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# S&TPOST

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Colors of  
**SCIENCE**





## Vibrant science

Records from various sources tell us that the great Greek philosopher Aristotle developed the first known theory of color. He believed that it was sent by God through celestial rays of light and suggested that all colors came from white and black that represented lightness and darkness, respectively. He then related them to the four elements – water, air,

earth, and fire. This theory was widely held for over 2,000 years until Sir Isaac Newton's theory emerged.

It was in the 1660s when Newton started experimenting with sunlight and prisms. He showed that the clear white light was actually composed of seven visible colors by scientifically establishing the visible color spectrum. His work led to breakthroughs in optics, physics, etc. This brought about "Opticks", his great work on light and prism. He gave us the name ROY G BIV which stands for red, orange, yellow, green, blue, indigo, and violet that make up the visible color spectrum – the colors of the rainbow.

However, the famous Johan Wolfgang von Goethe challenged Newton's views on color. He once said that colors were light's suffering and joy. He argued that color was not simply a scientific measurement but a subjective experience perceived differently by each viewer. He made the first systematic study on the physiological effects of color. Information from the Smithsonian Library said that Goethe's views were widely adopted by artists, and he is best known for his poetry and prose, that he considered Theory of Colors his most important work. This rare book subsequently became the foundation for modern color printing. Then came Jacob Christoph Le Blon who was the first to outline a three-color printing method using primary colors (red, yellow, blue) to create secondary colors (green, purple, orange). He made an important distinction between

material colors as used by painters and colored light which was the focus of Newton's color theory.

Jumping into the local scene, one might notice the logo of the Department of Science and Technology (DOST). Aside from its peculiar shape which is a juxtaposition of four circles creating a flower-like image that seem to create an illusion of movement, there appear three distinct colors. Yes, they were not just thought of simply for aesthetics. As explained in most materials, the three-color scheme logo represents something thought-provoking: black is for the unknown, white for truth and enlightenment, and blue for progress.

Within the science community, colors, it seems, play a truly important role not just for aesthetics but for making people appreciate and understand the nitty-gritty role of science and technology in our day-to-day activities.

The DOST-Philippine Atmospheric, Geophysical, and Astronomical Services Administration (PAGASA) engages the public by making sense of its color-coded rainfall advisories. Meanwhile, a colorful scientific engagement is currently being done by the DOST-Philippine Textile Research Institute (PTRI) on natural dyes and tropical fabrics. New sources of dyes have been found from endemic plant species.

Central to this issue of the S&T Post, colors have been highlighted especially as they provide vibrant meanings to various programs and projects of the Department. The colors that science brings to the people signify real richness in terms of knowledge and opportunities.

Among those featured are acceptable levels of food colorants (DOST-Food and Nutrition Research Institute), science of colors, and colors of medicine. Other features are likewise colorful and vivid, such as the newly-listed reptiles in Bulusan Lake, oneStore bringing colorful native fans in France, and the lively designs of trinkets and novelty items in Salay, Misamis Oriental supported through DOST's Small Enterprise Technology Upgrading Program, among others.

Indeed, color is part and parcel of S&T and interpreting works of science through the use of colors is a sign that S&T in the country is alive and pulsating.

Aristotle P. Carandang, LPT, MPS, Ph.D

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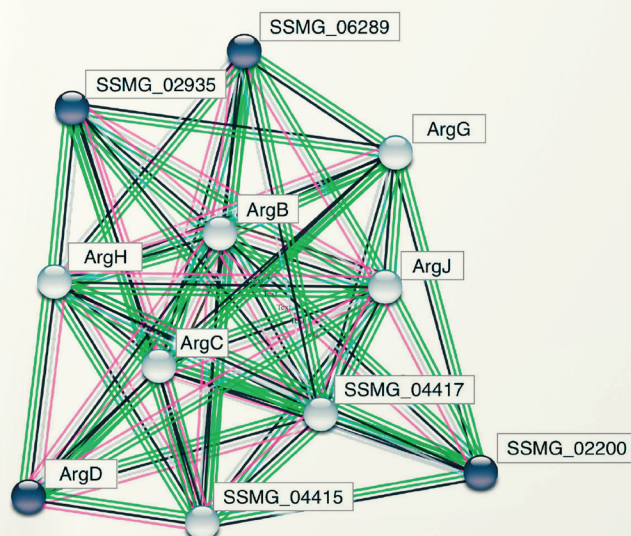




