of the PHL-Microsat program, aims to build a local industrial base and enhance local space science and engineering expertise, paving the way for the establishment of the Philippine Space Agency.

The development of Diwata-1 and Diwata-2 was funded under the DOST Grants-in-Aid program titled "Development of the Philippine Scientific Earth Observation Microsatellite" in collaboration with the UP Diliman, DOST-Advanced Science and Technology Institute, and partners from Hokkaido and Tohoku universities in Japan. The DOST-PCIEERD serves as the project's monitoring agency.

DOST-STII to give clients better info services through InfoSerbilis

By David Matthew C. Gopilan, *DOST-STII*
Photos by Gerardo G. Palad, *DOST-STII*

Library and information management staff and information officers of various agencies of the Department of Science and Technology discuss the results of their situation, stakeholder, and communication analyses. All are vital in ensuring that InfoSerbilis can be adopted by their respective agencies, and client-friendly.

INFORMATION OFFICERS, library and information center management staff of the Department of Science and Technology (DOST) recently worked together to help develop a unified information service delivery for the Department.

Dubbed InfoSerbilis, this unified information service delivery aims to give clients a very satisfactory experience with DOST services.

Alan C. Taule, chief of the Information Resources and Analysis Division (IRAD) at DOST-Science and Technology Information Institute (STII), explained that InfoSerbilis sees the information flow in DOST as "not just for millennials but also for the older generation, especially for those who are able to cope with the changing times."

He gave as an example a unique library experience at DOST-STII.

"We want to reinvent our library for the 21st century," he said.

"The idea of a quiet library is already archaic and we want to make it suitable for the 21st century," added Taule.

Moreover, Taule said InfoSerbilis will give information that is simpler and more direct while achieving a higher level of satisfaction and trust from the recipients.

InfoSerbilis will tap the current structure of the DOST Science and Technology Information Network of the Philippines (ScINET-PHIL) which allows the streamlining of information delivery, especially response to queries within the Department and the public.

ScINET-PHIL, a network of all libraries and information centers under DOST, aims to promote and improve the internal flow of S&T information in the Department and other S&T institutions in the country through active resource sharing and networking.

During the forum, InfoSerbilis representatives from various DOST agencies and regional offices participated in situation analysis, communication strategy, and monitoring and evaluation plan to beef up InfoSerbilis and make it adaptable. They also reviewed ScINET which was last revisited three years ago.

Haziel May C. Natorilla, science research specialist II of IRAD, explained that InfoSerbilis was built on the P Process, one of the tools in strategic communication. It begins with analysis of problems, audiences, and situations followed by designing appropriate strategies, developing and testing the strategy, implementation and monitoring, and lastly, evaluation and replanning. Results from the fifth step will then be incorporated in step two for relearning.

The forum was held on 8 to 9 November 2018 at the BSA Twin Towers, Ortigas Center in Mandaluyong City.

Meanwhile, InfoSerbilis was launched on 12 December 2016 by Dr. Ma. Theresa H. Velasco, former dean of the College of Development Communication of the University of the Philippines Los Baños, along with students of the Development Communication special program for DOST employees.

InfoSerbilis goes along with DOST's new tagline, "Communicating Science for the People"; thus information delivery about the Department's programs and services must be fast, accurate, and satisfying to the clients, explains Alan C. Taule, IRAD Chief, DOST-STII.

DOST-STII then integrated InfoSerbilis as a project component under the Enhanced S&T Experience using Leading-Edge Learning Additions and Realities project.

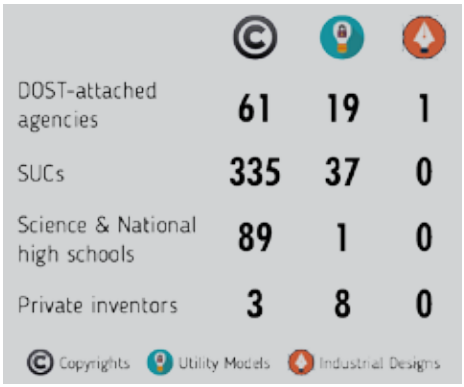
DOST-TAPI awards 554 IP certificates to stakeholders

By Maricon R. Avila, *DOST-TAPI*

(L-R): Glenda C. Rima and Atty. Marion Ivy D. Decena of DOST-TAPI, Director Lolibeth R. Medrano of IPOPHL, Prof. Adeline A. Pacia and Dr. Fidel R. Nemenzo of UP Diliman, and Director Edgar I. Garcia of DOST-TAPI. (Photo from DOST-TAPI)

SOME 554 intellectual property (IP) certificates were recently awarded to various Department of Science and Technology research and development institutes, state universities and colleges (SUCs), high schools, and private inventors, a proof that Filipinos are becoming more aware of the need to claim ownership to their innovations and technologies.

The DOST-Technology Application and Promotion Institute (DOST-TAPI) awarded a total of 61 copyrights, 19 utility models, and one industrial design to DOST-attached agencies. In addition, 335 copyrights and 37 utility models were given to SUCs while 89 copyrights and one utility model were handed over to science and national high schools. Further, three copyrights and eight utility models were awarded to private inventors.



Infographics by Josemaria T. Zarraga.

For the past decades, the DOST-TAPI has been assisting technology generators and inventors in securing IP protection through its IP Rights Assistance Program (IPRAP).

DOST-TAPI Director Edgar I. Garcia said that the event only proves that the stakeholders own their innovations and technologies by obtaining IP protection.

"We want those certificates to be of use as innovations in the industry and enterprise development or in your own businesses," said Dir. Garcia.

He also said that commercialization of these protected technologies is the next step and that the Institute is very willing to assist them further.

"DOST-TAPI takes responsibility in the commercialization of these innovations which you have already generated," added Dir. Garcia.

The IP certificates from the Intellectual Property of the Philippines (IPOPHL) were awarded on 25 October 2018 at the Philippine International Convention Center in Pasay City.

Subsequently, Atty. Lolibeth R. Medrano, director of the Bureau of Patents of the IPOPHL, said that they acknowledge DOST-TAPI's support for IP protection and technology commercialization to the market through technical and financial assistance.

"I have recognized the critical role and the value of partnership with DOST-TAPI as among the most vital in developing a national culture of innovation and creativity," said Medrano.

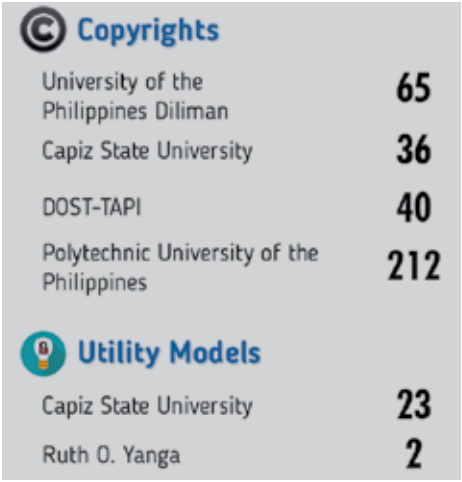
She added that IPOPHL looks forward to further partnership with DOST-TAPI.

Moreover, Atty. Marion Ivy D. Decena, chief science research specialist of DOST-TAPI's Invention Development Division informed the awardees and guests that through the IPRAP, the number of quality local patent filings has increased in recent years.

"From 2008 to 2018, the Institute has assisted more than 4,000 IP applications with our increasing targets of 1,000 IP applications filed per year," said Decena.

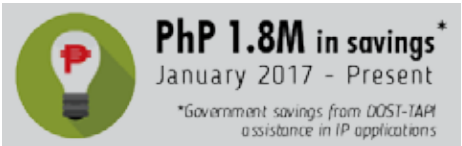
The University of the Philippines Diliman, Capiz State University, and the DOST-TAPI received 65 copyrights, 36 copyrights and 23 utility models, and 40 copyright certificates, respectively.

Meanwhile, Polytechnic University of the Philippines received 212 copyright certificates, and Ruth O. Yanga, an inventor, received two utility model certificates.



DOST-TAPI patent agents, Caezar Angelito Arceo, Engr. Janeth Cruzada-Vidal, Engr. Roberto Verzosa, and Anna Liza B. Saet were also recognized for their efforts in working closely with the researchers and inventors to draft and file their technologies.

The Institute's in-house patent agents have accumulated an estimated total savings of around PhP 1.8M from January 2017 to present.



Members of the Association of Patent Professionals, Inc. were present during the event, including Atty. Neptali L. Bulilan of Sapalo Velez Bundang and Bulilan Law Offices, Atty. Bayani B. Loste of Fortun Narvasa and Salazar Law Offices, and Atty. Editha R. Hechanova of Hechanova & Co., Inc.

These law firms and offices have been providing assistance to DOST-TAPI's clients in the preparation of patent documents and prosecution of IP applications.

S&T forum highlights science-related legislative bills

By Enrico P. Belga Jr., and David Matthew C. Gopilan, *DOST-STII*
Photos by Neil Anjo B. Bio, *DOST-STII*

Science and technology (S&T) related legislative bills that are currently pending approval in the House of Representatives were the center of discussions at the recent Science and Technology Legislative Forum held in Legazpi City, Albay on 28 to 29 November 2018.

Attended by representatives from various Provincial Science and Technology Centers (PSTC) around the country, the forum sought to strengthen legislative policy advocacy on S&T programs and to generate support from all stakeholders for the approval of the S&T related bills pending in the Congress.

"This forum would not only be about updates or S&T concerns, but it would hopefully strengthen the partnership among personnel from PSTCs," Department of Science and Technology (DOST)-Region V Director Tomas B. Briñas said in his opening remarks during the event.

Staff from various DOST attached agencies and DOST Regional offices gather to discuss major S&T legislatives amendments crucial to the future of science and technology in the Philippines. The 4th S&T Legislative Forum was held in Legazpi City, Albay on 28-29 November 2018. (Photos by Neil Anjo B. Bio, DOST-STII)

Modernizing how Filipinos measure

Currently, Albay Representative Joey S. Salceda is pushing for a bill that would revise the National Metrology Act of 2003 and make the current National Metrology Laboratory (NML) more responsive to the times.

The House Bill (HB) 4368 or the "Enhanced National Measurement Infrastructure System" aims to protect Filipinos from wrong measurements that may affect health, safety, fair trade, environment protection, and law enforcement. It builds on the National Metrology Act which was first enacted in 2003.

Once HB 4368 becomes law, it would transform the NML to the National Metrology Institute (NMI) of the Philippines, which will be headed by a director general under the DOST.

As of now, the NML is responsible for overseeing the national measurement system. With a limited manpower, facilities, and financial resources the task is too much for the NML. NML is currently a division under the DOST-Industrial Technology Development Institute (ITDI).

"Even before we learned how to read, we learned to count first," said Ahdrian Camilo C. Gernale, deputy section head of the Force Standards Section at the DOST-ITDI, while explaining the importance of metrology or the scientific study of measurement. "Simple deviations from the standard or normal may mean life and death," he added.

For example, an incorrect measurement from a broken sphygmomanometer would most likely affect a doctor's report on a patient's blood pressure. Correct measurement too would ensure car owners that they get the correct amount of fuel they are paying for as reflected in calibrated gas pumps.

Metrology indeed affects all human activities, and the bill would like to ensure that Filipinos get correct measurements.

Pushing for space agency development

The forum also tackled the benefits of space S&T. For one, satellite images can capture the before-and-after scenario of, for example, vegetation and buildup of structures in Boracay. Using the data captured by the satellite, it would be easier to monitor human activities and recommend environment-friendly plans.

Satellite images can also show the extent of a recent landslide in Itogon, Benguet or damages caused by a typhoon. The data generated by the satellite would make it easier for the National Disaster Risk Reduction and Management Council to know where to exactly deploy a response team.

All of these activities will be consolidated by the Philippine Space Agency (PhilSA) once HB 8541 or the Philippine Space Development Act has been enacted. Once established, PhilSA will lead the policy formation, planning and coordination, as well as implementation of all issues and activities related to space science and technology. The agency will be under DOST.

PhilSA, according to the bill, will be guided by a framework disclosing five key development areas: international cooperation; space education and awareness; space research and development; hazard management and climate studies; and national security and development.

Proposed amendments to the Republic Act No. 8439 of the "Magna Carta for Scientists, Engineers, Researchers, and other S&T Personnel in the Government" were also discussed during the forum. There were several notable amendments presented, including the one that removes set limit to the amount of additional salary or honoraria that scientists can receive as compensation from internally or externally-funded grants-in-aid, provided this is part of a budget from the funding agency and does not entail additional usual expense to the government. In addition, the Hazard Allowance for S&T personnel would see an increase from 10 to 30 percent to 15 to 30 percent. Also included in the proposed Magna Carta amendments is to upgrade S&T provincial officers to director level.

Another proposed bill is the "Comprehensive Nuclear Regulation Act" which was approved by the House Committee on Appropriation on August 28, 2018. It aims to create a single, independent regulatory body which will be called Philippine Nuclear Regulatory Commission to respond to the need for regulation of peaceful applications of nuclear energy

DOST chief highlights DOST-PNRI achievements on 46th Atomic Energy Week

By Hans Joshua V. Dantes, *DOST-PNRI*
Photos from DOST-PNRI

BRINGING NUCLEAR and radiation applications closer to the Filipino people, the Department of Science and Technology-Philippine Nuclear Research Institute (DOST-PNRI) celebrated the 46th Atomic Energy Week (AEW) on 10-14 December 2018 at the DOST-PNRI compound with the theme "Nuclear Science and Technology for the People: Innovation for Collective Prosperity."

The annual AEW celebration, as mandated under Presidential proclamation No. 1211 in 1973, aims to generate awareness of the Filipino people on the beneficial uses of nuclear science and technology.

DOST Secretary Fortunato T. de la Peña cheered the Institute for its several accomplishments for the year. He said that the DOST-PNRI received PhP 80 million research grant for two and a half years, resulting in many research and development projects accomplished by the Institute. Another good result of the grant is that DOST-PNRI produced a notable number of publications.

Sec. de la Peña also announced that Dr. Lucille V. Abad, one of the Institute's prolific researchers, was named as Scientist II and will take her oath that day, 10 December 2018.

DOST-PNRI is also actively commercializing its R&D results such as the Carrageenan Plant Growth Promoter, the Secretary said.

Further, Sec. de la Peña noted the Institute's upgrading of its laboratories.

Other guests during the Opening Ceremonies were DOST Undersecretary Rowena Cristina L. Guevara, Quezon City Councilor Precious Hipolito-Castelo, who represented Quezon City Vice Mayor Joy Belmonte-Alimurung, and Atty. Teresa Ira Maris P. Guanzon who delivered the keynote message of Senator Sherwin "Win" T. Gatchalian, chairperson of the Senate Committee on Energy.

The Institute opened its 1st Nuclear Research and Development Conference on the afternoon of 10 December and on 11 December with in-depth presentations by DOST-PNRI scientists and researchers on various nuclear and radiation applications in agriculture, food, health and medicine, industry, and the environment.

DOST-PNRI also showcased several open-house technical exhibits with free guided tours for all visitors on 12 to 13 December and on the morning of 14 December. The exhibits featured the latest nuclear and radiation technologies, products, and services by DOST-PNRI.

As a pre-event, senior high school students, college students and young professionals attended the Fourth Philippine Nuclear Youth Summit held on 4 December, organized by the Philippine Young Generation in Nuclear (PYGN), an organization of young Filipinos that promotes the practice of nuclear science and technology in the Philippines. Officials and representatives from the International Youth Nuclear Congress also graced the summit.

Meanwhile, 34 teams of high school students from across the country competed in the national level of the 2018 Philippine Nuclear Science Quiz on 13 December.

The students from Philippine Science High School-Central Visayas Campus got the first place, followed by Davao City National High School in second place and Philippine Science High School–Cordillera Administrative Region Campus in third place. Tied at fourth place were the students from Negros Occidental High School and Philippine Science High School–Eastern Visayas Campus.

DOST-PHIVOLCS teaches P'que folks how to prepare for quakes, tsunamis

By Melissa Mae P. Tamayo, *DOST-PHIVOLCS*
Photos from DOST-PHIVOLCS

IN OBSERVANCE of the World Tsunami Awareness Day, the Department of Science and Technology-Philippine Institute of Volcanology and Seismology (DOST-PHIVOLCS), DOST-National Capital Region, and the city government of Parañaque held a two-day "Tsunami Awareness and Preparedness Forum and Exhibit" on 5 to 6 November 2018 at the Parañaque Sports and Social Hall in Parañaque City.

Dubbed #HandaAngMayAlam, the activities in the said event were intended to promote tsunami awareness and disaster risk reduction and management through DOST-PHIVOLCS information products. The event also aimed to capacitate the public with the right information to prepare, respond, and protect oneself in the event of an earthquake and/or tsunami.

"We should be aware of all the earthquake hazards that could affect us and prepare for it, not only the ground shaking caused by large earthquakes but also other hazards like tsunami," said Dr. Renato U. Solidum Jr., DOST Undersecretary for Disaster Risk Reduction and Climate Change and officer-in-charge of DOST-PHIVOLCS.

Metro Manila, specifically the cities of Valenzuela, Navotas, Malabon, Manila, Pasay, Las Piñas, and Parañaque face the threat of tsunami that could be generated from a possible movement of the Manila Trench. There are historical evidences of tsunami in Metro Manila, and if the same happens now, many people are exposed to danger, warned Dr. Solidum.

"It is important to make sure that the people are informed of what can happen so they can prepare," he added.

Quoting an old Japanese proverb, Usec. Solidum reiterated that, "the next disaster strikes after we have forgotten the last one."

"It is important that we learn from past experiences so we know how we can prepare in case it happens again in the future," added Usec. Solidum.

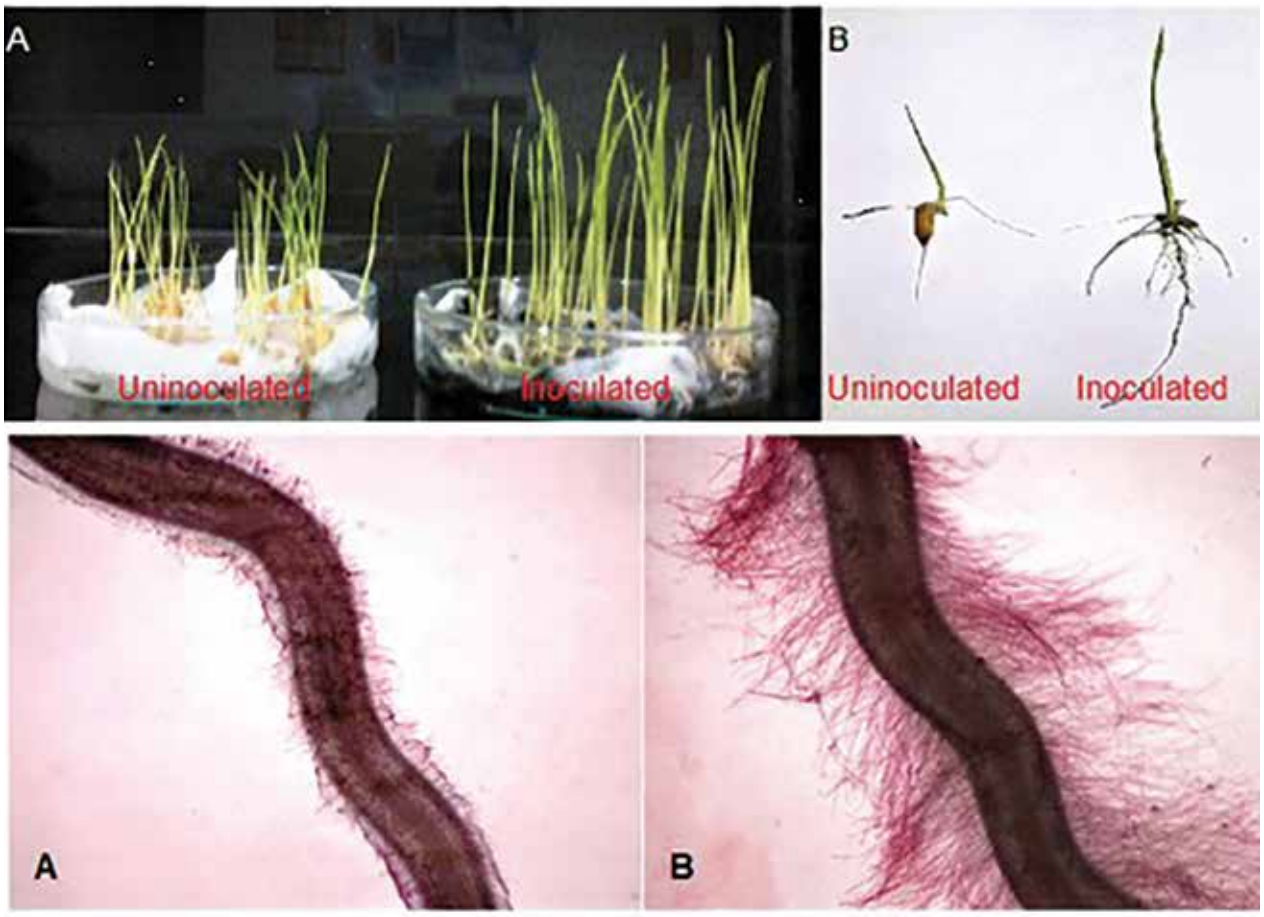
DOST-PHIVOLCS geologist explains to students the propagation of tsunami through the tsunami simulation tank model.