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Protein interaction network based on STRING database analysis with *Streptomyces* sp. AA4

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## ABOUT THE COVER



Lava flow for the naked eye is a glorious stream of fiery-colored rocky material cascading down a volcano. But examining lava under the microscope gives an altogether different view: a stream of colors, textures, and shapes that look more like raw jewels. When analyzed, these bits and pieces give us a better understanding on the conditions and processes that a volcano went through. This image was produced in a petrographic analysis of the 2006 lava flows of Mayon Volcano, courtesy of DOST-Philippine Institute of Volcanology and Seismology.

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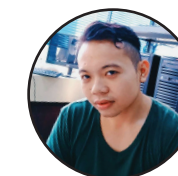
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WHAT'S NEW

# Defying gravity, augmenting reality

by Jasmin Joyce P. Sevilla, *DOST-STII*  
Graphics by Josemaria Zarraga, *DOST-STII*



**T** rue to its theme, Defying Gravity, the DOST-STII celebrated its 31st anniversary by introducing a one-of-a-kind annual performance report that has augmented reality (AR) feature in it – perhaps the first of its kind for a government agency.

Augmented reality is a technology that artificially simulates or re-creates a real-life environment by incorporating added or “augmented” computer-generated elements such as sound, videos, and photos.

In the case of the 2017 DOST-STII Performance Report, AR component is embedded within the report itself. This may be accessed using a smart phone application that will bring the information to “life” once the phone is pointed to the specific marker points within the report.

With this AR feature, the readers will be fully immersed in an amazing experience of browsing through the Institute’s performance report by bringing the computer-generated components into the real world.

To fully enjoy the Augmented Reality feature in the 2017 DOST-STII Performance Report, download the “stii2017” app from the Google Play Store to your mobile devices. Once done, open the app and point your mobile devices at the AR-rendered pages in the report.





# *Pets in Peace:* Cremation for beloved pets

by Mechelle D. Balboa & Jund Rian A. Doringo, *DOST-TAPI*

**P**ets have been considered valuable members of the family due to their playful and loyal characteristics. Studies show that pets help humans achieve a desirable level of happiness that can create a positive impact on mental and emotional health.

When pets pass away, many people feel that providing a dignified management of the remains of the beloved pets is but a final and fitting act of farewell. In the Philippines, more often than not, there are two options pet owners carry out in handling their pets' remains: home burial or cemetery burial.

This led Manuel M. Malonzo to invent a cremation equipment especially designed for pets to give pet owners an option on how they wish to preserve the memories of their pets.

The cremation equipment uses a closed system. It does not directly burn the carcass

but uses a low-cost pressure vessel that could reach a superheated steam stage and attain or even surpass the temperature required in cremation.

"The cremation equipment has no air emission and does not emit toxic pollution as it only consumes the smallest amount of fuel as compared to the existing cremation equipment in the market," said Malonzo.

Due to lack of financial capacity in prototyping the equipment, Malonzo asked the assistance of the Technology Application and Promotion Institute (TAPI) of the Department of Science and Technology (DOST) which provided a grant through the Industry-Based Invention Development (IBID) Program in 2014.

The IBID Program involves technical and financial assistance for the development and initial commercialization of inventions. It bridges the gap between fabrication

of commercial prototype and initial commercialization.

"IBID's generous assistance has made a great impact in commercializing my unique invention, reaching critical success in the cremation industry," said Malonzo.

In 2016, Loyola Memorial adopted the cremation equipment for pets and installed the invention in the Loyola Memorial Park in Marikina City. Moreover, Malonzo received two more orders of cremation equipment for Loyola Memorial's Sucat and Commonwealth facilities.