A DOST-PHIVOLCS staff discusses the story behind tsunami peel from the 1994 Mindoro earthquake and tsunami.

DOST-PHIVOLCS advocates for the conduct of community-level awareness about earthquakes and tsunamis focused on natural signs of an approaching local tsunami, warning, and evacuation procedure.

Bacteria help rice grow more roots to fight drought, research says

By David Matthew C. Gopilan, *DOST-STII*



Uninoculated versus inoculated. *Top: Seedlings treated with Streptomyces mutabilis have longer leaves and roots as compared with untreated ones. Bottom: Viewed through a microscope with 400x magnification, treated seedings have more hairy roots, making them more effective in getting nutrients and water from soil. The researchers dyed the roots for easy viewing.*

RESULTS OF a study reveal that a certain bacteria can induce larger and more extensive root system when applied to planted rice, thereby improving drought tolerance.

The study was conducted by a group of scientists from the Philippine Rice Research Institute (PhilRice), along with students from Muñoz National High School in Science City of Muñoz, Nueva Ecija.

Led by Dr. Roel R. Suralta of PhilRice,the researchers reported that rice applied with a dose of the bacteria *Streptomyces mutabilis* showed improved drought tolerance because of its larger roots and more extensive root system.

The study aims to improve the root system of rice grown in uplands where water is scarce. "Upland areas are 100 percent dependent on rainfall to support rice production," said Suralta. "Due to the uncertainty of rainfall brought by climate change, these areas become more and more prone to the occurrence of drought stress," he explained, adding that 10 to 15 percent of all rice fields in the country are considered as uplands.

How were the experiments done?

In the study, the researchers used a method called inoculation, which is likened to vaccination. A particular microorganism called *Streptomyces mutabilis* isolated from Binangonan, Rizal was used for inoculation. Identified as a plant growth-promoting bacteria, *Streptomyces mutabilis* supply the host plant with nutrients and enzymes.

To prepare the inoculation, *Streptomyces mutabilis* was grown in a broth filled with nutrients. The broth was then applied to a sterilized soil sample and later on, to the soil where the rice seedlings will be sown.

The study had two experiments. In the first one, the researchers tested if the seeds of the rice variety NSIC Rc192 (Sahod Ulan 1) would have enhanced shoot (collective term of the plants' leaves and stems) and roots due to the inoculation of rice with *Streptomyces mutabilis*.

In the second experiment, the researchers inoculated rice also with *Streptomyces mutabilis* at different times in a setup mimicking a drought stress. The Central Experiment Station of PhilRice in the Science City of Muñoz, Nueva Ecija housed these experiments.

CONTINUED TO P12

Mushroom extracts found useful against black spots in shrimps

Like other edible mushrooms, the oyster mushroom or Pleurotus ostreatus naturally contains antioxidants that are good for the body. It also contains glutamate, the 'G' in MSG (monosodium glutamate), which gives the 'umami' flavor in dishes. Umami, meaning "savoriness" is considered as the fifth basic taste alongside sweet, sour, salty, and bitter. (Photo from Philippine Mushroom Farming at Wordpress)

By David Matthew C. Gopilan, *DOST-STII*

RESEARCHERS FROM the Bureau of Fisheries and Aquatic Resources (BFAR)-Region II found that using hot water extract from the edible oyster mushroom can prevent black spots in the Pacific white shrimp, *Penaeus vannamei*.

Black spots, technically called melanosis, are discolorations on shrimps during its post-harvest storage. It affects the shrimp's taste and reduces its shelf life. Although past studies say that black spots are harmless to humans and do not cause food spoilage, such change in appearance reduces the marketability of the product, causing financial losses to fisherfolk.

Mushrooms are known to contain antioxidants that can help prevent discoloration in shrimp. Thus, BFAR-Region II researchers Marivic G. Llanto and Dr. Angel B. Encarnacion used edible trimmings from a mushroom farm in Tuguegarao City, Cagayan. The oyster mushroom *Pleurotus ostreatus* was specifically used in this study. This edible mushroom is usually enjoyed with soups and stir-fried recipes.

The researchers prepared solutions at different concentrations from mushroom extracts. They soaked 20 shrimps each in various solutions for an hour. When they learned that the solution with 1 percent mushroom extract prevented melanosis in shrimp, they immersed 20 shrimps each in another set of solutions, including those with ascorbic acid, and another with sodium sulfide.

Shrimp handlers use either of these two chemicals to prevent melanosis. After that, the shrimps were stored in a container with ice for three days, simulating the usual practices of shrimp handlers in transporting their harvest to the market.

"The crude water extract from oyster mushroom fruiting body trimmings can be a cheaper, safer, locally available, and natural alternative to currently used synthetic antimelanosic compounds in the food industry," the researchers concluded.

The Philippines exports shrimps primarily to the USA, Japan, and South Korea. In fact it is one of the two major export products from the aquaculture industry. The archipelagic feature and existing pond culture system in the country are contributory to the annual production of 30,000 metric tons of shrimps.

Findings of this study were reported in the June 2018 issue of the Philippine Journal of Science.

CONTINUED FROM P11

Results of the first experiment showed that rice seeds treated with *Streptomyces mutabilis* had longer shoots and roots three days after germination (the process by which an organism grows from a seed) as compared with untreated seeds. Inoculated rice also had more and longer root hairs, thus its roots can absorb more water and nutrients.

Meanwhile, inoculated rice in the second experiment also have grown longer roots even in a drought-like setup and contributed to the increase in soil water uptake and maintenance in greater shoot growth.

The researchers also weighed the shoot parts of rice that have been oven dried (also known as dry mass) to measure the plant's development. The researchers figured out a unique "trade-off" between inoculation and dry mass production: the rice that had more inoculation produced less dry mass. Why? Repeated inoculation might have increased the population of bacteria, thus creating an unhealthy competition between the roots and bacteria for soil nutrients.

In the paper, the researchers clarified that other factors stressful for plants like extreme temperatures, pests and pathogens, and nutrient deficiencies were not tested.

The full article of the study "An Enhanced Root System Developmental Responses to Drought by Inoculation of Rhizobacteria (Streptomyces mutabilis) Contributed to the Improvement of Growth in Rice" can be downloaded for free in the Philippine Journal of Science Volume 147 No. 1 at philjournalsci.dost.gov.ph. The photos were taken from the published paper.

Study on 'bangaw' to aid PH forensics

By Allyster A. Endozo, *DOST–STII*

In a landmark feat, experts from the University of the Philippines Diliman have established baseline data on the country's blow fly population. With key information on their distribution, identity, and growth rates, local forensic investigators would be aided in setting accurate crime scenarios from the onset of decay of a victim's body.

COMMONLY, THE blow fly (*Chrysomya megacephala*) or *bangaw* in Filipino, is considered a pest that brings dirt on surfaces it lands on. But in the world of research in the Philippines, the abhorred *bangaw* can actually bring clues in crime scenarios, making it a flagship species for forensic entomology.

This is because the *bangaw* is known to be the first insect to arrive and infest corpses on the onset of decay, thus helping investigators determine the time of death, depending on the insect's larvae found in the body.

The species has a wide geographical distribution and reproduces fast, making it very useful in forensic cases.

Further, since the larva moves away from the decomposing body to find a safe place to metamorphose into a pupa, this will give a hint on the time that elapsed since a person died.

Such importance of the *bangaw* in forensic entomology made the insect a popular subject for study.

One such study that focused on *bangaw* is "Forensic Entomology in the Philippines: Establishing Baseline Data on the Forensically Important Blow Fly Species *Chrysomya megacephala* (Fabricius, 1794)" by researchers from the University of the Philippines Diliman.

This is the first study that established baseline data for *C. megacephala* on its known distribution ranges in the Philippines, molecular identification, and developmental rates at semi-controlled conditions of its larval forms.

The study found that *bangaw* which feasts on decaying matter is present in all major localities nationwide based on the study's collected samples. Areas where samples were collected include Camarines Norte, Isabela, Laguna, Marinduque, Quezon City, and Zambales in Luzon; Iloilo in Visayas; and Davao del Sur, General Santos City, South Cotabato, Tawi-tawi, and Zamboanga in Mindanao.

Professor Ronniel Pedales, one of the researchers, has attributed the blow fly's widespread presence to its inherent invasiveness and ability to coexist with human communities.

"*C. megacephala* is characteristically cosmopolitan in the Philippines because it is a native species and is synanthropic—it prefers habitats with human settlements and take advantage of the food availability," he said. "With its current distribution in the Philippines and its ability to withstand competitive species, it is not surprising that this species is found everywhere—from marketplaces to the comfort of our homes," said Pedales.

www.tl.wikipedia.org

The species is so ecologically successful that it managed to gain foothold outside its native region. "It is very interesting to note that this species is known to only occur in Southeast Asia up until about 50 years ago. Now, the species has reached continental United States among many others," he added.

Code to decode

The researchers stressed the importance of properly establishing the identity of *C. megacephala* in order to clearly differentiate it from countless fly species found worldwide. For this, a gene fragment—after being taken from maggot and adult tissues—was replicated for sequencing.

The fragment produced more or less similar DNA barcodes as it yielded a 99.8 to 100 percent match with the international standard, which actually makes it more useful for forensic analysis involving very distant sites.

"The reported variability shown here separates populations that are hundreds of kilometers apart. However, this shows that there is an existing genetic variability among populations and most probably this could be explored through using more variable genes," Pedales explained.

Moreover, the study was also able to estimate the age of the *C. megacephala* pupa based its color. This finding is important in approximating the time when a person died. According to Pedales, once the blow fly species is identified, they can use the information to estimate the growth rate of the maggot and the time of death of a corpse.

Bridging the gaps

The researchers acknowledge the need for a number of factors to be modified and included in the study. For improved accuracy of growth curves, these include the effect of initial egg/maggot count—in conjunction with humidity and temperature—on competition among hatchlings. Thankfully, these challenges present an opportunity for Filipino forensic experts to explore and use even more advanced DNA techniques.

The Philippine National Police is yet to adapt and implement guidelines and protocols in forensic entomology, particularly in establishing local databases. The agency, Pedales lamented, is still left behind in insect evidence-based investigations.

"Forensic science as a discipline is very much ignored—for the lack of a more appropriate term—in the Philippines. There has been a plethora of published work made by local scientists but support and implementation from the government is lacking, if not non-existent," he said.

In spite of all the present challenges, Pedales remains very much positive with the possible implications of this study. "I am hoping that this study will make current students realize that the forensic entomology they see in the TV shows is real and that they could do it themselves. I would like to see many more studies on forensic entomology and the diptera in the future."

Seaweed species may have anticancer benefits, study says

By Geraldine B. Ducusin, *DOST-STII*

RESEARCHERS FROM the University of Santo Tomas found that polysaccharides extracted from Codium species, locally known as *"pukpuklo"* (a seasonally-available seaweed), are effective against cancer cells and destructive enzymes associated with cancer metastasis.

The researchers, headed by Dr. Ross Dizon Vasquez, evaluated the inhibitory potential of the polysaccharides fractions isolated from Codium species. They found that the seaweed fights destructive enzymes that aid metastasis or spread of cancer to different parts of the body.

Polysaccharides are carbohydrates such as starch, cellulose, or glycogen whose molecules consist of a number of sugar molecules bonded together. This kind of carbohydrates are used by the body in storing energy, sending cellular messages, or for providing support to cells and tissues.

Aside from its potential anticancer benefits, *pukpuklo* has also been evaluated for its effect on the skin. Dr. Vasquez said that it induced healthy skin growth and promoted faster healing of rat's skin that was exposed to UVB radiations.

Their next target of study is possible cosmeceutical application or formulation of anti-aging compound from *pukpuklo*. Cosmeceuticals are cosmetic products with bioactive ingredients purported to have medical benefits.

The Codium species were collected in Ilocos Norte, Aklan, Iloilo, and Cagayan province. Pukpuklo, a favorite Ilokano dish, is known as a good source of dietary fiber, amino acids, and minerals. However, little is known about its medicinal value and further studies have yet to be conducted to explore its use in the field of medicine.

Dr. Ross Dizon Vasquez, lead researcher on Pukpuklo, talks about the study during the symposium on The Values of Philippine Flora and Fauna. (Photo from Val Zabala, DOST-NRCP)

Studying the Philippines' flora and fauna

The Codium research was among the six completed projects that were presented at the symposium on "The Values of Philippine Flora and Fauna", organized by the Department of Science and Technology-National Research Council of the Philippines (DOST-NRCP).

Dr. Irene V. Fariñas of the Department of Health (DOH), who was among the panel of reactors in the symposium, said that the DOH welcomes this potential drug discovery. This basic research on Codium as potential inhibitor of tumor growth, could possibly lead to the development of low cost alternative to commercial drugs for the treatment of cancer.

At the event's opening ceremony, DOST Undersecretary for Research and Development Dr. Rowena Cristina L. Guevara mentioned that the third wave of research is setting in. The first was when research was mostly confined to teaching research, relegated to the centers of excellence. The second was when research was peer-centric, when getting published from standard publications was the "in" thing. The third wave is now, when research is measured by its relevance to society.

"Researchers, do not be afraid to translate your work into what's good for the society," Usec. Guevara addressed the symposium participants.

She added that the Philippine biodiversity is vast and the country's local species are being studied by foreigners. "We lack researchers who can study our own biodiversity," she emphasized.

Meanwhile, Dr. Christine C. Hernandez, associate professor at the Institute of Chemistry, University of the Philippines Diliman, commended the government especially DOST-NRCP for its efforts in championing research and development. She said that the funding support from government agencies like the DOST-NRCP enables them in the academe to support the work of their students. It also enables them to encourage more of their students to work for them and hopefully to inspire them to pursue PhD degrees, she added.

Dr. Vasquez also acknowledged that current funding enabled their two graduate students to complete their graduate thesis at UST.

DOST-NRCP also funded the innovative researches presented in the symposium which are important inputs to policy development, especially in terms of sustaining and protecting the country's biodiversity. These basic researches on natural resources are vital not only to the local pharmaceutical industry, but for the country's socioeconomic development, as a whole.

"Ingenui-tea"

DOST-FPRDI experts turn tea scraps into wood glue additive

By Allyster A. Endozo, *DOST-STII*

SCIENTISTS FROM the Department of Science and Technology-Forest Products Research and Development Institute (DOST-FPRDI) have proven the usability of spent tea leaves (STL) as cheap yet reliable additive in producing plywood adhesives.

Their study was able to prove that STL can potentially serve as cheaper replacement for wheat flour when simultaneously used as extender and filler in locally-produced plywood adhesives. Moreover, the STL can effectively reduce the emission of carcinogenic substances when the STL is applied in wood-based panels for home and construction.

The researchers collected STL from a local beverage manufacturing plant, dried the leaves, milled them, and mixed with urea formaldehyde resin. The resulting glue mixture was used to fabricate triple-layer plywood panels made of falcata and native mahogany lumber, both of which are commonly found across the Philippines.

Each 5-mm thick panel was tested for its shear strength, cohesive wood failure, and formaldehyde emission. This was done to determine the effect of STL on various glue mixes in compliance with Philippine National Standard 196 and ISO 12466-1 and 12466-2 standards.

"Through this mechanical test, shear strength and wood failure parameters are measured to indicate the performance of the bond between the glued veneers in terms of strength of the bond and amount of wood fibers taken off from either of the two glued layers of veneers being tested," said Juanito P. Jimenez Jr. of DOST-FPRDI.

From trash to treasure

Nationwide, nearly 18 metric tons of STL mainly derived as by-product from the manufacture of tea-flavored drinks are thrown in landfills or compost pits every day, its ancillary use largely untapped. STL retains much of its valuable fiber and protein components even after multiple uses thus it is seen as a very important material for plywood adhesive.

In relation to this, Jimenez and his fellow researchers at DOST-FPRDI are hoping that technology that may arise based on their methodology would one day be applied for commercial-scale industrial use.

"Our paper presents the encouraging results to prove STL's potential in plywood manufacture as glue extender to replace wheat flour, as filler to replace coconut shell flour, and as formaldehyde scavenger," he said.

He cautioned, however, that the use of STL as fuel for energy has commenced as an easy disposal option.

"The challenge now is to match or outdo the revenues/savings generated as energy resource by instead utilizing STL for higher value products, like glue additive, with an extra health benefit," Jimenez said.

gopaldharaindia_com.jpg

DOST boosts Filipinnovation in entrepreneurship and inclusive growth

By Beatrice Marie S. Basi and Mark Ivan C. Roblas, *DOST-PCIEERD*
Photos from DOST-PCIEERD

FILIPINNOVATION IN ACTION. *DOST Secretary Fortunato T. de la Peña (third from left) signs the Memorandum of Understanding with partners (L-R:) DepEd Undersecretary Atty. Nepomuceno A. Malaluan, CHED Chairperson J. Prospero E. de Vera III, DTI Secretary Ramon M. Lopez, DICT Undersecretary Denis F. Villorente, and NEDA Assistant Secretary Carlos Bernardo O. Abad Santos for the implementation of the Inclusive Innovation Industrial Strategy (i3s). Serving as witnesses to the MOU signing are DOST Undersecretary for Research and Development Dr. Rowena Cristina L. Guevara (left) and DTI Assistant Secretary Rafaelita M. Aldaba (right).*

"Retailgate was just an idea."

E-commerce startup company Retailgate Chief Executive Officer Raphael T. Layosa nostalgically recalls how he was then helped by the Department of Science and Technology (DOST) to grow his idea into one of hottest startup companies in the Philippines.

"We only had the concept with us. We had a few sources. We know what we wanted to do. We know which market we can enter," he said.

Retailgate, one of the 15 startups supported by DOST-Philippine Council for Industry, Energy and Emerging Technology Research and Development (PCIEERD), is an e-commerce company which conducts customer behavior analytics using pre-installed CCTV cameras.

Layosa said the DOST-PCIEERD's support for startup companies like this enabled his idea to become a full-blown technology startup company that is now helping retailers get more value from e-commerce.

"From one concept, we now have three technologies. At first, we were only targeting retailers, but now, we have a clothing company, a major market research firm, and other major brands who want our technology," he said.

Technology startup companies in the Philippines may soon have similar successes like Retailgate as the DOST forged partnerships with various government agencies to encourage more Filipinos to venture into putting up their own businesses.

At the Inclusive Innovation Conference held in October, DOST signed two memorandums of understanding (MOUs) with the Department of Information and Communications Technology (DICT), Department of Education (DepEd), Commission on Higher Education (CHED), National Economic and Development Authority (NEDA), and Department of Agriculture to implement the Inclusive Innovation Industrial Strategy (i3s).

DOST-PCIEERD Deputy Executive Director Engr. Raul C. Sabularse said the Inclusive Innovation Centers (IIC) brought forth these collaborations as it served as a venue to discuss industrialization and address innovation challenges in the country.

"The IIC is a catalyst in empowering Filipinos to be globally innovative in developing technologies and to revolutionize business to create more opportunities for success," he said.

The MOUs cover six elements of a startup systems roadmap, namely: 1) strengthen innovation policy and commercialization; 2) position industries for rapid growth; 3) human resource development; 4) create entrepreneurial programs and support for startups; 5) provide funding and finance assistance; and 6) strong government-industry-collaboration.

The roadmap aims to enhance the collaboration between the academe, industry, and government to upgrade and develop new industries, remove obstacles to growth, and transform the economy in the new digital age.

In the coming years, these agencies will establish Regional Inclusive Innovation Centers (RIIC) in NCR, CALABARZON,

Cebu, and Bicol. These RIICs will be the cornerstone of the i3s initiative, and will lie at the heart of economic transformation.

The roadmap puts the Philippines in a better position to leapfrog to industrialization in the new digital age, surely spurring progress into the lives of Filipinos.

Also highlighting the event is the signing of an MOU among DOST, Department of Trade and Industry, and DICT for the establishment of the Startup Systems Program 2019-2023, a five-year roadmap for the sustainable growth of the Philippine startup ecosystem. Through this, the three government agencies will promote and support startups through their programs, events, and projects.