The passing away of pets is an emotional experience for pet owners. But through science and technology intervention, pet owners now have the option to keep the remains of their pets secure through cremation.



The Certificate of Project Completion is awarded by Elizabeth Garcia of DOST-TAPI.

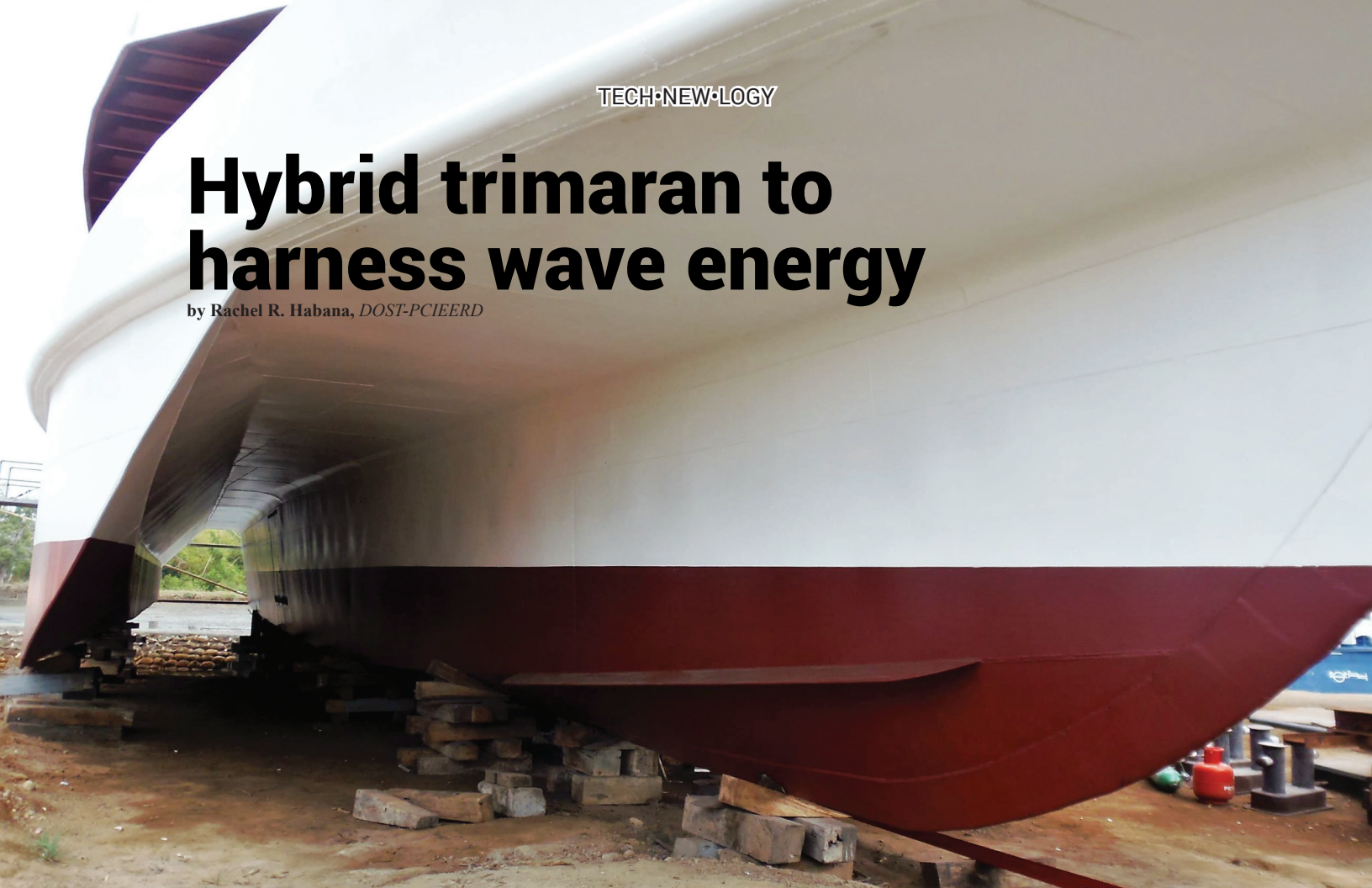


Cremation equipment designed by Manuel Malonzo.



# Hybrid trimaran to harness wave energy

by Rachel R. Habana, *DOST-PCIEERD*



**THE DEPARTMENT** of Science and Technology (DOST) will be funding the development of a hybrid trimaran cargo vessel that can harness energy from ocean waves.

This P76-million project is the brainchild of shipyard owner Engr. Jonathan Salvador. The project will be implemented by the Aklan State University (ASU), with the Maritime Industry Authority (MARINA) and Metallica Shipyard as its partners.

MARINA, as a project partner, will ensure that the vessel will be compliant with international safety and emission standards.

Having seven years of experience in shipbuilding, Metallica Shipyard will provide the hybrid craft's design and specifications.

The construction of the hybrid craft will improve our country's maritime industry as it is projected to be of modern design, environment-friendly, safe, and unsinkable.

The cargo vessel is being designed to have a capacity of 100 passengers, four vans, and 15 motorcycles. Steel will be used to build the vessel to ensure higher structure efficiency and better wave resistance.

Wave energy double action hydraulic pumps will be integrated in the outriggers of the hybrid craft. The mechanical movements in the pumps will be converted to electrical energy that can be used to provide additional power to the vessel. The more waves that the vessel encounters, more power will be produced. This technology is expected to improve the vessel's energy efficiency, making it not only cost-efficient, but also environment-friendly.

The vessel will use multi-engine technology that will prevent it from encountering total







*Ongoing works at the Metallica shipyard.*

engine failure while at sea, minimizing maritime accidents. It will also be constructed with a specifically engineered design to address the possibility of capsizing, making it practically unsinkable and able to withstand harsh environments at sea.

The construction will start this year and will be monitored by the DOST's Philippine Council for Industry, Energy, and Emerging Technology Research and Development. By 2020, the Philippines will get a glimpse of the finished hybrid trimaran fast craft passenger cargo vessel that harnesses energy from ocean waves.







*Dr. Annabelle V. Briones, DOST-Industrial Technology Development Institute (ITDI) officer-in-charge, presents a technology her research team developed.  
Photo by Ceajay N. Valerio, DOST-STII*

## DOST-developed technologies designed for socio-economic environmental gains

by Geraldine B. Ducusin, DOST-STII

**MOST TECHNOLOGIES** developed by the Department of Science and Technology (DOST) use local raw materials that went through innovations in terms of product or process improvements, making them distinct from their commercial counterparts.

“These government-developed technologies are designed to factor in the social, economic, and environmental benefits,” revealed Nelia Elisa C. Florendo, chief of the Technological Services Division of the DOST-Industrial Technology Development Institute (ITDI), when asked about the edge of their developed technologies over some of the commercial ones.

Another advantage of local technologies is their low cost compared with the commercial ones that are often imported. The technologies are made of locally-sourced raw materials which are readily available in the country.

DOST-ITDI also developed technologies that are responsive to climate change adaptation and mitigation.

“DOST-ITDI’s competent research teams, some of whom obtained their degrees abroad, use modern facilities in technology development,” Florendo added.

The Institute has been the Department’s lead agency in developing technologies useful for both enterprises and the environment.

In the recent DOST-ITDI series of technology offering forums, almost a hundred industries expressed interest to adopt and collaborate. Among the technologies presented

in the forum series were food technologies, food processing technologies, health and wellness, green engineering, and advanced technology which are available for transfer or licensing to interested entrepreneurs.

“We need the help of the people from the industry so that every Juan and Juana will



*Some of the technologies developed by DOST-ITDI.*



make use and benefit from the technologies we have developed,” DOST Undersecretary for R&D Rowena Cristina L. Guevara appealed to participants who mostly came from the industry.

Guevara recounted that some clients wanted to avail of the DOST-developed technologies, but were not yet ready to take them on.