Dr. Sabularse said DOST supports startups through the following initiatives: 1) Technology Business Incubation Program; 2) Program to capacitate technology transfer officers; 3) Higher Education Institution Readiness for Innovation and Technopreneurship Program; 4) TECHNICOM for the refinement of technologies; 5) Small Enterprises Technology Upgrading Program (or SETUP); 6) One-stop Shop Laboratory for Global Competitiveness (or OneLab) for product testing; and 7) Startup Research Grant.

On the second day of the conference, the Slingshot Startup and Innovation Summit highlighted notable startups and government-funded researches and technologies such as the first Filipino-made environment-friendly Hybrid Train Set and Hybrid Electric Train, as these partly run on electricity; Antipara Exploration's underwater-towed platform sonar systems for 3D underwater maps and analytics; Fish-i, a technology for rapid reef fish assessment; Universal Structural Health Evaluation and Recording System, a weather and theft-proof system that enables the monitoring of the structural soundness of buildings and bridges; and the Versatile Instrumentation System for Science Education and Research, an affordable instrumentation system which students can use for their laboratory experiments.

DOST Secretary Fortunato T. de la Peña (second from left) with (L-R:) DOST Undersecretary for Research and Development Dr. Rowena Cristina L. Guevara, DTI Secretary Ramon M. Lopez, and DTI Undersecretary Nora K. Terrado at the ceremonial MOU signing to boost PH startups.

Tech transfer experts share best practices, policy recommendations at forum

By Emilie S. Capellan, *DOST-TAPI*
Photos from DOST-TAPI

Resource speakers discuss pertinent issues regarding technology transfer and commercialization during the 2018 Technology Transfer Forum held on 16 October 2018 at the Shangr-La's Mactan Resort and Spa, Cebu in Lapu-Lapu City, Cebu.

Technology transfer experts from various countries tackled the issues surrounding technology transfer at one of the side forums held in conjunction with the Philippines' hosting of the Association of Southeast Asian Nations (ASEAN) Science Ministers meeting on 15 to 19 October 2018.

Topics discussed in the forum included issues and concerns on technology transfer and commercialization, technology matching, as well as best practices from participating nations.

Resource persons shared significant insights on bringing technologies in the market, planning innovative strategies in technology adoption, and overcoming different challenges relating to technology transfer and commercialization.

One of the speakers was Eugene Wee, senior vice president of Exploit Technologies Private Limited of Singapore, who discussed how technology transfer has played a key role in Singapore's economic development for the past years.

"Singapore's economy evolved from a labor-intensive economy to a knowledge-intensive one," said Wee.

"The most important considerations to keep in mind in successfully bringing a technology to the market is understanding what the problem is, what are the needs of the industry, and developing the solutions as part of the research and development (R&D) framework to the problems," he added.

Meanwhile, Dr.Viraj Perera, chief executive officer of PlaTCOM Ventures of Malaysia explained the factors that affect technology transfer and commercialization.

"The most successful technology transfer and commercialization platforms worldwide have thoroughly addressed policy, awareness, talent pool, metrics and measurements, and other elements that can affect such processes," said Perera.

Another speaker, Dr. Danilo B. Largo, director of Research, Development, Extension, and Publications Office and Manager of the Innovation and Technology Support Office of Cebu's University of San Carlos, shared what he thinks is a major challenge in technology transfer and commercialization.

"The major challenge in technology transfer and commercialization is the intellectual property disclosure by the

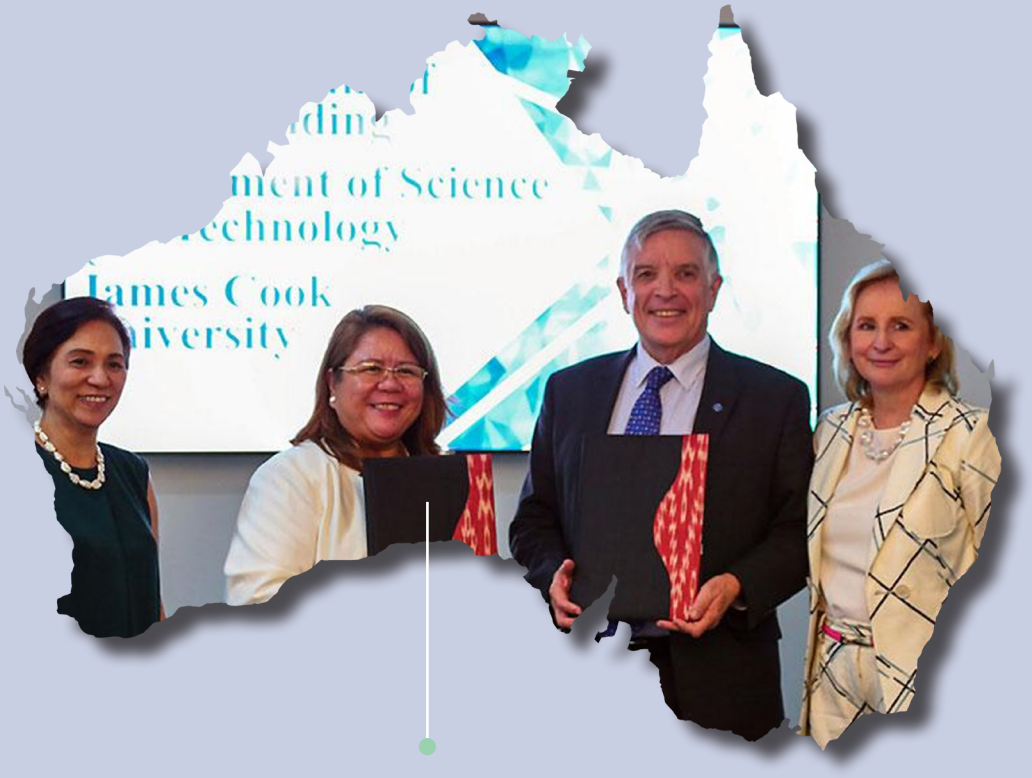
researchers which may be important to be shared for the benefit of society," said Largo.

Aside from serving as a venue for technical experts, researchers, and policy makers to share their best practices and ideas for future collaborations, the forum also paved the way for the creation of policy recommendations on technology transfer in the ASEAN region.

A total of 73 participants attended the forum composed of representatives from Myanmar, Indonesia, Thailand, Singapore, Lao People's Democratic Republic, and Finland. Technology transfer officers from various DOST R&D institutes and councils, as well as researchers from other government and private organizations participated in the forum.

The Technology Transfer Forum, organized by the Department of Science and Technology-Technology Application and Promotion Institute, was held at the Shangri-La's Mactan Resort and Spa, Cebu in Lapu-Lapu City, Cebu on 16 October 2018.

(From left) Dr. Ruby R. Cristobal, division chief of DOST-Science Education Institute's S&T Manpower Education Research and Promotion Division, Dr. Viraj Perera, Dr. Danilo B. Largo, Eugene Wee, and DOST-Technology Application and Promotion Institute Director Edgar I. Garcia during the 2018 Technology Transfer Forum.



(L-R): DOST Assistant Secretary for International Cooperation Leah J. Buendia, DOST Undersecretary for Research and Development Dr. Rowena Cristina L. Guevara, JCU Chancellor Bill Tweddell, and Australian Ambassador Amanda Gorely at the MOU signing ceremony. (Photo from DOST-ITCU)

DOST finds a partner down under

By Louie C. Intalan, *DOST-ITCU*

The Philippines and Australia hope to strengthen their ties anew through a collaboration between the Department of Science and Technology (DOST) and Australia's James Cook University (JCU).

DOST and JCU inked a Memorandum of Understanding for scientific and technological collaboration on 27 November 2018 at the Philippine Science High School.

The two institutions will cooperate on marine science, natural resource management, and tropical health research. The agreement includes the exchange of scientists, specialists, and students, along with capacity building initiatives, and training and career development for researchers and the professional workforce.

DOST Undersecretary for Research and Development Dr. Rowena Cristina L. Guevara comments that JCU's leadership in tropical studies will further the Department's efforts in developing scientific and educational alliances that are relevant and unique to the tropics.

JCU is ranked first in the world for marine biology and ranked second in the world for biodiversity conservation research by the Centre for World University Rankings.

JCU Chancellor and former Australian Ambassador to the Philippines Bill Tweddell signed the partnership document in behalf of JCU. Australian Ambassador Amanda Gorely also graced the signing ceremony and said that the partnership will strengthen the Philippine-Australia ties and increase people-to-people connectivity between the two institutions.

Int'l confab underscores contributions of nuclear S&T

By Karen Lou S. Mabagos and Louie C. Intalan, *DOST-ITCU*

Sec. dela Peña addresses the international community on the peaceful use of nuclear science and technology, which he believes has a great potential to flourish in the country. (Photo from DOST-ITCU)

The Philippines, through the Department of Science and Technology (DOST), was among the 137 member states of the International Atomic Energy Agency (IAEA) that participated in the Ministerial Conference on Nuclear Science and Technology held on 28 to 30 November 2018 in Vienna, Austria.

With the theme "Addressing Current and Emerging Development Challenges", the conference underscored the contribution of nuclear science and technology to meeting global socioeconomic needs.

Among the main commitments agreed upon in the conference were the promotion of wider nuclear technology applications for national development priorities and the realization of the 2030 Agenda for Sustainable Development.

Secretary Fortunato T. de la Peña delivered the Philippine statement at the plenary, assuring the IAEA of the country's support and commending its assistance to developing member states through the Technical Cooperation Program.

The Philippine-IAEA partnership, which began in 1958, continuously develops the Philippines' human resources by training Filipino scientists and experts on recent nuclear technology applications.

At the sidelines of the event, DOST staged an exhibit to showcase the country's achievements in the application of nuclear technology. It featured the Filipino innovation carrageenan plant food supplement—irradiated seaweeds that can boost the yield of crops and increase its typhoon resistance.

Nuclear science and technology has a great potential to flourish in the country, especially with its multiple applications in sectors such as health, agriculture, industry, and climate change.

Particularly, DOST is keen on pursuing and strengthening initiatives on health and nuclear medicine with emphasis on diagnosis and treatment of diseases. This is being carried out by the DOST-Philippine Nuclear Research Institute, in cooperation with other agencies.

IBM volunteer Dmitry Kleymenov presents their output for DOST-STII entitled "Establishing Scalable Systems for STARBOOKS". Seated at the back are (from left to right) Maria Williams, Malwina Bajsarowicz, Christine Ma, and Ronda Marshall.

DOST Sec. de la Peña thanks the volunteers who shared their technical expertise to further DOST's systems and services.

DOST ties up with IBM, US Peace Corps to improve systems, services

By Jasmin Joyce P. Sevilla, *DOST-STII*
Photos by Gerardo G. Palad, *DOST-STII*

Fourteen international volunteers from IBM-Philippines and two representatives from the United States (U.S.) Peace Corps provided free technical consultation and services to three agencies of the Department of Science and Technology (DOST) to help them improve their systems and services.

Under this collaboration which started on 1 October 2018, five IBM volunteers were deployed to the DOST-Central Office (CO), six volunteers to the DOST-Food and Nutrition Research Institute (FNRI), and three volunteers to the DOST-Science and Technology Information Institute (STII). The two U.S. Peace Corps volunteers were each assigned to DOST-CO and DOST-FNRI.

Before completing their four-week stay in the country, the IBM volunteers presented their outputs to DOST Secretary Fortunato T. de la Peña, Undersecretary for Scientific and Technical Services Dr. Carol M. Yorobe, Undersecretary for Disaster Risk Reduction and Climate Change and also DOST-PHIVOLCS Officer-in-charge Dr. Renato U. Solidum Jr., and Country General Manager of IBM-Philippines Aileen Judan-Jiao.

"We simply would not miss this opportunity of collaborating with these organizations [IBM and US Peace Corps] for us to advance our technical and managerial skills here at the DOST," Usec. Yorobe said during the presentation on 24 October 2018 at the DOST-Philippine Institute of Volcanology and Seismology (PHIVOLCS) Auditorium in Quezon City.

First to report their outputs were Dmitry Kleymenov and

DOST Sec. de la Peña (seated, third from right) with (seated, L-R) IBM-Philippines Corporate Citizen Manager Andrea E. Escalona, DOST-FNRI Dir. Capanzana, DOST Planning Director Maridon A. Sahagun, Usec. Yorobe, IBM-Philippines Country General Manager Aileen Judan-Jiao, Usec. Solidum, and DOST-STII Dir. Burgos join the rest of the IBM volunteers and US Peace Corps during the output presentation.

Malwina Bajsarowicz, two of the IBM volunteers assigned at the DOST-STII, who highlighted the use of cloud storage as well as active geographical expansion or geo expansion to help the Institute in establishing scalable systems for STARBOOKS or the Science and Technology Academic and Research-Based Openly Operated Kiosks.

Meanwhile, IBM volunteers assigned at the DOST-FNRI, Ronda Marshall, Jeremy O'Marc, and Mary Aldridge, shared their presentation "IT Security and Business Continuity Management Planning." According to them, process and technology improvement as well as the development of an online hub system will be of great use to DOST-FNRI especially on their data collection through survey since they rely heavily on data from nationwide surveys for their food and nutrition researches.

Lastly, Ashley Somerville, Samuel M. Jawahomal, and Christine Ma, three of the IBM volunteers assigned at the DOST-CO presented their project output on "Strengthening the Knowledge Management (KM) Systems and Policies for Department of Science and Technology". According to Ma, there are three important sectors in a KM system: people, process, and technology. In the case of DOST-CO, Ma emphasized that a people-focused KM system for DOST would be more applicable for the Department to improve its overall processes.

"DOST creates its outputs for the benefit of the Filipino citizens which resonates to the very reason why it drove us to focus their KM system on people," Ma explained.

Grateful for the collaboration

The three leaders of the DOST agencies involved in the said collaboration were more than grateful for the opportunity. DOST-STII Director Richard P. Burgos shared how they appreciated the assistance that the IBM volunteers provided to help them improve STARBOOKS.

"The collaboration between these organizations gave us the opportunity to work with different cultures in order to produce the best possible solutions," Dir. Burgos said.

Likewise, DOST-FNRI Director Dr. Mario V. Capanzana said that they could not be any more grateful for their help. "We have seen the IBM volunteers work day and night just to help us create and improve our online hub system," he said.

Dir. Maridon A. Sahagun of the DOST Planning and Evaluation Services, also expressed her gratitude towards the volunteers. "The KM system that they have proposed to the institute will be a huge help for us to deliver our services better to the Filipino people," she said.

The services rendered by the IBM volunteers ended on 26 October 2018, while the U.S. Peace Corps volunteers will be serving from August 2018 to February 2019.

The collaboration among the three organizations began in March 2018 when Usec. Yorobe met with representatives from IBM-Philippines, Australia Business Volunteer (ABV), and the U.S. Peace Corps who all introduced their volunteer or corporate service corps program. ABV is IBM's partner in delivering its IBM Corporate Service Corps Program since 2008. Recognizing DOST as a strategic agency driving innovation in the country, these three organizations expressed their interest for a partnership since the focus of deployment for 2018 is also on innovation.

As of 2018, DOST was the 19th organization in the Philippines assisted by the IBM team coming from six countries: Australia, Brazil, India, Poland, Russia, and the U.S.

Prior to this partnership, three other DOST agencies have already participated in this program: DOST-Advanced Science and Technology Institute in 2016, and DOST-PHIVOLCS and DOST-Philippine Atmospheric, Geophysical and Astronomical Services Administration in 2017.

A handshake to regional cooperation. *DOST Sec. de la Peña (fifth from right) meets with ASEAN ministers to discuss STI initiatives in the region. (Photo from DOST-ITCU)*

PH hosts ASEAN Science Ministers Meeting

By Louie C. Intalan, *DOST-ITCU*

The Philippines, through the Department of Science and Technology, played host to the ministers of the Association of Southeast Asian Nations (ASEAN) for the 10th Informal ASEAN Ministerial Meeting on Science and Technology held on 15 to 19 October 2018 in Cebu.

DOST Secretary Fortunato T. dela Peña welcomed science leaders and other key dialogue partners in the region, including representatives from the United States, European Union, and Japan.

The participants to the ministerial meeting had a series of discussions about enhancing cooperation and harmonizing strategies in the development of science, technology, and innovation (STI) and its deployment for sustainable growth.

During the five-day event, various initiatives took place, including the ASEAN ethics meeting, technology transfer forum, workshop on intellectual property, workshop on startup innovation, young leaders forum, as well as other technical sub-committee meetings.

Projects and programs aimed to stimulate STI in ASEAN were also approved in the meeting.

DOST Undersecretary for Research and Development Dr. Rowena Cristina L. Guevara, also chair of the ASEAN Committee on Science and Technology, is optimistic that with ASEAN's STI plan of action, member states will continue to strengthen synergy among the academe, research institutions, and private sector for tech transfer and commercialization—a key driver of growth for the 651 million people in the region.

DOST-TAPI, PSHS train trainors to develop future inventors

By Maricon R. Avila, *DOST-TAPI*
Photos from DOST-TAPI

PSHS students present their idea in one of the workshops.

A total of 33 campus directors, faculty members, and students from various Philippine Science High School (PSHS) campuses participated in a training of trainors for the Invent School Program (ISP) of the Department of Science and Technology-Technology Application and Promotion Institute (DOST-TAPI).

ISP is one of the leading programs of DOST-TAPI and is designed to inspire students to become future inventors. It is being offered to high school and college students to create awareness on intellectual property rights, prototype development, and commercialization of inventions, among others.

The event called "Capacity Building for the Philippine Science High School for the Invent School Implementation" was held on 18 to 19 October 2018 in Iloilo City in coordination with PSHS and DOST-Region VI.

The two-day training-workshop was handled by speakers from various fields, including Engr. Maria Concepcion S. Zabala of the Intellectual Property Office of the Philippines who discussed the importance of intellectual property rights and prior art search, Rommel Adame of the DOST-Metals Industry Research and Development Center on the significance of prototyping, and Chona Suner-Narvadez of the Philippine Rice Research Institute on the necessity of considering the target market of a technology in terms of commercialization.

Both DOST-TAPI Director Edgar I. Garcia and PSHS Executive Director Lilia T. Habacon inspired the student participants with their respective talks about the program. Meanwhile DOST-VI Regional Director Rowen R. Gelonga discussed the research and development map of the country and the significance of science, technology, and innovation in economic and social progress as key drivers for the long-term growth of an economy.

"DOST is the mother agency to support growth and innovation in the country. As part of the agency, it is our obligation to engage in innovative works," said Dir. Habacon.

DOST-TAPI's in-house experts served as the facilitators of the training composed of Caezar Angelito E. Arceo, supervising science research specialist (SRS), Anna Liza B. Saet, ISP program manager, and Engr. Roberto B. Verzosa, senior SRS.

Atty. Marion Ivy D. Decena, chief SRS of DOST-TAPI's Invention Development Division, emphasized that the event is just a glimpse of how DOST-TAPI conducts the ISP. "After you go back to your campuses as future trainors, you are expected to do an apprenticeship program wherein you will be paired with our experts from DOST-TAPI and other agencies to conduct Invent School activity," she said during her closing remarks.

The participants were from the PSHS campuses of the National Capital Region; Caraga; South Central Mindanao; Eastern, Western and Central Visayas; Zamboanga; and SOCCSKSARGEN.

Faculty members busy working on their "prototypes" during one of the workshops. (Photo from DOST-TAPI)

Photo from DOST-PCIEERD

Interagency collab targets to boost tech start-ups

By Raissa Jean A. Ancheta, *DOST-PCIEERD*

In a bid to strengthen government's support to technology startups in the Philippines, the Department of Science and Technology (DOST), the Department of Information and Communications Technology (DICT), and the Department of Trade and Industry (DTI) entered into a mutual agreement that will synergize their assistance in support of the growth and development of startups.

At the Second National Technology Business Incubation Summit held in Manila, DOST Secretary Fortunato T. dela Peña, DICT Acting Secretary Eliseo M. Rio Jr., and DTI Secretary Ramon M. Lopez signed a Memorandum of Understanding (MOU) that lays the ground for a five-year roadmap for technology business incubation in the country.

Recognizing the different efforts of DOST, DTI, and DICT to nurture technology business incubators (TBIs) in the country, the MOU binds the three departments to harness their programs and projects in putting up a conducive business ecosystem for startups.

"The parties commit to come up with projects, events, and/or endeavors by way of tie-ups, joint program activities, or cost matching to be reflected in their future MOAs (memorandums of agreement) to succeeding activities and events that will promote and assist Philippine startups," the MOU reads.

At present, the DOST, DTI, and DICT implement a variety of programs for startups in the country. DICT, through the ICT Industry Development Bureau, implements the SeedPH program that aims to boost the ICT ecosystem in the countryside. The program also advocates for the promotion and development of local ICT startup businesses throughout the country.

On the other hand, DTI, through the Startup Ecosystem Development, provides means for startups to scale up by giving them opportunities to participate in outbound business missions and international pitching competitions.

Meanwhile, DOST, through the Philippine Council for Industry, Energy and Emerging Technology Research and Development (PCIEERD), provides financial assistance to

TBIs. At present, the DOST-PCIEERD implements the following programs: TBI Establishment Assistance, Higher Education Institution Readiness for Innovation and Technopreneurship (HEIRIT), and TBI 4.0 programs.

The TBI Establishment Assistance program helps higher education institutions (HEIs) and state universities and colleges (SUCs) to jumpstart a TBI. The assistance covers the first two years of operation cost for the TBI.

HEIRIT, on the other hand, is a preparatory program for HEIs and SUCs interested in establishing a TBI. The program is implemented in partnership with the University of the Philippines National Engineering Center.

While TBI 4.0, which aims to enhance or elevate the capabilities of existing TBIs (e.g., from first generation to second generation, second generation to third generation, etc.), co-develops programs with local and/or international accelerators and co-incubates with senior international or local partners to expand their reach to an international level.

DOST-PCIEERD Deputy Executive Director Engr. Raul C. Sabularse expressed optimism for the TBI community with the signing of the MOU.

"The bonds we built today with the signing of the Memorandum of Understanding among DTI, DICT, and DOST strengthens our resolve to be responsive to the industry's needs," he said. We believe that TBIs provide a unique opportunity for economic growth in the country and its development, and will mean better lives for our people," he said.

DOST's TBI Program, spearheaded by DOST-PCIEERD, aims to promote innovation and technopreneurship for the country's socioeconomic development in a knowledge-based world economy. It hosts startups and offers business development services, office space, as well as technical facilities to help establish businesses.

Engr. Sabularse said that DOST-PCIEERD remains unwavering in its commitment to nurture the technology startup industry in the country and be at the forefront of providing a conducive environment for it to flourish.

"We at DOST-PCIEERD will continue to listen to you and provide you a space to be heard and recognized. We believe that with all hands on deck, we can turn the gears of innovation and put forward the startup ecosystem in the Philippines," he said.

Prof. Hadi Purwadaria, project coordinator of the ASEAN-JAIF Project Promoting SME from Indonesia, provides insights and examples of the set-up of Indonesian TBIs, as well as examples of products being offered by the startups housed in the various TBIs in their network.
(Photo and text by Christian Zamora, DOST-PCIEERD)

Agri tech innovations highlight DOST-IX S&T fair

Text and photos by Rodolfo P. de Guzman, *DOST-STII*

ROBOTICS BY PISAY STUDENTS. *Dr. Carol M. Yorobe (left), undersecretary for S&T Services of the Department of Science and Technology (DOST) listens intently to the explanation of students from the Philippine Science High School-Dipolog Campus (Zamboanga del Norte) on robotics using computerized mechanics and sensors for certain functions and repetitive tasks that can be applied in manufacturing. This is part of the exhibit during the celebration of the RSTW in Region IX (Zamboanga Peninsula).*

Innovation is no longer just a buzz word but a reality in Zamboanga Peninsula as the Department of Science and Technology-Region IX (DOST-IX) showcased the latest science and technology (S&T) innovations in agriculture, enterprise development, and disaster preparedness.

Banking on this year's National Science and Technology theme of "Science for the People: Innovation for Collective Prosperity", DOST-IX led by Director Martin A. Wee kicked off its celebration of the Regional Science and Technology Week (RSTW) with the opening of the exhibits at the Amusement and Events Center, Provincial Capitol Compound in Pagadian City, Zamboanga del Sur. The celebration was held from 5 to 7 November 2018.

DOST Secretary Fortunato T. de la Peña bannered the many research and development (R&D) projects and innovative technologies developed by the department in the fields of agriculture, aquaculture, food technology, disaster risk reduction through deployment of weather monitoring instruments, industry and mass transport solutions, education and scholarship, health and drug discovery, and community empowerment.

"Because the Zamboanga Peninsula is basically an agricultural economy, the DOST through its regional office, has introduced many innovations and inventions that will help farmers improve their productivity," said Sec. de la Peña. The science chief mentioned among others the ZamPen native chicken, an improved breed of the native chicken found in the region that can generate 20 to 40 percent increase in egg production.

The ZamPen native chicken is a joint project of the Western Mindanao State University and San Ramon Prison and Penal Farm (SRPPF) that provided alternative sustainable livelihood to rural communities in the Zamboanga Peninsula.

As one of the flagship projects in the region, ZamPen native chicken was developed by the

RSTW ZAMBOANGA

DOST-Philippine Council for Agriculture, Aquaculture and Natural Resources Research and Development to be more profitable by 26 percent on hardened chicks and 86 percent on slaughtered chicken.

Moreover, ZamPen chicken has 80 percent fertility and hatchability and 90 percent survival rate. The chicken was raised with supplemental feeding of 50 percent local feeds produced by the inmates of SRPPF in Zamboanga City.

"DOST also looks at different opportunities in the region to maximize the use of its resources for the benefit of the people," said Sec. de la Peña. "We do this by matching locally developed technologies that can help create livelihood for our marginalized communities like the processing of unproductive or senile rubberwood trees," he disclosed.

During the opening day, DOST-IX also launched the project on "Processing and Utilization of Senile and Unproductive Rubberwood Trees for High Value Furniture, Mouldings, and Joineries" in Naga, Zamboanga Sibugay.

With the new technology, DOST-IX hopes to boost the local furniture industry to be more sustainable and environment friendly. Further, this will provide alternative livelihood for rubber tree farmers to shift to other viable enterprises utilizing would-be agricultural wastes.

The processing of senile rubberwood is a three-year PhP 57 million project of the DOST-IX, DOST-Forest Products Research and Development Institute (FPRDI); the local government of Naga, Zamboanga Sibugay; the Tambanan Agrarian Reform Beneficiaries Multipurpose Cooperative (TARBEMCO), and other stakeholders.

Also, during the event, the DOST-IX launched the AleRTO mobile app for early warning system on disaster preparedness. The program is in collaboration with the Ateneo de Zamboanga, local government units of Zamboanga del Sur, and other government agencies and stakeholders.

The RSTW celebration also highlighted various S&T activities that include: technical sessions on DOST's major programs and services, forum on intellectual property rights, forum on disaster risk reduction and preparedness, techno-demo on corn products processing, the regional elimination of the Philippine Nuclear Science Quiz, exhibits of different DOST attached agencies, and product bazaar composed of innovative food products of proponents of DOST's Small Enterprise Technology Upgrading Program.

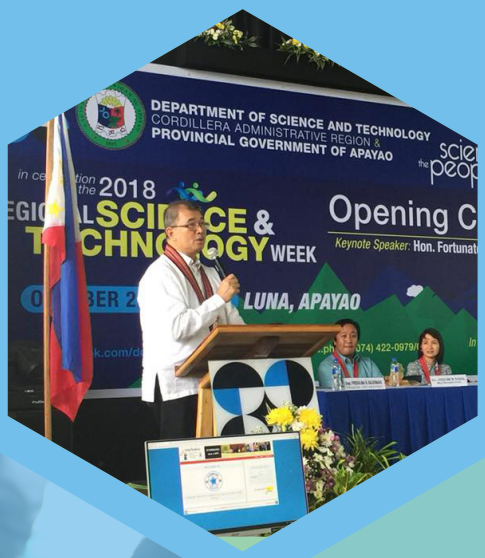
The opening ceremony was also attended by top DOST officials namely, DOST Undersecretary for S&T Services Dr. Carol M. Yorobe, DOST Undersecretary for Disaster Risk Reduction and Climate Change Dr. Renato U. Solidum Jr, and DOST-FPRDI Director Romulo T. Aggangan. Also in attendance were Governor Antonio C. Cerilles of Zamboanga del Sur and Councilor Adriano B. Durano III who represented Pagadian City Mayor Romeo P. Pulmones.

Region IX is composed of three provinces, namely Zamboanga del Sur, Zamboanga del Norte, and Zamboanga Sibugay, all of which were represented at the RSTW celebration by their respective Provincial S&T Center directors of the DOST.

SENILE RUBBERWOOD PROCESSING FACILITY.
Shown in photo during the blessing of the facility were DOST Secretary Fortunato T. de la Peña (middle) with (L-R) Fr. Francisco G. Baguio of the Holy Family Parish in Naga; Petronilo G. Licudan, chair of TARBEMCO; DOST-FPRDI Director Romulo T. Aggangan; and DOST Undersecretary for S&T Services Dr. Carol M. Yorobe. The launch was part of the RSTW celebration held from 5 to 7 November 2018 at the Provincial Capitol Compound, Pagadian City, Zamboanga del Sur.

DOST, LGU team up to provide jobs, boost ecotourism in Apayao

By Allan Mauro V. Marfal, *DOST-STII*
Photos by Kimverlyn C. Sayson, *DOST-STII*



DOST Secretary Fortunato T. de la Peña delivers his keynote message during the opening of the 2018 Cordillera RSTW on 22 October 2018 at the Elias C. Bulut Multi-Purpose Gymnasium in Luna, Apayao.

RSTW APAYAO

The landlocked province of Apayao in the Cordillera Administrative Region (CAR) was the center of activities and the focus of discussions at the recent celebration of the 2018 Regional Science and Technology Week (RSTW) for the region. The discussions revolved mainly on how science and technology (S&T) services, researches, and innovation could aid in the province's socioeconomic development.

In collaboration with the local government unit, the Department of Science and Technology (DOST) bared how science, technology, and innovation could help bring inclusive development in Apayao.

Bordered by the provinces of Cagayan, Abra, Ilocos Norte, and Kalinga, the province of Apayao has natural resources and raw materials that could be valuable assets in creating jobs and livelihood opportunities for its residents.

Rebecca T. Mamba, Apayao's tourism officer affirmed that the province is truly rich in natural resources, especially caves and waterfalls that are unexplored, which can be used to promote ecotourism. Mamba also shared that Apayao has an abundance of raw materials as they harvest pineapple, cassava, corn, coffee, rice, and vegetables—some of which are turned into *pasalubong* items for tourists' consumption.

However, the lack of technology and the lack of proper knowledge among the people on how to maximize the province's natural resources serve as roadblocks in delivering inclusive development to the province of Apayao.

"We are very glad to bring to the people of Apayao all the services of the DOST line agencies and its supported firms," said DOST Secretary Fortunato T. de la Peña at the opening of the 2018 RSTW for the Cordillera region on 22 October 2018.

"Every time we conduct our S&T fair in the region, our goal is to equip the locals with better knowledge and understanding on how existing S&T services and researches could offer timely solutions and assistance in the areas of agriculture, education, health, and business enterprises," Sec. de la Peña said.

The science chief further said that an event like the RSTW could allow the DOST to assess the kind of support that the Department could give and focus on in a particular area.

"For example, in terms of tourism, the province of Apayao has a big potential in attracting tourists. We just have to establish the market and your products will surely market your province," said the Secretary.

He also shared that Apayao has 286,000 hectares of virgin forests which can help in developing medicines. Aside from that, the DOST chief also believes that Apayao's hidden wealth is their total land area of 441,335 hectares, much of which is used as farmlands.

LGU and DOST partnership

Apayao Governor Elias C. Bulut Jr. said that bringing this year's RSTW to Apayao is very timely as the provincial government is also looking forward to DOST's support in their programs and initiatives that can help the province in their development programs, particularly in the area of agriculture.

Aside from that, Governor Bulut also shared that the provincial government is now working on its tourism development plan which calls for stronger support and partnership with the DOST.

In response, Secretary de la Peña mentioned that DOST can help through their Small Enterprise Technology Upgrading Program or SETUP, S&T scholarships, and funding of the research and development projects of different colleges and universities.

According to DOST-CAR Regional Director Nancy R. Bantog, from 2002 to 2018, there were 61 local businesses in Apayao that availed of the financial and technical assistance under SETUP to improve the quality of their products and services.

"Most of the businesses in Apayao are from the food manufacturing sector, so that the role of SETUP in the province is very crucial, especially if we want to promote and market different delicacies here," said Dir. Bantog.

She further explained that a local business assisted by SETUP can acquire machines that would help increase the volume of its products and speed up its production.

"SETUP would allow local entrepreneurs to grow its businesses," Dir. Bantog said. "This means it would generate more revenue to the province and more job opportunities for the locals," she explained.

On the other hand, Sec. de la Peña also shared the efforts of DOST in strengthening the S&T human resources in Apayao through scholarships and deployment of information materials in different elementary and secondary schools.

According to the DOST-CAR, there are currently 12 undergraduate scholars and four scholars under the Junior Level Science Scholarship program in Apayao.

Sec. de la Peña also shared the report of the Department of Education, wherein the number of students who are taking up science, technology, engineering, and mathematics tracks in senior high school has significantly increased to 60 percent.

"We see our scholarship program as building blocks to bring inclusive growth in the provinces by producing future engineers and scientists who would provide innovative solutions to the pressing problems in their areas," said Sec. de la Peña.

To further inspire students to take up S&T related courses, the DOST has also deployed 25 STARBOOKS units in different public schools in Apayao.

STARBOOKS, short for Science and Technology Academic and Research-Based Openly Operated Kiosks, is a stand-alone digital science library that contains tons of international and local journals, articles and videos on various disciplines such as science, mathematics, enterprise technology, and disaster risk reduction and management. All of the contents of STARBOOKS can be accessed even without internet connection.

Also featured in the 2018 RSTW for CAR are various activities that include an exhibit, trade fair, career talk, SETUP Forum, robotic exhibition and contest, science journalism writeshop, and project visits to different SETUP-assisted firms in Apayao.

The 2018 RSTW for the Cordillera Administrative Region was held at the Elias C. Bulut Multi-Purpose Gymnasium in Luna, Apayao on 22 to 25 October 2018.

DOST Secretary Fortunato T. de la Peña visits VFM Food Products, one of the best SETUP adoptors and producer of tasty Cassava and Carrot Cake in Sta. Marcela, Apayao.

High school students from Apayao enjoy the robotic activities held during the third day of the 2018 Cordillera RSTW.

ICYMI: Top five happenings at DOST-CALABARZON's RSTW 2018

By Demee S. Ludia and Myrrh L. Gutierrez, *DOST-CALABARZON*
Photos from DOST-CALABARZON

Editor's note: ICYMI is short for "in case you missed it", usually used in social media posts to talk about something that happened recently.

Staying true to its commitment to bring science closer to the people, the Department of Science and Technology-CALABARZON (DOST-CALABARZON) brought its Regional Science and Technology Week (RSTW) 2018 all the way to Quezon Convention Center in Lucena City, Quezon and at the University of Rizal System-Antipolo Campus in Antipolo, Rizal.

The three-day activity, held on 12 to 14 November 2018, was jampacked with launchings, fora, and interactive exhibits.

Here are the five most exciting things that happened during the 2018 DOST-CALABARZON RSTW.

Jam-packed opening ceremony

What better way to open the region's biggest annual science and technology event than by showcasing DOST-CALABARZON's programs and services.

First was the launching of the region's newest communication-related initiatives. Dr. Alexander R. Madrigal, regional director of DOST-CALABARZON, spearheaded the launch of their brand book and institutional video. This is in commemoration of the celebration of DOST-CALABARZON'S 55th anniversary.

This was followed by the launching of the Data-Analytics Ready Information Unified System or Project DARIUS. To mark the program's launch, regional directors from all over the Philippines were asked to ink their signatures of commitment.

RSTW QUEZON

Next was the ceremonial handover and memorandum of agreement signing for the Tsunami Detection and Early Warning System (TeWS) project. The municipalities of Panukulan, Jomalig, and Calauag in Quezon were each given a replica of the TeWS equipment to signify the presence of the disaster risk reduction management (DRRM) equipment in their respective municipalities. Meanwhile, the municipalities of Infanta, Burdeos, and Atimonan, also in Quezon, signed an agreement for the said local government units (LGUs) to have TeWS equipment in their areas in the near future.

Following the handover ceremony for TeWS was the launching of *makapuno* products like hand creams, massage creams, lotions, and exfoliating soaps. During the products launch, DOST-CALABARZON and QTR Pharma Sciences, Inc. formalized their commitment to license/adopt *makapuno* processing technologies and work together in commercializing the newly introduced *makapuno* products.

To cap off the opening ceremony, the region's best micro, small, and medium enterprises (MSMEs) were also recognized for their stellar performance and were named the region's "Best SETUP adoptors" and "Best community-based projects for 2018." The awardees were as follows:

Best SETUP Adoptors for 2018:

- ***Province of Cavite*** - Noceda Bakery Plus
- ***Province of Laguna*** - Cocoplus Aquarian Development Corp.
- ***Province of Batangas*** - Mira's Turmeric Products
- ***Province of Rizal*** - Jamerika Enterprise Inc.
- ***Province of Quezon*** – Pasciolco Agriventures

Best Community-based Projects for 2018:

- ***Province of Cavite*** - Palangue Agrarian Reform Cooperative
- ***Province of Laguna*** - Calamba Upland Farmers Multi-Purpose Cooperative
- ***Province of Batangas*** - Kabuhayan para sa may Kapansanan Inc. of Cuenca Batangas
- ***Province of Rizal*** - Cordona Multi-Purpose Cooperative
- ***Province of Quezon*** – Agos ng Pag-asa Multi-purpose Cooperative

The opening ceremonies were made even more special because of the presence of DOST officials led by Secretary Fortunato T. de la Peña, Undersecretary for Scientific and Technical Services Dr. Carol M. Yorobe, Undersecretary for Research and Development Dr. Rowena Cristina L. Guevara, Undersecretary for Regional Operations Dr. Brenda L. Nazareth-Manzano, and Assistant Secretary for Administration Dr. Teodoro M. Gatchalian. The event was also graced by DOST regional directors from different parts of the country.

Two new buildings housing DOST-CALABARZON's newest laboratories

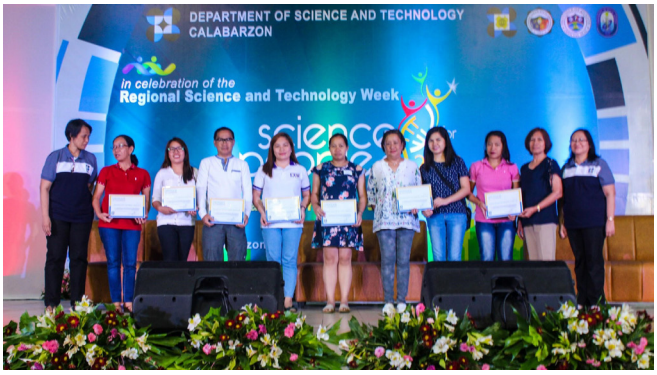


The Provincial Science and Technology Centers (PSTCs) of Quezon and Rizal were transferred to a more innovative and work conducive offices. Housed in these new buildings are the Center for Hazard and Environmental Resource Mapping laboratory and the Regional Design and Creativity Hub for Innovation in MSMEs and Education (RDCHIME) laboratory, respectively.

People-centered fora

• Commodity-based processing towards sustainable communities

The Community Empowerment through Science and Technology is a program of the DOST designed to help uplift communities through science and technology. Products based on nipa, cacao, banana, and *makapuno* were the focus of discussions in the said forum.



• Awareness on Halal food and products

As one of the agency's emerging flagship programs, DOST-CALABARZON has been putting efforts into strengthening and promoting the Halal industry in the country in support of Republic Act 10817 or the "Philippine Halal Export Development and Promotion Act". Different MSMEs were invited to partake in this forum.

• Bridging MSMEs towards industrialization through automation

The Small Enterprise Technology Upgrading Program (SETUP) is DOST's pioneer program that helps MSMEs. The SETUP forum aimed to promote its enhanced version—SETUP 2.0. Topics on levelling up productivity and innovation services of the ideation, development, and design laboratories were also discussed.

• Hazard and environmental resource mapping

To formally inaugurate PSTC Quezon's newest building and laboratory, a forum was conducted to help establish its presence in the region. LGU officials, particularly those who are working in the field of DRRM participated in the symposium.

• Design and creativity innovation in MSMEs and education

Likewise, the province of Rizal also welcomed its new PSTC building and laboratory with a forum. Invited attendees were different MSMEs in the province of Rizal and various higher education institutions in the region.

Interactive booths

Kids and kids at heart enjoyed the interactive booths that served as both entertainment and learning attractions for visitors. Some of the featured exhibits were the following:

• Mobile Planetarium

Visitors were given the chance to "experience" the outer space in this interactive exhibit.

• Quality Assurance of Lambanog and Nipa Distilled Spirits

This booth provided information about the Nipanog industry in the region. Aside from the brief lecture, booth visitors aged 18 and above were also asked to participate in a Nipanog tasting and evaluation.