To assist these businesses to jump from “we’re not yet ready” to “ready” mode and improve their facilities and production processes are DOST’s regional offices and facilities, said Usec. Guevara.

In the last five years, more businesses and local government units in Zamboanga, Butuan, Negros, Batangas, Camarines, Quezon, Ilocos, and even in Metro Manila area (Parañaque and Navotas), among others, have used DOST-ITDI technologies, especially in their livelihood and environmental programs. Among the commonly availed technologies are the bioreactor, plastic densifier, wine kit, and food-related technologies.

Growing local companies such as Splash Foods Corporation, Sally’s Authentic Bicol Express, House of Polvoron, Jennie’s Pork Chicharon, Navarro Foods International, Inc., Carreon’s Sweets & Pastries, Zambo Tropical Foods, Trappist Monastic Food Products, and host of others have also availed of or worked in partnership with DOST-ITDI.

The technology offering series of DOST-ITDI gave R&D teams and their public and industry stakeholders a venue to showcase and learn from each other. Their technology transfer team assessed and clustered its 27 technologies that demonstrated market potential. Six technologies were shown to be popular among the private sector clients, namely ready-to-eat chicken arrozcaldo; nipa sap sugar; analgesic balm; drum-dried banana, macapuno, and mango flakes; vacuum-fried banana, squash, carrots, and jackfruit; and slimming cream.

In the last five years, DOST-ITDI completed 152 research and development projects in chemicals and energy, environmental, and biotechnology, food materials science, and packaging. Some of the technologies which have been adopted include the OL trap, vinegar acetator kit, bioreactor, styro-plastic densifier, gasifier combustor, wine kit, calamansi processing, ceramic water filter, and food processing equipment.

Aside from developing ready-to-transfer technologies, DOST-ITDI has been providing technical assistance to the Filipino industries for many years now, from product packaging to product development, such as packaging R&D, process improvement, cleaner production, plant layout, test and analysis, waste treatment, and many other technical services which have resulted in increased productivity.

For more information on DOST-ITDI services and technologies, click on <http://www.itdi.dost.gov.ph/>.



*DOST-ITDI technology experts during the Green Technology Forum (L-R) Engr. Apollo Victor O. Bawagan, Engr. Reynaldo L. Esguerra, Dr. Myra L. Tansengco, Dr. Emelda A. Ong, and Dr. Marissa A. Paglicawan. Photo by Ceajay N. Valerio, DOST-STII)*



# PH standard time has social, economic benefits

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



*Screenshot from the teaser of Pinoy Ako, On time ako: Juan Time video.*

**THERE ARE** social and economic benefits if all our time pieces are synchronized with the Philippine Standard Time (PhST), according to the Department of Science and Technology (DOST).

“As we encourage the public to synchronize all their watches with Philippine Standard Time, we would like also to promote good habits like not being late and not making excuses in performing our respective duties and commitments,” said Department of Science and Technology-Philippine Atmospheric, Geophysical and Astronomical Services Administration (DOST-PAGASA) Administrator Dr. Vicente B. Malano

during the press conference for the celebration of National Time Consciousness Week held on 05 January 2017 at PAGASA Amihan Conference Room in Quezon City.

Republic Act 10535 or the Philippine Standard Time Act of 2013 sets the Philippine Standard Time in all official sources throughout the country. It also sets the National Time Consciousness Week every first week of January.

Dr. Malano said that if our offices, local governments, or private companies are making efforts to synchronize time devices with PhST, it means that we put so much value on time

management especially in delivering efficient kind of services to the public or to our clients.

“It is very crucial for a government agency like us to recognize the importance of deadlines and call times, especially if we would like to increase our credibility to the public. It is about showing that we are committed to our responsibility and we make ourselves accountable if we cannot perform our task on time,” Dr. Malano shared.

Meanwhile, for DOST’s Science and Technology Information Institute (STII) Director Richard P. Burgos believes that all industries,



businesses, and professions could gain a lot of benefits if punctuality becomes a serious practice for everyone.