• Makapuno products

With a visually pleasing interior, the *makapuno* booth featured the products that were launched during the opening ceremony. Visitors were able to try and even take home samples of the *makapuno* hand and massage creams, lotion, and exfoliating soap.

• Philippine Science Centrum

With various interactive activities that catered to both young and old, this booth was a certified hit.

• DOST-PAGASA

As a country frequented by natural disasters, the booth of the DOST-Philippine Atmospheric, Geophysical and Astronomical Services Administration was both relatable and visually entertaining. Booth visitors were also given educational freebies like loot bags and information materials.

OneSTore featuring CALABARZON'S best products

DOST-CALABARZON's SETUP beneficiaries were given the chance to showcase their own products through the oneSTore booth, where visitors were able to buy products of SETUP adoptors in the region.

Visayan entreps honored at reg'l S&T fair

Text by Rodolfo P. de Guzman, *DOST-STII*

DOST Sec. Fortunato T. de la Peña (right), together with DOST-VII Dir. Engr. Edilberto L. Paradela (left) honor Bohol Governor Edgar M. Chatto (middle) as the official DOST Bohol S&T Ambassador during the opening ceremony of Central Visayas RSTW 2018. (Photo from DOST-VII)

RSTW BOHOL

The entrepreneurial spirit of the Visayans were once again showcased in the Regional Science and Technology Week (RSTW) celebration in Tagbilaran City, Bohol held from 14 to 16 November 2018.

The yearly science fair and exhibit was organized by the Department of Science and Technology-Region VII (DOST-VII) in cooperation with the Provincial Science and Technology Centers (PSTCs) of Cebu, Bohol, Negros Oriental, and Siquijor.

One of the highlights of the celebration was the awarding of the top entrepreneurs for 2018 from the four provinces in the region that exhibited outstanding performance in their respective businesses and for being innovative by using science and technology (S&T) in their operations. This year's top performers were all assisted under the DOST's flagship program called Small Enterprise Technology Upgrading Program or SETUP.

The event's special guest, DOST Secretary Fortunato T. de la Peña, lauded the SETUP adoptors for their passion in their business and for being open-minded in using science and technology to improve their operations.

Before the DOST-VII intervention, the entrepreneur-awardees were ordinary small business operators in their communities but they were branded as mavericks for embracing science, technology, and innovation. Theirs were tales of hard work, perseverance, and grit, and here are their stories.

Proven success of *polvoron*

The simple snack or dessert called *polvoron* has indeed come a long way after introducing S&T to the process of making it. Nicerato E. Carbonilla Jr. of Feb20 Enterprises from Mandaue City, Cebu is a living example of success that came from humble beginnings.

For 18 years, Carbonilla was making *polvoron* and peanut butter supplying some of the malls, supermarkets, and *pasalubong* stores in Colon and Mandaue in Cebu. His income was able to provide for his family well. However, it was in early 2017 that DOST-VII provided the company with a PhP 2.2 million-worth of technical and financial assistance. This involved automating its production process like roasting, sifting, mixing, molding, packaging, and labeling.

Currently, Feb20 has expanded its product line to include peanut *masareal* (sweets with peanuts), dried peanuts, *tableya,* and instant *champorado* (chocolate porridge). The company also reached out to a wider market in Metro Cebu, Bohol, Dumaguete, Southern Leyte, Butuan, Surigao del Norte, Metro Manila, and even in the Middle East. Also, their products are now available online, one of which is through the OneSTore.ph of the DOST.

Sweet success thru S&T

Not to be outdone in the food business was Josephine B. Chan of Jainin's Cakes and Pastries who was recognized as 2018 Best SETUP Adoptor for Siquijor. After 16 years of producing mouthwatering cakes and pastries, Josephine finally found a way to reach greater heights in her business when DOST-VII gave her funding support of around PhP 600,000.00. With the amount, she was able to buy highly efficient baking equipment that enabled her to increase production and prolong the shelf life of her baked goodies, which resulted in a 30 percent increase in revenue. Indirectly, Jainin's Cakes and Pastries was able to provide additional employment with her product outlets and retail stores not only in Siquijor but in nearby areas as well that cater to tourists.

Photo grab from Jainin's Cake and Pastries Facebook Page

Wooden success

Wood, normally used for furniture and construction, is transformed into works of wearable art by Crissander Enterprises that produces uniquely designed wood-based fashion accessories like bead necklaces.

It was in 2010 when Crispina Sarate-Singh started her small business. Eight years later, she was recognized as the 2018 Best SETUP Adoptor for Bohol. With just half a million worth of assistance from DOST-VII, she was able to upgrade her operations from designing to cutting, up to engraving using the laser cutter machine, belt and disc sander, and computer for digital design.

She was also able to avail of other SETUP assistance services like the Manufacturing Productivity Extension Program, product packaging and labeling, and training on wood furniture finishing and laminating.

Since then, the company has expanded its product line from fashion accessories to engraved gift and souvenir items sold in Alegria, Bohol and at the Island City Mall in Tagbilaran City, Bohol. They are also selling their products in Go Lokal concept stores.

Photo grab from Crissander

Success as strong as steel

RBD Machine Shop of Sibulan, Negros Oriental used to be like any other ordinary shop that caters to small businesses. But in 2014, the company solidified its hold in the market when DOST-VII introduced the resurfacing machine through the SETUP program. After the intervention, the company's annual gross income increased by 29 percent because of satisfactory results and zero percent rework.

In 2016, owner Ricky B. Divino sought the assistance of DOST-VII once more and was able to introduce the crankshaft grinding technology. With this, they no longer outsourced crankshaft grinding jobs, enabling them to complete recondition jobs faster.

Other S&T highlights

For the duration of the science fair and exhibit, different DOST attached agencies showcased their latest technologies and innovations in the exhibit. The DOST agencies that participated were the following: DOST-PHIVOLCS, DOST-PAGASA, DOST-Science and Technology Information Institute, Philippine Science High School-Central Visayas Campus, DOST-Advanced Science and Technology Institute (ASTI), DOST-Philippine Nuclear Research Institute, DOST-Industrial Technology Development Institute, DOST-Metals Industry Research and Development Center, DOST-Forest Products Research and Development Institute, and DOST-Philippine Textile Research Institute

Also, during the opening ceremonies, Bohol Governor Edgardo M. Chatto was officially proclaimed as the DOST Bohol S&T Ambassador to help in promoting science, technology, and innovation.

Other DOST officials present during the event were DOST-VII Regional Director Edilberto L. Paradela, DOST-ASTI Acting Director Dr. Joel Joseph S. Marciano Jr., DOST-Science Education Institute Director Dr. Josette T. Biyo, and DOST Bohol Assistant Provincial S&T Director Vina R. Antopina. ***(Information from Reinhold Jek Y. Abing, DOST-VII)***

DOST-MIMAROPA celebrates S&T week in Occidental Mindoro

By Charlotte F. Pizarras and Dr. Ma. Josefina P. Abilay, *DOST-MIMAROPA*
Photos from DOST-MIMAROPA

San Jose Mayor Romulo M. Festin (center) receives his Science Ambassador award during the opening ceremony of the 2018 MIMAROPA RSTW.

In sync with its commitment to bring science and technology (S&T) closer to the people, the Department of Science and Technology (DOST) brought its wide array of S&T programs and services, technology trends and advancements, and research and development outputs to San Jose, Occidental Mindoro on 10 to 12 October 2018.

This is in celebration of the MIMAROPA Regional Science and Technology Week (RSTW) aptly dubbed "Changing Lives through Science."

DOST Secretary Fortunato T. de la Peña, together with DOST-MIMAROPA Regional Director Dr. Ma. Josefina P. Abilay and San Jose Mayor Romulo M. Festin, formally opened the annual celebration at the Seasons Hotel and Convention Center in San Jose, Occidental Mindoro.

Dr. Abilay said that the activities that were lined up for the RSTW would bridge the gap among scientists, researchers, S&T professionals, and the general public.

"We aim to instill in our people that S&T is an immense part of our everyday life, it can provide solutions to local problems, and is an important tool in stimulating regional socioeconomic development," said Dr. Abilay in her opening message.

Department of Science and Technology Secretary Fortunato T. de la Peña (middle) leads the ceremonial cutting of the ribbon to mark the opening of the 2018 MIMAROPA Regional Science and Technology Week.

RSTW OCCIDENTAL MINDORO

The three-day event features exhibits, research and development conferences, discussions, and technology trainings and forums.

Technology forums

People from various sectors, especially from the agriculture and industry sectors, participated in discussions during the many forums featured in the RSTW. Among the topics discussed include salt technology, wood and bamboo-based product design, food safety, newly developed rice technologies, wastewater treatment technologies, and smart agriculture.

DOST also took the opportunity to convene concerned government agencies and non-government organizations in a roundtable discussion to reconcile efforts and chart future cooperation in saving the tamaraw from the threat of extinction.

Clockwise from top: Dr. Jessica D. Rey introduces SMART agriculture to the attendees; Dr. Merlinda A. Palencia and Sean Litgvoet answer questions from the participants in the forum on Eco-Septic Tank and Vertical Helophyte Filter System; a small-scale farmer asked about the applicability of the Eco-Septic Tank and Vertical Helophyte Filter System to his farm.

Enhancing R&D in MIMAROPA SUCs

Meanwhile, key players on research, development, and innovation activities in the region touched base in a forum entitled "Towards Enhancement of the R&D Ecosystem of MIMAROPA SUCs: A Conference". The forum aims to foster a dialogue on the enhancement of the region's research and development (R&D) ecosystem. It was attended by participants from local government units, private sector, regional line agencies, and the six MIMAROPA state colleges and universities (SUCs).

During the conference, Department of Budget and Management-MIMAROPA (DBM-MIMAROPA) Regional Director Maria Angelita C. Cells shared updates on the National Budget Circular No. 461 or the Revised Compensation that could encourage faculty-researchers to engage in R&D.

The need for researchers to understand the market landscape and venture on technopreneurship and technology business incubation was also stressed by Dr. Tirso A. Ronquillo, president of the Philippine Association of State Universities and Colleges (PASUC) and Batangas State University (BatStateU).

DOST-MIMAROPA Regional Director Dr. Ma. Josefina P. Abilay with DBM-MIMAROPA Regional Director Maria Angelita C. Cells, PASUC and BatStateU President Dr. Tirso A. Ronquillo, and representatives from the six MIMAROPA SUCs and other government agencies.

Transponder technology and LiDAR-generated flood hazard maps

The MIMAROPA RSTW celebration also highlighted the importance of disaster preparedness with the signing of a partnership agreement with Future Aviation and Maritime Enterprise. The partnership agreement is for the installation of transponders that will stabilize the region's early warning system for impending floods particularly in remote areas.

Aside from the partnership agreement signing, disaster risk reduction and management officers attended a three-day training-workshop on high precision flood hazard maps. The workshop was conducted in partnership with the University of the Philippines-Training Center for Applied Geodesy and Photogrammetry and the Office of Civil Defense.

Left photo: Secretary de la Peña (center) and Dr. Abilay (right) sign a memorandum of agreement with Futuristic Aviation and Maritime Enterprise CEO Arcelio J. Fetizanan Jr. (left) to upgrade the early detection and warning systems in MIMAROPA
Right photo: Local DRRM officers were trained on using the light detection and ranging generated flood hazard maps.

Sci-Fun Caravan travelling science exhibit

Aside from the informative forums, the RSTW also featured interactive exhibits that were enjoyed by more than 7,000 students and teachers. The interactive exhibits were staged at the San Jose Municipal Gymnasium and were brought afterwards to the Mamburao Capitol from 13 October until 10 November 2018.

Facilitators from the Occidental Mindoro State College held an orientation for the students visiting the Sci-Fun Caravan travelling exhibit.

Students playing and learning at the same time in the interactive exhibits.

One of the region's SETUP adoptors show to Sec. de la Peña their products during the Secretary's visit to the Bansud Livestock Multipurpose Cooperative meat products.

The Secretary visits the newly-installed Vertical Helophyte Filter System in the public market of Gloria.

The winners of the 2018 Best Technopreneur award with the Regional Technical Evaluation Committee members.

2018 Best Technopreneur Awards

Capping off the event, exemplary DOST assisted micro, small, and medium enterprises (MSMEs) and Community-Based Enterprises (CBEs) in the MIMAROPA region took the center stage as they receive the Best Technopreneur award.

Sec. de la Peña commended the agency's science and technology innovations and programs, saying that all these efforts are anchored on the government's thrust to uplift the lives of the Filipino people. The Secretary added that the MIMAROPA's RSTW celebration was a testament of this immense role and significance of S&T.

Around 9,000 people attended the celebration composed of government employees, students, MSMEs and CBEs; people from the academe, media, among others.

DOST-MIMAROPA officials and personnel with Secretary Fortunato T. de la Peña.

R&D institutions key to biotech development in PH, says DOST chief

By Rodolfo P. de Guzman, *DOST-STII*

RESEARCH AND development institutions, especially those housed in different universities in the country, will play an important role in pushing for the development of biotechnology in the Philippines.

This was stressed by Secretary Fortunato T. de la Peña of the Department of Science and Technology (DOST) during the opening ceremonies of the 14th National Biotechnology Week (NBW) held from 13 to 17 November 2018 at the World Trade Center in Pasay City.

Indeed, biotechnology research done in different state universities and colleges (SUCs) in the country have paved the way for discoveries of new products and services that will eventually benefit the people and improve quality of life.

"This year's NBW theme 'Pambansang Hamon, Pambansang Solusyon' highlights the importance of modern biotechnology as a tool that can help address the myriad of challenges that our beloved nation must face to ensure fair and sustainable development for its people at present and in the future," said Sec. de la Peña in his keynote message.

Sec. de la Peña further disclosed that the objectives of the NBW are in conjunction with the DOST's thrust to promote and support research and development (R&D) initiatives through funding and technical assistance in the areas of agriculture, food, health and nutrition, environment protection and development, climate change adaptation, and a lot more.

The Secretary mentioned several R&D projects of the department that utilized biotechnology including the improvement of coconut varieties through genomics, genetics and breeding; the use of nuclear technology through mutation breeding, coupled with molecular techniques, to improve sugarcane varieties; and the use of medical devices for diagnostic and preventive purposes.

The five-day NBW celebration featured various activities that include the following: Agri-Biotech Bootcamp; Awit, Saya, at Bioteknolohiya (Jingle-Making Contest); Madulang Sabayang Pagbigkas para sa Bioteknolohiya; and the Biotech Fan Art: Poster Making Contest.

This year's celebration had the DOST as the host agency. Other collaborators for the NBW 2018 are the Department of Agriculture, Department of Health, Department of Environment and Natural Resources, Department of Trade and Industry, Department of Interior and Local Government, Department of Education, and the Commission on Higher Education, together with the academe, private companies, and other stakeholders.

The NBW is an annual event celebrated every third week of November pursuant to Presidential Proclamation No. 1414 that highlights the positive contributions of biotechnology to health care, food security, education, industrial and economic development, and environmental sustainability.

National Biotechnology Week. *The 14th NBW celebration was formally opened by DOST Secretary Fortunato T. de la Peña (4th from left) and Senator Cynthia A. Villar (third from left) on 13 November 2018 at the World Trade Center, Pasay City. Others in photo are (L-R) DOST-Philippine Council for Health Research and Development Executive Director Dr. Jaime C. Montoya, Paola Margarita Q. Deles from the Office of Senator Paolo Benigno A. Aquino IV, Department of Agriculture Undersecretary Segfredo R. Serrano, and Pasay City District 2 Councilor Ian P. Vendivel, representing Mayor Antonino G. Calixto. (Photo by Henry A. de Leon, DOST-STII)*

Collaboration is key in promoting biotech. *Secretary de la Peña bannered the many projects that the department is undertaking in line with biotechnology in the fields of food security, health diagnostics, agricultural productivity, enterprise development, and climate change adaptation. He also stressed the importance of collaboration with R&D institutions particularly in the regions to promote the safe use of biotechnology. (Photo by Rodolfo P. de Guzman, DOST-STII)*

Senator Villar and DOST Sec. de la Peña look at the raw material fibers used for research on textile at the DOST centerpiece display area during the 14th NBW celebration. (Photo by Henry A. de Leon,DOST-STII)

Journalist challenges student-writers to communicate biotech's benefits

By Enrico P Belga Jr., *DOST-STII*
Photos by Henry A. de Leon, *DOST-STII*

Stephanie B. Tumampos, science correspondent from the Business Mirror and one of the winners of the 2018 DOST Bantog Media Awards, pays attention to a participant of the writeshop as he forms a question based on the graph given to him and his group for an activity.

Student journalists and working professionals from various schools and organizations pay close attention to the lectures during the science journalism writeshop. The discussions focused on how science communicators can effectively disseminate the importance of biotechnology to our country's progress

COMMUNICATING ABOUT the wonders of science and technology is not an easy task. It is an acquired skill that requires a certain level of understanding on the complexities of scientific concepts to be able to translate them into layman's terms that can be easily understood.

Such is the challenge for science journalists, and more so, when writing about biotechnology.

Communicating about the benefits of biotechnology was the focus of the recent science journalism writeshop sponsored by the Department of Science and Technology-Science and Technology Information Institute (DOST-STII) during the 14th National Biotechnology Week (NBW), held from 13 to 17 November 2018 at the World Trade Center in Pasay City.

For the NBW, DOST-STII's science journalism writeshop series called #ScienceJournoAko took on the theme"Communicating the Benefits of Biotechnology through Print and Online."

The writeshop's resource person, Stephanie B. Tumampos, science correspondent from the Business Mirror, emphasized the lack of, or minimal, support to biotechnology efforts in the country.

"There are a lot of branches of biotechnology that are not given enough attention here in the country," said Tumampos. "The main issue has always been about safety, so you have to give the facts for people to better understand the situation," she continued, adding that the challenge is the same for both print and online publications.

Biotechnology, or the application of technology in developing living organisms for specific uses, has produced, among others, Bt *(Bacillus thuringiensis)* corn which is resistant to pests and insects, thus producing better yields. So far, Bt corn is the only successfully commercialized genetically modified crop in the country. But despite its vast potential to modernize the country's agriculture system, biotechnology is still somewhat a controversial topic among Filipinos.

This is somewhat saddening, said Tumampos, considering that the Philippines is actually a frontrunner in the field of biotechnology in the Association of Southeast Asian Nations region, as the first country to initiate a biotechnology regulatory system.

"However, the government does not allow any further biotech experiments, especially with Bt eggplant, despite assurances from leading Filipino biotech experts that biologically enhanced crops are generally safe," Tumampos lamented.

Taking on the challenge of communicating science

The challenge with communicating the benefits of biotechnology lies on how to effectively deliver the message to the people for them to gain appreciation toward the products of biotechnology, Tumampos shared.

"If you are a journalist, you have to read a lot to back up your information and support your write-ups. Find something that is thought-provoking," she suggested. "Consider a good research paper or a good science journal as source. It is very critical to write a biotechnology article to avoid misinformation," she emphasized.

Tumampos went on to explain that one of the challenges that science journalists face today is sustaining people's long-term interest in science-related stories, and this requires certain levels of specialization that not all writers possess.

People often fear what they don't understand, and if they don't understand what benefits scientific breakthroughs may bring, it will hamper public support in research and development no matter what potential the breakthrough could bring, Tumampos explained.

"Science is very exhausting, so utilizing graphs in explaining scientific stories will be very useful. You have to make something out of the confusing graphs that the scientists produce to show important data," she said.

During the workshop, participants were asked to write down questions that they could form based on graphs that were provided to them. The graphs contain complex data that may be confusing even for a trained journalist. This gave the participants the chance to immerse themselves in an activity that science journalists actually do in order to provide facts-based data for their stories.

Tumampos also reminded the participants to not be afraid to ask questions to get additional information. She said that scientists are actually happy to share their research to persistent interviewers because they are glad that someone is interested in their studies.

"Writing biotechnology news from conferences is the most challenging, but a scientific conference is the perfect place to find stories and ideas," said Tumampos. She likewise emphasized the need for science journalists to be extra pushy when asking questions to scientists to get the answers that they need.

"Scientists may be good in doing their research, but not all of them are good in writing journalistic articles. This is where we can help them in enlightening the public about their works," she said.

The science journalism writeshop was attended by student journalists from various schools in Metro Manila and nearby provinces. It also attracted the interest of walk-in participants that include teachers, employees from various private and government agencies, and science enthusiasts.

Biotech makes sugar industry 'sweeter'

By David Matthew C. Gopilan, *DOST-STII*

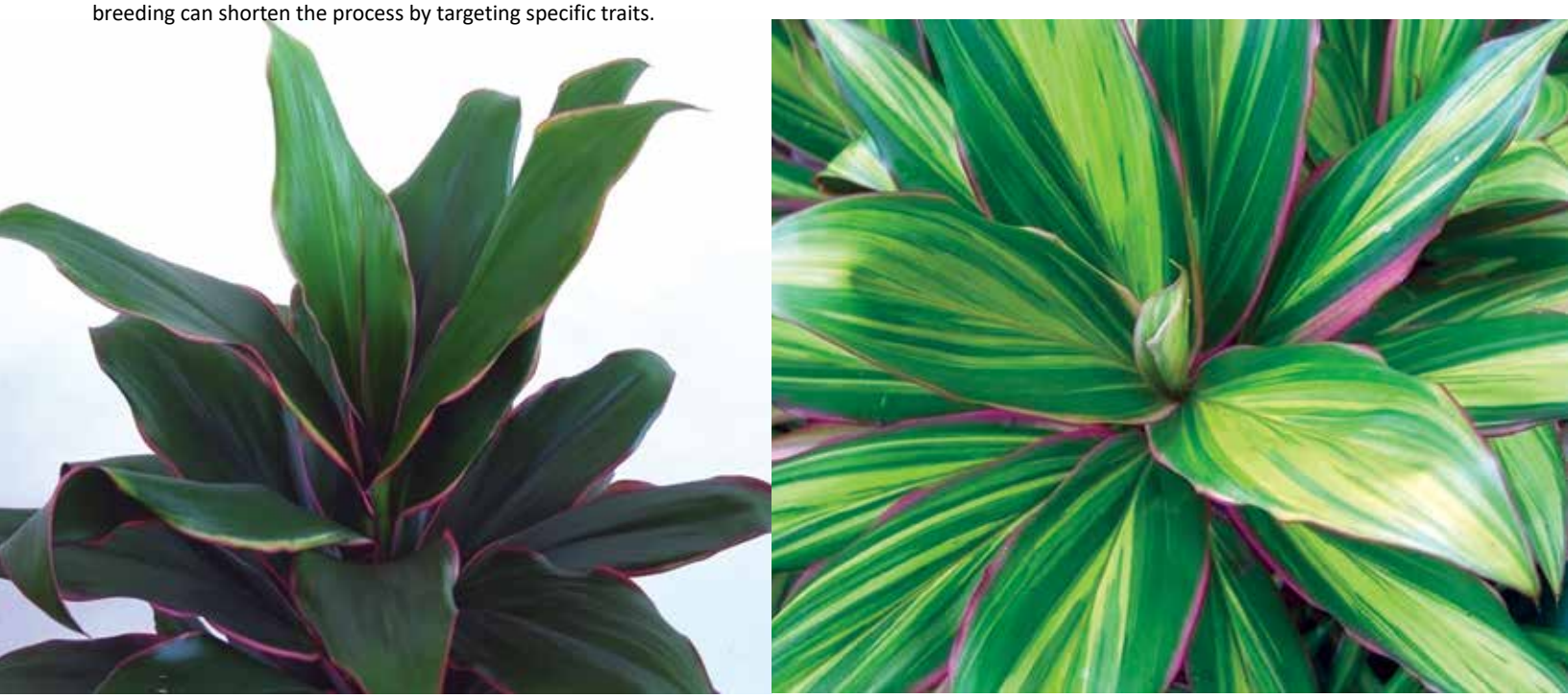
IDEAL SUGARCANE varieties are now achievable using biotechnology, thanks to researchers from the Department of Science and Technology-Philippine Nuclear Research Institute (DOST-PNRI) and the Sugar Regulatory Administration (SRA) of the Department of Agriculture.

In the SRA-funded project "Improvement of the Recommended Sugarcane Varieties Using Nuclear Technology and Biotechnology", researcher Jorge R. Sahagun of DOST-PNRI's Agriculture Research Division, used mutation breeding to achieve desired traits in sugarcane.

Mutation breeding is the purposeful application of mutation-causing agents like x-rays, gamma rays, or selected chemicals to come up with desired traits. Examples of desired traits in sugarcane are resistance to diseases, higher sugar content, and adaptability to drought, among others.

"Plant breeding for me can be described as the art, science, and business of improving a crop plant," said Sahagun. He explained that unlike conventional plant breeding wherein it will take years before a breeder can finally come up with the desired plant variety, mutation breeding can shorten the process by targeting specific traits.

Full-grown sugarcane. *(Photo from Rimmon T. Armones)*



Cordyline fruticosa or Tuncod Pari. *On the left side is the "natural" leaf color of the Cordyline 'Afable' plant. Notice the change in color on the same plant (right photo) after mutation, as it is now called Cordyline 'Kiwi'. (Photo from Jorge R. Sahagun, DOST-PNRI)*

Through mutation breeding, sugarcane breeders can grow sugarcane varieties with higher sugar content, thereby giving higher sugar yield. Mutation breeding can also increase sugarcane harvest even in a small hectare of land.

How does mutation breeding work?

Breeders need to identify first what sugarcane varieties they want to breed. Once identified, the breeders will expose the plantlets to different doses of radiation, a process called radiosensitivity test.

Once the breeders see how much radiation a plantlet can withstand, they will perform bulk irradiation to at least 1,000 plants per variety. They will then observe traits like sugar content, height, and cane diameter in a process called phenotypic selection. A phenotype is the observed trait of an organism, such as its appearance, development, and behavior.

Tissue culture of sugarcane comes next where breeders grow a tissue of sugarcane in a laboratory to manipulate further its genetic makeup. Once the breeders are sure that the plant already holds all of the desired traits, breeders then proceed to field trials.

Mutation breeding is often a go-to breeding technique due to its advantages like creation of traits that do not actually exist in the genetic makeup of an organism.

It is also the most inexpensive way to create crop varieties as it will only change a single trait without affecting the overall genetic makeup of the plant, especially for the elite cultivars.

Modern sugarcane cultivar. *John Moises G. Relles of La Granja Agricultural Research and Extension Center says that the common sugarcane cultivar is identified as Saccharum officinarum, a hybrid of Saccharum robustum and Saccharum spontaneum. (Photo by Henry A. de Leon, DOST-STII)*

Saccharum officinarum or sugarcane. *Some sugarcane varieties along with their variety name and radiation dose in which these samples are subjected. (Photo from from John Moises G. Relles)*

Sugarcane research in Negros

Meanwhile, John Moises G. Relles from the SRA's La Granja Agricultural Research and Extension Center in La Carlota City, Negros Occidental works on mutant and enhanced sugarcanes and compares them with their wild varieties.

Through molecular screening, he aims to see the particular set of DNA that are linked to agronomic traits like plant height, cane diameter, resistance to diseases, and higher sugar content.

Once these are identified, breeders can develop sugarcane varieties with the traits that they want.

According to SRA's principal sugarcane breeder Rimmon T. Armones, sugarcane cultivation started in the country even before the Spaniards came. However, sugarcane breeding only started in 1914, headed by then Bureau of Agriculture.

To date, the breeding program of SRA has developed over 80 high yielding varieties that they recommend for commercial planting.

Currently, there are 78,000 sugarcane farmers in the country. The whole sugar industry contributes about PhP 100 billion in sales due to sugar, ethanol fuel, and molasses.

Mutants in movies but not mutants in science. *Jorge P. Sahagun of DOST-PNRI explains that only the superheroes in Fantastic Four are the only "true" mutants since their mutation is due to exposure to cosmic radiation, unlike the mutants from X-Men and Teenage Mutant Ninja Turtles. (Photo by Henry A. de Leon, DOST-STII)*

Since Spanish Era. *Rimmon T. Armones of the SRA mentions that early Filipinos have been cultivating sugarcane long before the arrival of Spaniards in the country. Then, importation of foreign sugarcane varieties started in 1905 and was initiated by then Bureau of Agriculture. (Photo by Henry A. de Leon, DOST-STII)*

Women shine at Pisay's biotech career forum

By Allyster A. Endozo, *DOST-STII*
Photos by Maribeth R. Ollet, *DOST-PSHS*

Dr. Regina P. Berba (center) with students from Manila Science High School after her lecture on biotech career.

Karen Ann L. Hipol (center) during her lecture on biotech career.

IN A forum organized by the Philippine Science High School (PSHS) system, two of the school's women alumni inspired a roomful of "*Iskos*" and "*Iskas*" by sharing their rich experiences and perspectives in their careers

Karen Ann L. Hipol takes pride in being a teacher, a consultant, an entrepreneur, a graduate student, and a diplomat.

Realizing the opportunity to help build a science and technology (S&T) ecosystem in the country, she co-founded Hybridigm Consulting, Inc.—a one-of-a-kind local start-up that enables Filipino scientists to commercialize their technologies. As a consultant, she learned a lot on how to deal with different personalities, how to be business resilient, and on how to build credibility.

She likewise learned to become assertive with her own ideas as she pursued a master's degree in bioscience enterprise as a Cheavingfull scholar at Cambridge University in the United Kingdom. "[For] being open to new ideas, you're actually able to come up with better ideas because if you challenge [them] and see the holes, then everyone else would be able to provide solutions or alternatives," she said.

As the current Strategic Manager of the British Embassy's Newton Agham Programme, Hipol uses her "matchmaking" skills to encourage Philippine and British agencies to collaborate on S&T projects and programs—particularly on sectors like infrastructure development, disaster mitigation, and healthcare.

"We are growing at a fast pace because of many reasons," she said. "Unless we can produce our own technologies or come up with new knowledge we will always be lagging behind other countries, we will always be importing and copying new technologies," she added. She also underscored biotech innovation's vital role in strengthening the Philippine economic base.

As for Dr. Regina P. Berba, chairperson of the Infectious Disease Unit of the Philippine General Hospital, she chose to "tweak" her career at the right time as she considers being a scientist a really special profession. "It's not too difficult to find one's place in the future—there is too much abundance of need," she emphasized.

In her presentation entitled "Relevance in Science", she revealed her "satisfying" 30-year journey from being a biology student to an infectious disease specialist. Not minding the two-hour travel from her office at The Medical City in Ortigas, she continues to serve "the poorest of the poor" at the Philippine General Hospital in Manila.

Her involvement in outreach activities is unusually diverse for a doctor-scientist—from being a volunteer medic for indigent patients in Antipolo to a dance contest judge for 12,000 Grade 10 students in Pasig City.

"I live now to serve as many people as I can in various opportunities, not just in being a doctor but also being a scientist and a volunteer," Dr. Berba said.

Consistent with her humanitarian outlook, Dr. Berba applauded the recent research and development advancements in the medical biotech sector. These include Gene Xpert, a tool that has raised the diagnostic rate for tuberculosis from 30 percent to an astounding 90 percent. Another is the Biotek-M, a "lab-in-a-mug" diagnostic kit for dengue and tuberculosis funded by the Department of Science and Technology.

"If we're able to diagnose patients with fever in clinics and barangay health centers, there would be no need for huge hospitals," she said.

"Within one to two days, we can accurately diagnose the presence or absence of dengue. This will really save a lot of lives."

The event, dubbed "Career Talks and Forum on Biotechnology", was held on 14 Nov 2018 at Hall D of the World Trade Center in Pasay City, in celebration of the 14th National Biotechnology Week on 13-17 Nov 2017. The theme for this year is *"Bioteknolohiya: Pambansang Hamon, Pambansang Solusyon."*

Participants included high school students from PSHS's Main and Central Luzon campuses, Manila Science High School, and Pasay City North High School's Tramo campus.

Biotech lab kits eyed to aid HS studes in science experiments

By Allan Mauro V. Marfal, *DOST-STII*

HIGH SCHOOL students around the country will soon be able do biotechnology experiments in a classroom setting with an affordable and portable lab-in-a-box tool kit.

The Department of Science and Technology-Philippine Council for Industry, Energy and Emerging Technology Research and Development (DOST-PCIEERD) and a start-up company based at the University of the Philippines-Diliman are set to produce and sell biotech laboratory kits in different secondary schools in the country.

Called "BioTech in a Box" or BTBox, it is a hands-on, lab-in-a box tool kit which enables teachers and students to conduct biotechnology experiments in the classroom. The design is very portable, so schools with small spaces will still be able to put them to good use.

The innovation is part of the efforts to encourage students to pursue a career in science by letting them experience science first-hand in the form of basic experiments.

BTBox is composed of three kits, DNA extraction, genetic engineering, and gel electrophoresis. It also offers modules

Students of Laguna BelAir Science School explore the uses of Gel Electrophoresis, one of the three available kits in "BioTech in a Box" or BTBox. (Photo by Kenneth M. Kim of BT Box)

on Forensics, antibacterial resistance, climate change, and viruses and Vaccines. Its targeted price would be PhP 5,000.

According to Kenneth M. Kim, developer of BTBox and a marine biology student of the University of the Philippines-Diliman, they want to increase the capacity of science, technology, engineering, and mathematics (STEM) educators in the country and enhance the scientific literacy of students in biotechnology through inquiry-based kits.

"Adapting to the shift of the Philippine education to the K-12 system is not an easy task for most schools and educators," said Kim.

He further explained that teaching STEM is a huge challenge for educators without tools that can complement textbook-based teaching particularly for subjects that are either too abstract or not visible to the naked eye such as chemistry, cell biology, genetics, and molecular sciences.

Kim shared that only three out of ten public schools in the country have science laboratories, a deficit that currently exists because most schools are still adjusting to the extended K-to-12 system and STEM programs.

According to Kim, BTBox tries to link STEM learning to real-life applications that have a huge impact in changing the current challenges that the country face that are either due to a lack of information or misinformation.

"We see biotechnology as an area that could impact many sectors and services, from agriculture, healthcare, safe environment, and livelihood, "Kim said.

He added that he would like to see BTBox in the future as an instrument that can help more Filipinos better understand and realize the role of science in addressing real-life problems.

Kim also hopes that BTBox could contribute in making the Philippines become a science nation just like Singapore and South Korea, both of which heavily invested in research and treated it as a way to forward their economy.

BTBox was presented during the "Biotechnology in Education and Food Safety" organized by DOST-PCIEERD on 17 November 2018 at the Hall D of the World Trade Center in Pasay City. It was part of the recently concluded 14th National Biotechnology Week held from 13 to 17 November 2018.

Engr. Pamplona in his graduation photo. (Photos from DOST-V)

Bicolano DOST scholar aces licensure exams

By Dr. Rafaelita O. Lucena, *DOST-V*

FROM A young boy who experienced life's struggles early on to a young professional who gave honor not only to his family but also to his community and to everyone who helped him, Engineer Cedie O. Pamplona proves that with perseverance and hard work, success is not far behind.

In April 2017, Engr. Cedie topped the registered master electrician exam, and just recently, he placed fifth in the September 2018 electrical engineering board exam—something that his university and the whole Bicol region was proud of.

Prior to having that coveted title at the start of his name, Engr. Cedie's life story could be a material for television dramas. Raised by a father who works as a tricycle driver and nurtured by a mother who works as a store helper, he and his brother learned early on that life isn't easy.

Their simple life was put to test even more when super typhoon Reming devastated the Bicol region in 2006, back when Engr. Cedie was still in elementary.

"During Typhoon Reming our house was washed away by the strong flood waters," he recalled. That, he said, started the struggle of the family to make both ends meet.

Since then, he became even more determined to alleviate his family's condition. Because of his desire to help his family and succeed in life, Engr. Cedie persevered in his studies and finished his elementary and high school education in Mauraro, Guinobatan, Albay where he and his family reside.

Before taking on a college degree, he took and passed the qualifying examination for the Undergraduate Science Scholarship offered by the Department of Science and Technology (DOST)-Science Education Institute.

"I studied well until my college years and was blessed to become a DOST scholar from 2013 to 2018," he said, thanking the DOST for the great opportunity of being able to finish college.

Engr. Cedie certainly did not disappoint in his scholarship having graduated as *magna cum laude* with a degree of Bachelor of Science in Electrical Engineering at the Bicol University in Legazpi City, Albay.

"The recent recognition I earned as Top 5 in the engineering licensure exam was a blessing from God and the result of sleepless nights and hard work," said Engr. Cedie. "This is also my way of giving back to my parents for their priceless efforts and support in all my undertakings," he added.

Now a board-certified electrical engineer, he plans to work in Metro Manila and gain work experience and exposure particularly in the field of power system and design. He also plans to take up a master's degree while working.

Engr. Cedie's story is a testament to the saying, "A dream doesn't become reality through magic; it takes sweat, determination and hard work."

Then homemade, now big time!

MJ Foods journey to success through SETUP

By Julie Anne H. Baculio, *DOST-X*

THE SMALL Enterprise Technology Upgrading Program (SETUP) of the Department of Science and Technology (DOST) has helped many micro, small, and medium enterprises (MSMEs) improve their operations and boost their productivity and competitiveness by adopting technological innovations.

One of the MSMEs that achieved success through SETUP is MJ Foods which started out as a home based business and is now a big time supplier of homemade food items to supermarkets. The homemade products that they used to produce in small quantities are now manufactured and produced with better quality and in larger quantities.

MJ Foods' humble beginnings started in Cebu when the owners started making *longganisa* (sausage) and selling them on cash or credit basis to mothers, housewives, relatives, and friends. Through the years, MJ Foods has developed its own formulation that brings a distinct and unique flavor to its products.

In 1996, the family moved to Bugo in Cagayan de Oro City. The family continued to make *longganisa* and also added a new product—the lumpiang shanghai.

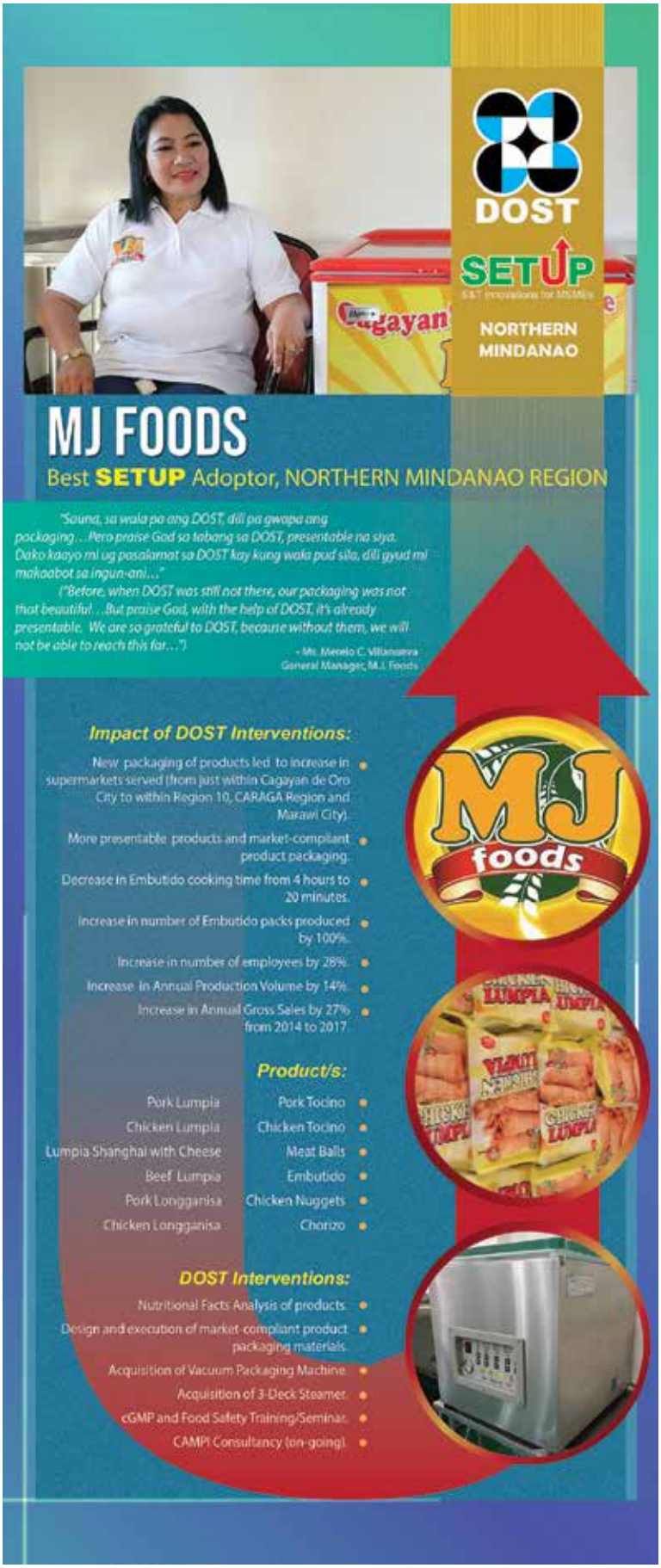
"Sa una sa wala pa ang DOST, dili pa gwapa ang packaging. Pero praise God sa tabang sa DOST, presentable na siya. Dako kaayo mi ug pasalamat sa DOST kay kung wala pud sila, dili gyud mi makaabot sa ingun-ani. (Before DOST's intervention, our packaging is not even good. But praise God, with the assistance of DOST, our packaging is now presentable. We couldn't thank DOST more than enough because without them, we would not be where we are now)," said Merelo C. Villanueva, MJ Foods' general manager.