“That is why we are celebrating this (National Time Consciousness Week) and we are encouraging everyone to sync their watches and clocks with the Philippine Standard Time, to remind us that, if we practice ourselves to be always on time, we could generate more income, we could save more lives, we could build better careers, and we could have a successful life,” Dir. Burgos said.

#### **Enacted into a law in 2013**

The importance of synchronizing all time pieces is highlighted under RA 10535. The law

also requires all government offices and media networks to use PhST as a basis to set their time pieces. The law also sets penalties for institutions that do not comply with the PhST requirements.

DOST-PAGASA has been the official time keeper of the Philippines by law since 1978.

Dr. Aristotle P. Carandang, chief of the Communication Resources and Production Division of DOST-STII, shared the early adaptors of this law. These are DOST-Region XI office in Davao City and San Pablo City in Laguna as the first government office and first local government unit (LGU) to adopt respectively, and Cauayan City in Isabela as first LGU to have all of its barangays display digital clocks in sync with the PhST.

Further, he shared that DOST activities are started on time and some adjustments are made so that programs are opened even when speakers or other involved individuals are not yet in the venue.

Dr. Carandang says, “This is our little effort that we would like to build on and work in order to increase the awareness of the public about PhST especially its main goal which is to inject in every Filipino the importance of respecting everyone’s time.”

He also said that DOST-STII is the agency mandated by law to conduct promotional activities related to PhST, including the celebration of National Time Consciousness Week.



*Dr. Vicente B. Malano (left), administrator of DOST-PAGASA, answers questions from the media during the press conference for the celebration of this year’s National Time Consciousness Week. This was held on 05 January 2018 at PAGASA Amihan Conference in Quezon City. He said that DOST encourages everybody to synchronize with the Philippine Standard Time as a way to develop good habits such as valuing time. Also in photo is DOST-STII Director Richard P. Burgos.*

**Photo by Gerardo G. Palad, DOST-STII**



# P172M fund to boost R&D in HEIs

by Mary Charlotte O. Fresco, DOST-NRCP

**THE DEPARTMENT** of Science and Technology (DOST) has approved the allocation of a total of P172.72M for Year 1 of implementation of an expert utilization program dubbed as “RD Lead” (for R&D Leadership). It is intended to hasten the research and development capability of Higher Education Institutions (HEIs) in the regions. RD Lead is one of the primary components of the DOST’s Science for Change Program (S4CP) to be implemented from 2017 to 2022. It intends to accelerate the growth and industry competitiveness of both academic and research institutions in the regions through competitive research, development, and innovation.

The DOST’s National Research Council of the Philippines (NRCP) shall implement the said program which will start as soon as the fund is released in January this year.

DOST Undersecretary for Research and Development Rowena Cristina L. Guevara in a meeting with DOST-NRCP officials said that council is the most appropriate agency to implement this program as it has “the cream of the crop in its roster of scientists, researchers, and engineers (RSEs) located throughout the country.”

As the implementing agency, DOST-NRCP will screen experts with strong leadership,

management, and innovative policy-making proficiencies who will then be deployed in selected HEIs to strengthen their research capacity, productivity, and utilization.

The RD Lead program, conceived by DOST, is set to be implemented together with NICER or the Niche Centers in the Regions for R&D which is also under the S4CP. NICER aims to capacitate HEIs in the regions to make significant improvement in regional research. DOST targets to establish at least one NICER in each region of the country. The DOST regional offices and the Regional Development Council (RDC) shall endorse applications of HEIs needing experts under the auspices of NICER and RD Leaders.

The RDC is the highest planning and policy-making body in the regions and serves as the regional counterpart of the National Economic and Development Authority.

An article posted on the Commission on Higher Education website underscores critical issues confronting HEIs in years which include limited number of competent or qualified researchers, inadequate linkages between potential partners in industry and counterpart institutions, lack of awareness on IP protection, lack of knowledge to commercialize research outputs,

and sustainability of R&D funding, to name a few.

The RD Lead program was designed to fill these gaps.