The SETUP program helped MJ Foods create a new packaging for their products. This expanded the number of supermarket clients of the company, not just in Cagayan de Oro City but also within Caraga region and in Marawi City. The firm became a supplier of their homemade products to 12 supermarkets which is twice the number of supermarkets they served before the program's intervention.

Through SETUP, MJ Foods also acquired a vacuum packaging machine and a three-deck steamer for better and faster production. The SETUP assistance also came with other services that include nutritional facts analysis of finished products, training and seminar on Good Manufacturing Practices, and consultancy services.

With all the assistance provided by SETUP, MJ Foods was able to add two more products to their roster—the pork and chicken lumpia, both sold in one-kilogram packaging.

MJ Foods has proven that adopting technological innovations can make a big difference in increasing market competitiveness and ensuring success in business.



(Designed by DOST-CALABARZON)

Dr. Gay Jane P. Perez presents her research titled: "Drought and Crop Assessment and Forecasting" during the 10th Informal ASEAN Ministerial Meeting on Science and Technology, 75th Meeting of ASEAN Committee on Science and Technology held in Cebu on 19 October 2018. With this research, Dr. Perez bagged the Science Prize for Women award by the ASEAN, the United States Agency for International Development, and Underwriters Laboratories. (Photo by Henry A. de Leon, DOST-STII)

Pinay scientist wins 2018 ASEAN-U.S. Science Prize for Women

By Allan Mauro V. Marfal, *DOST-STII*

HER RESEARCH on using satellite data to help farmers to plant their crops in ideal areas and seasons won for Dr. Gay Jane P. Perez the 2018 ASEAN-U.S. Science Prize for Women.

Awarded by the United States Mission to the Association of Southeast Asian Nations (ASEAN) and Underwriters Laboratories, Dr. Perez took home $20,000 for her research called "Drought and Crop Assessment and Forecasting," which focused on how precision agriculture can improve farmers' yields using data from satellite observations.

She was awarded during the 10th Informal ASEAN Ministerial Meeting on Science and Technology, 75th Meeting of ASEAN Committee on Science and Technology held in Cebu City from 15 to 19 October 2018.

Dr. Perez is currently deputy director for Research Extension and associate professor of the Institute of Environmental Science and Meteorology at the University of the Philippines Diliman. She is also the project leader for Remote Sensing and Product Development of the Philippine Microsatellite Program funded by the Department of Science and Technology (DOST).

The ASEAN-U.S. Science Prize for Women recognizes female scientists who made major, safe, sustainable, and scientific contributions to the ASEAN region and their local communities, while also inspiring other young women to pursue careers in science, technology, education, and mathematics.

For 2018, the main focus of the competition was on precision agriculture and sought to reward those who are working on agriculture, digital tools, technology, and data to support small scale farming and regional agriculture.

Dr. Perez's winning research is about a monitoring and forecasting system that can assess the extent and severity of agricultural droughts in the Philippines at various spatial scales and across different time periods. Using satellite data, Dr. Perez was able to obtain geophysical parameters such as vegetation indices, surface temperature, rainfall, soil moisture, and evapotranspiration.

Evapotranspiration is the process by which water is transferred to the air by evaporation from soil, vegetation, and ocean, and by transpiration from plants. Transpiration happens when moisture moves up from plants roots to leaves, then changes to vapor and released to the air.

The first phase of the research was finished in 2013 and the results have been turned over to the DOST-Philippine Atmospheric, Geophysical and Astronomical Services Administration and to the Bureau of Soils and Water Management of the Department of Agriculture. Initially, the research has shown 73 percent accuracy in identifying drought occurrences in pilot areas.

Currently, the group of Dr. Perez is working on the second phase which aims to develop more crop-specific approach in coming up with advisories that can be distributed to farmers.

DOST-VIII director bags Presidential Lingkod Bayan Award

By Jean Gay Octaviano-Ragub, *DOST-VIII*

IN RECOGNITION of his exemplary performance as a visionary leader and public servant, Engr. Edgardo M. Esperancilla, regional director of the Department of Science and Technology-Region VIII (DOST-VIII) received the Presidential Lingkod Bayan Regional Award.

The awarding was held during the Pasidungog Awarding Ceremony of the Civil Service Commission (CSC)'s Search for Outstanding Government Workers on 24 October 2018 at the Summit Hotel in Tacloban City.

Engr. Esperancilla's notable initiatives and accomplishments in leading the implementation of DOST's programs in the region propelled his nomination, which eventually led to him bagging the award.

Among his noteworthy contributions is the implementation of the Yolanda Rehabilitation and Recovery Project, wherein Yolanda-stricken communities were provided with livelihood projects, employment opportunities, and trainings on various DOST-developed technologies.

Under Dir. Esperancilla's governance, DOST-VIII was able to strengthen the implementation of DOST-Science Education Institute's scholarship program in the region by having "one scholar per municipality," attaining an evident increase in the number of scholarship examinees and qualifiers.

Furthermore, DOST-VIII was the first among the regional offices to conduct the Filipino Patriot Scholars Project in 2017 that aims to instill in each scholar the core values of patriotism, professional excellence, social responsibility, and servant leadership, making them a future contributing force to the country's national development.

Dir. Esperancilla, together with the staff of DOST's Small Enterprise Technology Upgrading Program (SETUP) in Region VIII, has been spearheading the conduct of the Best SETUP Adoptor Awards, which aims to recognize outstanding entrepreneurs nationwide who have availed of the DOST's banner program. Among the successful SETUP adoptors from the region were Trophy Farm, hailed as 2016's National Best SETUP Adoptor; Ormoc Mac Mercury and Island's Best Calamansi Processing, which were the region's Best SETUP Adoptor finalists for 2015 and 2017, respectively.

In addition, DOST-VIII, through Dir. Esperancilla's ingenious leadership, has continuously pushed for the achievement of an effective science, technology, and innovation governance by maintaining its ISO 9001 and ISO 17025 certifications, as well as by enhancing office operations through the utilization of harmonized information systems. Through DOST-VIII's best practice of encouraging and supporting its workforce, the organization has produced eight employees who are officially recognized as technology or subject matter experts.

In 2011, Dir. Esperancilla was among the five recipients of the Gawad CES Presidential Award for his strong support to the development of the region's micro, small, and medium entrepreneurs, and also for his various commendable accomplishments in leading the DOST-VIII's program implementation.

According to the CSC, the Presidential Lingkod Bayan Award is conferred to an individual or group of individuals for exceptional or extraordinary contributions resulting from an idea or performance that had nationwide impact on public interest, security, and patrimony. The contribution may be a suggestion, innovation, invention, or superior accomplishment.

DOST-VIII Regional Dir. Esperancilla proudly holds his trophy during the CSC's Search for Outstanding Government Workers. (Photo from DOST-VIII)

2017 Best SETUP Adoptor in Region I

Mike's quality steel fabrication

By Florde Liza L. Alida, *DOST-I*
Photos from DOST-I

Mike V. Ruiz (second from left) with his wife, Jennilyn R. Ruiz (left), owner of Mike's Stainless Steel Fabrication with Dr. Armando Q. Ganal (second from right), Regional Director of the Department of Science and Technology (DOST) Region I, and Edison M. Acosta (right), science research specialist II of the DOST-PSTC La Union after signing the Phase 3 contract for the DOST's SETUP program in March 2018.

MIKE'S STAINLESS Steel Fabrication (SSF), one of the Department of Science and Technology (DOST)-Region I assisted firms in San Fernando City, La Union through the Small Enterprise Technology Upgrading Program (SETUP) is soaring high as its quality produced stainless steel products are getting stronger in the national market.

The rise of Mike's SSF

Mike Ruiz finally broke out of his shell when he quit his job from a stainless steel fabrication shop in Manila and found his way to San Fernando City, La Union where he worked in an owner-type jeepney fabrication shop, met and married an Ilocana, Jenilyn R. Ruiz, who was then working in a car servicing center.

With his dream to put up a steel fabrication that will sustain his family's financial needs, Mike and his wife saved their earnings until they had enough and decided to put up the Mike's Stainless Steel Fabrication (SSF) in Barangay Madayegdeg, San Fernando City, La Union.

During its startup, the firm was a one-man shop that used manually operated tools. From fabricating owner-type jeep, he shifted to the production of kitchen sinks, stainless steel railings, gates, windows, bakery oven, grease trap, cart, cabinets, and more. When he could no longer handle the operation alone, he hired his three younger brothers to help in the shop.

Winning a contract in Vigan City, Ilocos Sur was Mike's first engagement to bigger projects. His earnings from this contract were invested in other basic tools for his shop.

According to him, one of the problems he encountered was the influx of competitor firms that offered lower service rates. This led him to create more products like water tanks, food tables, burger griller, fryer, bed, and more.

Steeling the steel with SETUP

The strong competition in the market and low productivity pushed the Ruiz couple to open another door to enhance the quality of their products. They decided to enroll their firm in SETUP where they availed a total of more than four million peso-worth of technical assistance and equipment for three consecutive awards under the program.

"Noong una, mabagal ang produksyon, lahat mano-mano hanggang sa nakakuha ako ng SETUP, napabilis ang produksyon namin. Halimbawa, instead na gagawin naming ten minutes ang cutting, naging ilang segundo na lang. (At first, our production was slow. Everything was done manually until we availed of SETUP. We were able to expedite our production process. For example, it usually took us ten minutes to do the cutting, but now we can do it in just a couple of seconds)," said Mike.

Among the machines they purchased were mandrel tube bender (roll forming machine), box and pan bender, roller bending machine, power press, spot welding machine, a set of die molds, drill press, belt-driven compressor, powercraft air plasma cutter, and MIG welding machine.

"Ngayong available na ang mga machines, nagagawa ko na lahat ng gusto kong gawin, hindi gaya noon na gusto mong gumawa ng isang bagay, pero wala namang makina, at nakakabili na kami ng karagdagang gamit. (Now that we have access to these machines, we can produce the products we want to produce. Previously, even if we wanted to produce new products, we are unable to do so because we did not have these machines. But now, we can even purchase new tools)," explained Mike.

Aside from the equipment, the DOST through the Provincial Science and Technology Center (PSTC) in La Union provided an energy audit in order to ensure safety electrical setup in the firm. It also provided free seminars on metals identification and selection, TIG welding, and productivity and quality or occupational health and safety to enhance skills, knowledge, and productivity of its workers.

Mike V. Ruiz (left) supervises his staff to form a perfectly rolled water tank tube through the mandrel tube bender (beside Mike), a roll forming machine which he acquired through SETUP.

Maryrose Tacayan is the only woman among the staff of Mike. She works as welder and layout designer of water tanks. She also said that Mike's fabrication shop is just close to their house, thus she applied as a welder while taking care of her parents.

Mike proudly shows his stainless steel water tank ready for finishing and delivery. Stainless and galvanized water tanks are among the products of Mike's SSF after getting assistance from SETUP.

Mike's SSF and its advocacy

As Mike's SSF saturates bigger markets from north to south of the country, like some various popular hardwares, construction companies, hotels and resorts, and other companies from Regions I, II, IV-B, and in the National Capital Region (NCR), helping back the community is also important for Mike.

"Kung makaangat tayo ng kunti, dapat kasama ang mga tao ko dahil kung wala sila, 'di ko makakamit ang narating ko ngayon lalo na sa mga kaibigan, pamilya at asawa ko, at higit sa lahat sa Panginoon na laging nakasubaybay sa amin, (If I were to get a bit more successful, I want my employees to be with me. I wouldn't have reached this far if not because of them, especially my friends, family, and my wife, and most importantly because of God who always looks after us)," said Mike.

Mike also said that sharing of blessing is the most fulfilling thing on earth. The couple was able to provide stainless steel gate and arch with letters for Pinoma Elementary School in Caoayan City worth PhP 500,000.00, signage for Good Shepherd Chapel in Saint Louis University in Tuguegarao City worth PhP 150,000.00, and signage for Banbanan Brgy. Hall in Surigao del Norte worth PhP 250,000.00. They also sponsor events for the architects and contractors associations, and more. Further, instead of selling the metal scraps produced by the firm, he freely gives them to any garbage collector roaming around their village. He also accommodates on-the-job training for students from the nearby schools like the Don Mariano Marcos Memorial State University.

"Ibinabahagi ko lang ang mga naibigay sa akin ng Panginoon na blessing, ibinabalik ko lang sa mga tao. The more na nagbibigay ka, the more na nakakatanggap ka. Masarap ang pakiramdam kapag tumutulong ka, walang katumbas na pera at hindi mo maiisip na nalugi ka. (I am just giving back to my community what God has blessed me with. The more you give, the more you receive. It's also fulfilling when you help others without anything in return)," he added.

Mike's Stainless Steel Fabrication was the 2017 Best SETUP Adoptor in Region 1 and was nominated to compete for the 2017 National Best SETUP Adoptor during the National Science and Technology Week Celebration at the World Trade Center in July 2018.

DOST-IX receives quality management proficiency recognition

By Michael Daryll Ericson T. de Leon, *DOST-IX*

President Rodrigo Duterte presented the PQA award to DOST-IX Regional Director Martin A. Wee. (Photo from DOST-IX)

THE DEPARTMENT of Science and Technology-Region IX (DOST-IX) was recently conferred the Philippine Quality Award (PQA) Recognition for Proficiency in Quality Management (Level 2).

The conferment was made by President Rodrigo Duterte himself during the PQA Conferment Ceremony held at the Heroes Hall of Malacañan Palace on 24 October 2018. DOST-IX Regional Director Martin A. Wee received the award.

DOST-IX is the lone national line agency in the country to have been conferred with PQA Level 2 as of this writing.

The Recognition for Proficiency in Quality Management is awarded to organizations that demonstrated a thorough implementation of quality and productivity management principles and had significant progress in building sound and notable processes. Moreover, an organization must have demonstrated a solid approach to system-level quality and productivity management to receive the award.

The DOST-IX received the prestigious award after its comprehensive efforts to improve and maintain its services to the public after receiving the Recognition for Commitment to Quality Management (Level 1) in 2012. It was during the stint of then DOST-IX Regional Director and now DOST Undersecretary for Regional Operations, Brenda L. Nazareth-Manzano, that the coverage of the assessment period was conducted.

The ceremony was graced by key DOST officials including Secretary Fortunato T. de la Peña and Usec. Nazareth-Manzano. Also present during the ceremony were members of the PQA Organizers and Steering Committee headed by Secretary Ramon M. Lopez of the Department of Trade and Industry, Atty. Engelbert C. Caronan, president of the Development Academy of the Philippines and administrator for PQA-Public Sector, and Warren M. Enteria, president of the Philippine Society for Quality, Inc. and administrator for PQA-Private Sector, who also officiated the awarding.

This year's PQA Ceremony is intended specifically for 16 agencies and organizations across the country that successfully bagged the award for the 18th to 20th cycles of PQA (2015-2017). Aside from the DOST-IX, the DOST-CALABARZON (Region IV-A), and the DOST-Philippine Council for Industry, Energy and Emerging Technology Research and Development were also conferred with PQA Level 1.

The PQA is the highest level of national recognition for exemplary organizational performance. It is a national award program that recognizes the achievements of public and private sector organizations in their journey towards performance excellence. The PQA criteria focus on the areas of leadership, strategy, customer, measurement, analysis and knowledge management, workforce, operations, and results.

SCIENCE FOR THE PEOPLE

Department of Science and Technology (DOST) Secretary Fortunato T. de la Peña goes to various places and events to bring good news on how science works for the people.

10 October 2018 *– Secretary de la Peña stops by a booth that showcases DOST-assisted food products during DOST-MIMAROPA's 2018 Regional Science and Technology Week in San Jose, Occidental Mindoro.*

17 October 2018 *– Secretary de la Peña (second from right) and Prof. Dr. Emmanuel Tsesmelis (second from left), principal physicist and head of associate member and non-member state relations of the European Organization for Nuclear Research (CERN), sealed their partnership with a handshake after signing a Memorandum of Understanding (MOU). The MOU will explore potential areas of collaboration between the two organizations. Witnesses to the MOU signing were DOST Undersecretary for Research and Development Dr. Rowena Cristina L. Guevara (right) and CERN's Director for International Relations Charlotte Warakaulle (left).*

19 December 2018*–Secretary de la Peña (center) together with Department of Trade and Industry Secretary Ramon M. Lopez (left) and Department of Information and Communications Technology Acting Secretary Eliseo M. Rio Jr. (right) during the signing of the Memorandum of Understanding for the Startup Assistance Program 2019-2023 implementation. The said partnership aims to help key start-ups in the country.*

29 October 2018 *– The Philippine contingent to the launch of Diwata-2 microsatellite, led by Sec. de la Peña (center), pose for posterity at the Tanegashima Space Center in Kagoshima, Japan. The group was joined by Japan Aerospace Exploration Agency President Dr. Hiroshi Yamakawa (fifth from right).*

The rest of the Philippine contingent include (from left to right): University of the Philippines Chancellor Dr. Michael L. Tan, PHL-Microsatellite Project 3 Leader Engr. Mark Edwin A. Tupas, Philippine Embassy in Japan's First Secretary and Consul for Economic Affairs Cassandra Karemaeh B. Sawadjaan, DOST-Philippine Council for Industry, Energy, and Emerging Technology Research and Development (PCIERRD) Chief of Human Resources and Institution Development Division Engr. Ermie M. Bacarra, DOST-PCIERRD Chief of Emerging Technology Development Division Edna C. Nacianceno, Philippine Deputy Chief of Mission to Japan Eduardo M.R. Meñez, Philippine Embassy in Japan's Economic Attaché Diane Merce B. Bartolome, PHL-Microsat Program Leader Dr. Joel Joseph S. Marciano Jr., and Political Officer John Razil G. Paramio from the Office of Senator Paolo Benigno A. Aquino IV.

20 December 2018 *– At the Senate of the Philippines, the Secretary attends the Senate hearing for the 2019 DOST Budget Proposal.*

From Manila to CDO: STARBOOKS convention highlights partnerships

By David Matthew C. Gopilan and Rosemarie C. Señora, *DOST-STII*

DOST-STII Director Richard P. Burgos encourages participants of the STARBOOKS Convention to engage fellow STARBOOKS recipients to learn about their strategies on how to improve the learning experience of students through STARBOOKS. (Photos by Henry A. de Leon, DOST-STII)

BELLY-TO-BELLY NETWORKING, partnership, and collaboration were the banner words of Director Richard P. Burgos of the Department of Science and Technology-Science and Technology Information Institute (DOST-STII) as he addressed librarians and teachers during the third STARBOOKS Convention, held on 11 to 12 October 2018 at the Bayview Park Hotel in Manila.

STARBOOKS or the Science and Technology Academic Research-Based Openly Operated Kiosks is a stand-alone, offline facility that contains local and foreign science and technology resources in text, video, and audio formats including journals, investigatory materials, and livelihood videos. It was developed by DOST-STII and is dubbed as the first Philippine science, technology, and innovation digital library-in-a-box.

The 2018 STARBOOKS conventions provided up-to-date library and learning trends for educators and librarians. It also gave the participants lots of opportunities for partnerships, as well as learnings through sharing of best practices in using and maintaining STARBOOKS.

"This event aims to open opportunities for partnerships. You have all the possibilities to reach out to your neighboring schools," Dir. Burgos said.

Dir. Burgos further talked about partnership and collaboration as a tool and a process. "Other people have competencies in other areas where you are weak; they can supply your need. The network becomes your tool," he explained.

He shared how DOST-STII's engagement with Telstra Foundation Philippines started from his social media post about STARBOOKS. Because of that Facebook post, an executive from the telecom giant sent him a message asking how Telstra can help. This eventually led to a partnership wherein Telstra sponsored solar-powered STARBOOKS units that were distributed to different schools in the country.

Dir. Burgos also emphasized that collaboration and partnership should be embedded in work processes, considering that education is broad and the issues related to it are multifactorial.

"You need other people who are experts in certain areas. Collaboration is an essential tool for success. We cannot succeed unless we collaborate," he added.

Dir. Burgos challenged the participants to be bold in their strategies to attract partners for their projects. "If you see a need in your

"Teachers are important and have a definite impact to future scientists and mathematicians," says Mayor Oscar S. Moreno of Cagayan de Oro City, at the recently concluded 2018 STARBOOKS National Convention-Mindanao Cluster. (Photo by Ceajay N. Valerio, DOST-STII)

Darren Honrado, a teacher from Patong Elementary School in Davao Oriental inspired the audience with his recollection of how STARBOOKS made its way to their school. He was among the STARBOOKS beneficiaries who shared their gratitude, experiences, and best practices in using STARBOOKS. (Photo by Ceajay N. Valerio, DOST-STII)

school or community, be bold and courageous to share it on social media. Someone will surely pick it up and might start a conversation with you," he suggested.

Teachers as vital link to STARBOOKS success

Meanwhile, in the final leg of the 2018 STARBOOKS Convention held in Cagayan de Oro (CDO) City on 14 to 15 November 2018, CDO Mayor Oscar S. Moreno described teachers as the bright stewards of science and technology knowledge.

"Teachers are important and have a definite impact to future scientists and mathematicians," said Mayor Moreno.

One teacher who has displayed dedication and commitment to his profession to shape future leaders is Darren Honrado, a teacher from Patong Elementary School in Davao Oriental. Honrado was among those who shared his gratitude to DOST for STARBOOKS during the convention.

Honrado shared that their school was the first in Mindanao to receive a solar-powered STARBOOKS, and for good reason. To reach their two-classroom school, one has to ride a *habal-habal* (motorcycle) for three hours, plus three more hours of trekking and crossing small rivers. They have no library, much less computers.

Integrating the information found in STARBOOKS to their lessons, he said that they have become effective teachers.

"It's not about the technology that you installed but about the future of "Patongyans." We were dubbed as a hopeless community," he said.

"We are very lucky to have received such gift from DOST. We were able to show the students to not give up and surrender, because someone cares," Honrado said.

At least 250 participants, mostly teachers and librarians from the regions of Northern Mindanao, Caraga, Davao, SOCCSKSARGEN, and the Autonomous Region in Muslim Mindanao participated in the last leg of the convention in CDO, making it the biggest among all of the four STARBOOKS conventions.

STARBOOKS in San Carlos City, Negros Occidental

One week before the STARBOOKS Convention in Mindanao, the city of San Carlos in Negros Occidental received six units of STARBOOKS on 6 November 2018, the day after the city celebrated its annual Pintaflores Festival.

The recipients were Bagonbon National High School (NHS), Don Carlos Ledesma NHS, junior and senior high schools of Julio Ledesma NHS, Sipaway NHS, and Quezon NHS.

Mayor Gerardo P. Valmayor Jr. received the STARBOOKS units in behalf of the people of San Carlos City. "STARBOOKS will surely prepare our students to the challenges of current times," said Mayor Valmayor.

San Carlos City Public School District Superintendent Ma. Carla L. Romanillos recalled that she first learned about STARBOOKS through the Facebook account of Dir. Burgos. Coincidentally, Dir. Burgos hailed from San Carlos City. "We've been noisy about STARBOOKS and that's how they learned about us," Dir. Burgos said.

Currently, there are 3,128 STARBOOKS deployed all over the country. Luzon has the largest share with 41 percent of STARBOOKS deployed, Visayas has 31 percent, while Mindanao has 28 percent.

Mayor Gerardo P. Valmayor Jr. was grateful to DOST-STII for supporting the development of San Carlos City, Negros Occidental. (Photo by David Matthew C. Gopilan, DOST-STII)

San Carlos City Public School District Superintendent Ma. Carla L. Romanillos recalls that she sent a message to Director Richard P. Burgos of the DOST-STII through Facebook on how to avail of STARBOOKS. From there, coordination was nonstop until STARBOOKS came to San Carlos City. (Photo by David Matthew C. Gopilan, DOST-STII)

Nobel Laureate honored for championing STI

By Reuben Andrew R. Razal and Michaella Louisse V. Candelario, *DOST-ITCU*

SIR RICHARD J. Roberts, British biochemist and molecular biologist who was awarded with the 1993 Nobel Prize for Physiology/Medicine, inspired the audience with his personal stories of success and insights on science at the first International Symposium on Science, Technology, and Innovation held on 19 November 2018 at the Philippine International Convention Center in Pasay City.

In his keynote address, Roberts revealed the key elements that landed him the prestigious prize: a genuine interest in science at an early stage, good mentors, and a determination to find answers in the simplest of things.

Most importantly, the Nobel Laureate candidly shared that luck played a major role in his success because of two important things: first was meeting the right people at the right time, and second was grabbing good opportunities.

"Every person in this room will have luck at some point. When it comes, take advantage of it, because if you don't, then what was the point of having it?" explained Roberts.

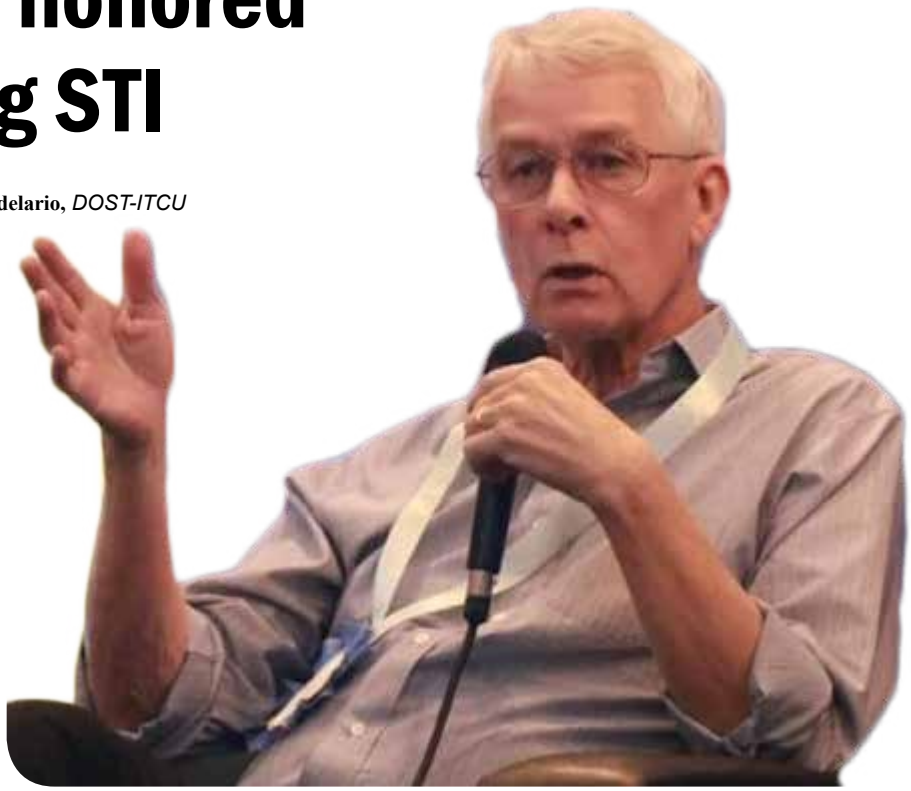
As an advocate of science to the youth, Roberts also emphasized the younger generation's role in enriching science in the country. He explained that young people around the world have made valuable contributions to sustainable development, and that these efforts must be considered when developing policies that aim to support and encourage innovation. He urged the youth to look at various sectors and choose where they can make the most impact

"I'm a great believer in youth. I think the nice thing about young people doing science is that they ask the sort of questions that I would no longer ask," he said.

Roberts continued, "Because if I were to ask some of these questions, people would look at me and say, 'Well, how come you don't know the answer?' And then they'd think I was stupid. And so what happens is when you get older, you tend not to ask the stupid questions that sometimes lead to new insights," he explained.

In closing, the Nobel Laureate urged Filipino researchers to invest heavily on basic research because it will enable them to make discoveries that will be useful to other researchers and will hopefully bring answers to the country's needs.

He also reminded everyone that finding a niche or area of expertise is a great way to start research so that the country can become an expert on it.



Sir Richard J. Roberts emphasized the importance of youth in enriching science during the 1st International Symposium on Science, Technology, and Innovation.

As part of Sir Richard Roberts' visit to the country, he also had a lecture at the University of the Philippines Los Baños and was conferred with the Doctor of Laws *(honoris causa)* for his advocacies and contributions in science.

DOST Undersecretary for Regional Operations Brenda L. Nazareth-Manzano (left) and DOST Secretary Fortunato T. de la Peña (right) honor Sir Richard J. Roberts (center) at the 1st International Symposium on Science, Technology, and Innovation.

Filipino Inventors Society celebrates its diamond year

By Allan Mauro V. Marfal, *DOST-STII*
Photos by Henry A. de Leon, *DOST-STII*

ALMOST 200 Filipino inventors, guests, and partners celebrated what is considered a milestone year for one of the oldest organizations of inventors in the country—the Filipino Inventors Society (FIS).

On 14 October 2018, the FIS celebrated its 75th anniversary at the Manila Hotel with the theme "Product Revolution: Harnessing the Power of Invention in Improving Lives and Building a Stronger Economy."

"This night is a celebration of the success, hard work, and dedication of all great inventors in the country," said Dr. Benjamin S. Santos, FIS president.

During the anniversary celebration, outstanding FIS members were recognized. The FIS Leadership Award went to Manuel R. Dono, Dr. Benjamin S. Santos, and Fely G. Ong. The FIS Lifetime Award was bestowed to Guillermo M. Chua, while the FIS Lifelong Commitment Award were given to Clemente Goballa and Ma. Theresa Dono.

Meanwhile, Department of Science and Technology (DOST) Secretary Fortunato T. de la Peña, who graced the occasion, assured the FIS of the support of the Department to all the programs of the organization and to all the inventors in the country.

"DOST and our attached agencies are always willing to extend our support to the needs of our inventors. It is our way of recognizing the valuable contributions of our Filipino inventors in providing solutions to some of the most pressing problems of our country," said Sec. de la Peña.

The FIS was founded in 1942 in the middle of World War II. It was established to promote the interests of inventors and their work by providing assistance in developing, protecting, and locating markets for their inventions, utility models, and industrial designs. The FIS also aims to diffuse information relating to industrial intellectual property, speak for inventors nationwide, and cooperate with persons and entities with similar interests.

DOST Secretary Fortunato T. de la Peña assures the members of the FIS of DOST's support in all activities and programs of the organization during its 75th anniversary on 14 October 2018 at the Manila Hotel.

"In our pursuit to contribute significantly in building a better nation, I would like to remind you that we should focus on creating inventions that are worthy and have tangible benefits to everyone," Dr. Santos reminded his fellow inventors.

One of the notable achievements of the FIS is the first National Exhibition of Inventions in 1957. This set the stage for Filipino inventors trying their hands in lobbying with Congress for the inclusion of invention development assistance in the government's priority agenda.

Secretary de la Peña together with FIS President Benjamin S. Santos (left) during the 75th anniversary of the FIS.

DOST's project boosts Marawi kids' health

Some of the mothers with their children attending the Tabang Marawi culminating activity.

By Rosemarie C. Señora, *DOST-STII*
Photos by Gerardo G. Palad, *DOST-STII*

28 NOVEMBER 2018 marked the end of the 120-day nutrition intervention for young children in Marawi City. But for the children, this is the start of their life-long journey towards better health and nutrition.

Based on results, the Tabang MARAWI (Malnutrition Alleviation and Health Restoration through After War Intervention) project of the Department of Science and Technology-Food and Nutrition Research Institute (DOST-FNRI) indeed improved the nutrition status of young kids in Marawi.

Children from Sagonsongan Temporary Shelter (Areas 2, 3, 4 and 6), Buadi Itowa and Sangonsongan Host Community in Marawi City showed improved health, proving the effectiveness of the DOST-FNRI intervention. The project combined complementary feeding among young kids and nutrition education among mothers to improve the kids' nutritional status and mothers' nutrition-related knowledge in a post disaster situation.

For 120 days or 4 months including Saturdays and Sundays, 266 children with ages six months to under three were fed with rice-mongo and sesame complementary foods while their mothers went to nutrition education classes.

The complementary foods were manufactured by the technology adoptors in the region namely: the University of Science and Technology of the Southern Philippines (USTP), Cagayan de Oro City, Sultan Kudarat State University (SKSU) and LGU-Tungawan, Zamboanga Sibugay.

Scientists in the Future. *DOST Undersecretary Dr. Brenda L. Nazareth-Manzano encourages Marawi City mothers to keep their kids healthy just as what they learned from the Tabang MARAWI project as their kids could become scientists in the future.*

DOST-FNRI and program proponent of Tabang MARAWI, Dr. Mario V. Capanzana said that the Institute's efforts in Sagonsongan Temporary Shelter are primarily a model intervention in post-disaster situation. He said that the strategy of feeding young kids with the DOST-FNRI developed complementary foods for young children has been proven effective in improving the nutritional status in various situations.

An average of 2.65-kilogram weight gain was recorded after 120 days.

Science for the People

During the project's culmination activity in an open covered court in Sagonsongan, DOST awarded the children with the most weight gain in the six project areas.

In her speech, DOST Undersecretary for Regional Operations Brenda L. Nazareth-Manzano encouraged the mothers to continuously apply what they have learned from the Tabang MARAWI project, and take care of themselves and their children through proper nutrition.

"These children could be scientists in the future," she said.

Meanwhile, DOST-XII Regional Director Zenaida P. Laidan shared some of the many programs of the region for the restoration of Marawi which include the high-value crops gardening, the technology based livelihood program, the fabrication of bio-reactor for the waste management in Marawi and STARBOOKS, among others. Dir. Laidan assured the participants that DOST will always extend assistance through science and technology interventions.

Further, the challenge posed by Dr. Capanzana is for the sustainability of the intervention in Sagonsongan and Marawi as a whole. He expressed his thanks for allowing the DOST-FNRI to bring the science-based food technology/intervention to Marawi to contribute in poverty alleviation and restoration of the young children's health and nutrition.

DOST Undersecretary for Regional Operations Brenda L. Nazareth-Manzano (seated, second from the left) joins (seated, L-R) Dr. DOST-FNRI Director Mario V. Capanzana; DOST-XII Regional Director Dr. Zenaida P. Hadji Raof Laidan; and DOST-X Regional Director Alfonso P. Alamban. With them are Lanao del Sur Provincial Science and Technology Director (PSTD) Payongan A. Pili (standing, third from left) and Lanao del Norte PSTD Ferdinand B. Soliven (standing, fourth from right), and the rest of the team behind the culminating activity composed of staff from DOST-XII, DOST-FNRI, LGU officers from Marawi City and Lanao del Sur, and representatives from the Tabang Marawi project and Sagonsongan Temporary Shelter.

Gov't agencies converge to boost farmers' production thru carrageenan

By Rochelle L. Cruz, *DOST-CALABARZON*

FARMERS FROM the towns of Tanay, Pililla, and Jalajala in the province of Rizal were treated to a day of experiential learning when they participated in the Farmers' Field Day on 16 November 2018, an activity organized by the Department of Science and Technology (DOST)-CALABARZON to promote the use of carrageenan plant growth promoter (CPGP).

The CPGP is extracted from seaweeds and degraded using gamma irradiation. When sprayed to rice plants, the CPGP has been found to increase yield by an average of 20 percent.

The Farmers' Field Day was held at the Department of Agriculture's Rizal Agricultural Research and Experiment Station (DA-RARES) in Barangay Cuyambay in Tanay, Rizal—the site of field experiments being conducted by DA-RARES on the application of CPGP.

As part of the activity, farmers and other guests did a field walk to look at the difference between rice fields applied with, and without CPGP. The researchers showed that a 20 percent yield increase (equivalent to 12 cavans of rice) was observed after applying the full recommended rate of granular fertilizer (RRG) and CPGP, compared with 10 cavans of rice when only RRG was applied.

Marissa Penuñar and Oscar Ledesma, farmers from Tanay and Pililla, Rizal respectively, shared their experiences in using carrageenan in their farms. They said that the carrageenan increased their yield and produced stronger and thicker tillers (stem). Plants applied with CPGP were also observed to recover fast from pest infection.

Aside from the testimonials of farmer beneficiaries of the program, there were also several discussions on carrageenan and its benefits in agricultural applications. The CPGP project was introduced by Angelito T. Carpio, senior science research specialist from the Crops Research Division of DOST-Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD). Dr. Lucille V. Abad, chief of the Atomic Research Division of DOST-Philippine Nuclear Research Institute (PNRI), discussed the carrageenan technology for rice farming. Meanwhile, Glenn Tabasa, one of the researchers from DA-RARES, presented the results of the field demo for dry season in 2018.

DOST-CALABARZON Regional Director Dr. Alexander R. Madrigal and Regional Executive Director Arnel V. De Mesa of the DA-Regional Field Office IV-A (DA-RFO IV-A), were also present during this event. Dr. Madrigal thanked the project partners and assured them that the DOST will always help in adding value to their production and processing.

As an agriculturist, Dr. Madrigal shared the important yield components to be considered and likewise shared his testimonial on the effect of using carrageenan in his own farm. "Mechanization will improve productivity and believing in technology will help solve our problems," said Dr. Madrigal.

Meanwhile, Dir. De Mesa also bared some of the projects of the DA aimed to further help the farmers in their production such as the rice tariffication bill, geo-tagging technology, and loan with low interest rate and no collateral. As a technology promoter himself, Dir. De Mesa believes that technology such as the CPGP will improve farm productivity.

During the event, the Palaypalay Maunlad Farmers Association, Inc., one of the project beneficiaries, were given carrageenan that they will be able to use in a one-hectare field for one cropping season.

Aside from DOST-CALABARZON, among the government agencies that collaborated for the Farmers' Field Day were the DA-RFO IV-A, DOST-PCAARRD, DOST-PNRI, and the National Crop Protection Center of the University of the Philippines Los Baños.

Guests and participants of the Farmers' Field Day visit the demonstration farm of rice fields to see the difference between plants applied with, and without carrageenan. (Photo by Henry A. de Leon, DOST-STII)

@ DOST, we offer solutions

science.ph

Science for every juan

Please visit

www.science.ph

Department of Science and Technology

Juan time

THE NEW FILIPINO TIME

PINOY TIME IS JUAN TIME

01-07 January 2019
National Time Conciousness Week Celebration

Display of Philippine Standard Time (PhST) label in agency's official clock

Production and display of a tarpaulin banner.

CALL FOR PAPERS

PJS SPECIAL ISSUE ON GENOMICS

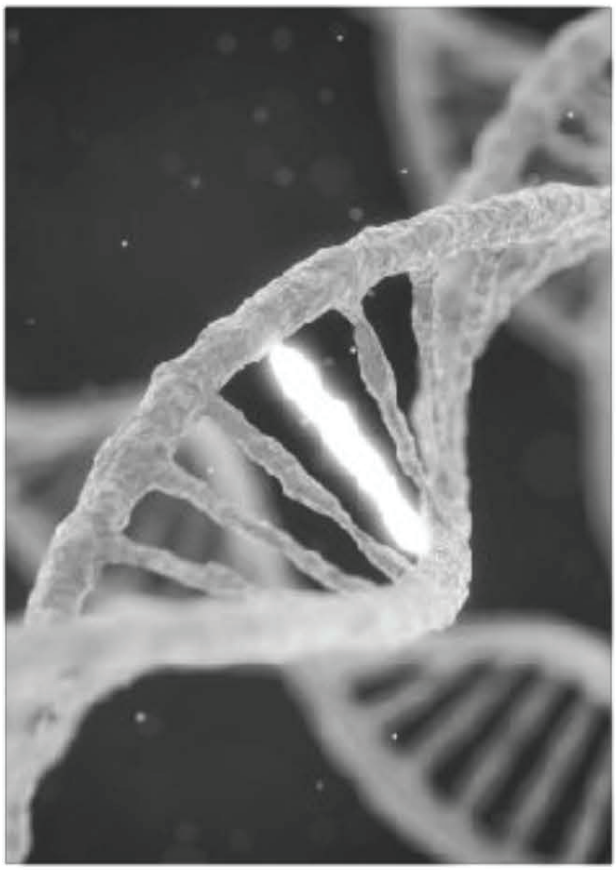


Photo from Bigstock Photo

The Philippine Journal of Science is now accepting submissions for a special issue on Genomics, dedicated to exploring the application of 'omics technology and bioinformatics in the country, covering all areas of biological investigation, including but not limited to health, agriculture, biodiversity, ethnicity, and forensics.

We will accept submission of primary research offering novel insights into:

- genomics (whole genome sequencing, targeted resequencing studies)
- functional genomics (transcriptional profiling, analysis of mRNA, microRNA, noncoding and other RNAs)
- evolutionary and comparative genomics
- genomic technology and methodology development
- computational biology, bioinformatics and biostatistics
- population genomics, association studies
- other 'omics fields: transcriptomics, proteomics, metagenomics, metabolomics, epigenomics

The deadline for submissions is March 15, 2019. Authors are advised to consult the most recent issue of the Philippine Journal of Science for the current format and style. Submissions are sent via email to:

The Editor-in-Chief
Philippine Journal of Science
Science and Technology Information Institute (STII)
DOST Complex, Bicutan
Taguig City, 1631 PHILIPPINES

Email: philjournsci@gmail.com