The RD Leaders will work in their respective host HEIs during the contract period and will help the HEIs increase the number of their publications in reputable journals, patents, and innovative products/processes with competitive commercial value; and assist in the development of research and development roadmaps, in modernizing laboratories, and in establishing NICER.

Because of the huge responsibilities inherent in the post, the experts shall be paid attractive salaries commensurate to their individual qualifications and research experience.

The NRCP will have a technical working group who will develop the qualifications and terms of references of the contracted experts for matching with the needs of the recipient HEIs. According to DOST-NRCP, detailed information on the guidelines and criteria will be uploaded on the council’s website as soon as finalized.

For this year alone, DOST-NRCP targets to hire at least 22 highly qualified RD Leaders for deployment to priority HEIs in the regions.



*R&D in higher education institutes will be more vibrant with the approval of P172.72M for “RD Lead” program.*



# DOST grants scholarship to students, S&T professionals in Marawi

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



*DOST Secretary Fortunato T. de la Peña (seated, middle) share a light moment with Mindanao State University (MSU) Marawi City campus students who will receive scholarship grants through the Bangon Marawi Program on STHR of the DOST-SEI. With them are MSU-Iligan Institute of Technology Chancellor Sukarno D. Tanggol (left) and MSU System President Dr. Habib W. Macaayong (right). Photo by Henry A. de Leon, DOST-STII*

**MORE THAN** 200 students and S&T professionals displaced during the five-month Marawi siege will now see a brighter future as the Department of Science and Technology-Science Education Institute (DOST-SEI) has committed scholarship grants in support of the rehabilitation efforts in Marawi City.

The scholarship grant was recently formalized through the project “DOST-SEI Bangon Marawi Program on Science and Technology Human Resources Development.”

The Memorandum of Agreement (MOA) between DOST-SEI and Mindanao State University (MSU) System was signed on 26 January 2018 at MSU main campus in Marawi City. DOST-SEI will provide scholarship grants to 225 selected undergraduate students in MSU Marawi City campus. The grantees, currently taking up Science, Technology, Engineering, and Mathematics (STEM) courses, will receive P10,000 per semester for school tuition fees; P6,000 monthly allowance; and P10,000 book allowance per year.

The MOA was signed on 26 January 2018 at the MSU main campus in Marawi City.

Moreover, DOST-SEI will facilitate the provision of financial assistance to selected S&T professionals in Marawi City pursuing higher studies in science and engineering in any of the DOST-accredited universities. Twenty slots will

be allotted to full-time graduate students who will receive P25,000 monthly allowance; P10,000 book allowance per year; and P200,000 research grant, plus the amount of the actual tuition fees of their chosen universities.

Meanwhile, 10 slots will be allotted to full-time PhD scholars who will receive P33,000 monthly allowance; P10,000 book allowance per year; and P475,000 research grant, plus the amount of the actual tuition fees of their chosen universities.

“With the heightened need to help rebuild Marawi City and the greater Mindanao area, DOST-SEI is here to open up opportunities for our children to continue their tertiary studies in STEM and achieve a future that is far removed from the effects of the war,” said DOST Secretary Fortunato T. de la Peña.

The five-month siege in Marawi City brought massive damages to many establishments including educational institutions.

Sec. de la Peña added that granting S&T scholarship is one strategy that will surely help restore and rehabilitate Marawi’s human and social infrastructures, especially our much-needed human resources in the science and technology sector.

Meanwhile, Dr. Josette T. Biyo, director of DOST-SEI, shared that many consultative meetings were held in recent months to discuss how DOST-SEI could aid in rehabilitation efforts in Marawi City.

“This program will enable displaced students and S&T professionals to get back on their feet and be instrumental in restoring the old beauty of Marawi City,” said Dr. Biyo.

She also said that accelerating S&T human resources development in Marawi City could provide long-term benefits for every Maranao. In years to come, many of these scholars could be scientists, engineers, and captain of the industries who would be at the forefront of initiating innovation and projects that could bring inclusive development to Marawi City, she told.

MSU President Dr. Habib W. Macaayong, affirming Biyo, said that producing highly-skilled professionals, particularly in the field of science and technology, could play an integral part to the sustainable development of an area like Marawi City.

“We have always mentioned how research and development in the field of science and technology could provide every Filipino a better living condition, and on the top of that, we need equipped individuals who would help and lead us to achieve our aspirations,” said Macaayong.

Biyo shared that a grantee should maintain a passing grade in all academic subjects every semester until completion of his/her course while for graduate students, a scholar shall maintain a general weighted average set by the university and DOST-SEI.



# DOST project pushes R&D commercialization in PH

by Engr. Maria Teresa Andrea B. Vargas, DOST - TAPI

**PARTNERSHIP IS** the best option for the Department of Science and Technology-Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development (DOST-PCAARRD) with the Technology Application and Promotion Institute (DOST-TAPI) as both committed to a two-year project to help DOST-PCAARRD funded technology transfer initiatives prepare Freedom to Operate (FTO).

Dubbed as “Support to the Preparation of Freedom to Operate (FTO) in the Technology Transfer Activities of PCAARRD-funded Projects,” the first year of the project ran from October 2016 to September 2017 with an extension until March 2018.

Originally the targeted 14 DOST-PCAARRD

funded technologies became 42 and these were all aided one step closer to commercialization by subjecting to the FTO services and obtaining FTO reports.

As of 2017, the project has reached 314.28% of its annual target.

Four more are currently going through the FTO services and is expected to be finished by early 2018.

Aside from giving assistance to researchers with assistance in obtaining FTO analyses, the project also provided a training-workshop to 25 researchers and technology transfer officers from different state universities and colleges, research and development institutes, and government councils and offices on 4-5 May 2017 at B-Hotel Alabang, Muntinlupa.

Teresita O. De Vera, FTO project leader, said that the enactment of Republic Act No. 10055 or the “Philippine Technology Transfer Act of 2009” has intensified the efforts in ushering local inventions and researches to commercialization, most especially those that were funded by the government.

“The FTO is a crucial part to the commercialization of these inventions and researches. It will secure them from risks associated with potential infringement of commercial products that are already out in the market,” De Vera added.

The FTO reports of the respective researchers and institutions were awarded in January 2018.



With DOST-TAPI's Mechelle D. Balboa are (L-R) Norly Villar of DOST-PTRI, Gregory Ciocson of DOST-PNRI, Dr. Melvin Carlos of DOST-PCAARRD, and Alex Ortiz of DOST-FNRI.



# DOST R&D budget hike to raise PH global competitiveness

by Rodolfo P. de Guzman, DOST-STII



**Partnership for R&D.** Secretary Fortunato T. de la Peña (second from left) of the DOST, together with Benita & Catalino Yap Foundation represented by Antonio S. Yap (rightmost), and SGV & Co. represented by Clairma T. Mangangay (second from right), DOST Undersecretary for R&D Dr. Rowena Cristina L. Guevara (center), and Dr. Carlos Primo C. David (leftmost) professor at the National Institute of Geological Sciences (UP Diliman) and former Executive Director of DOST-PCIEERD, seal the partnership during the Innovation for Learning and Development Forum. **Photo by Gerardo Palad**

**DOST UNDERSECRETARY** for Research and Development Dr. Rowena Cristina L. Guevara announced in a recent forum that the Department of Science and Technology's (DOST) budget for R&D again increased this year as she presented the DOST's innovation road map.

"In terms of funding the DOST is very fortunate. This is our R&D funding in the last eight years: notice that we started with P 1 billion in 2009 and we had P 6 billion last year. So the point here is that our R&D funding increased by a factor of six, meaning to say we can fund more projects this time," said Dr. Guevara.

The announcement was made during the Philippine Innovation Forum held on 19 February 2018 at the PHIVOLCS Auditorium.

DOST's R&D programs are anchored on the National Harmonized Research and Development Agenda (NHRDA) 2017-2022, encompassing five major areas: National Integrated Basic Research Agenda; Agriculture, Aquatic and Natural Resources Sector; Health; Industrial, Energy and Emerging Technology; and Disaster Risk Reduction and Climate Change Adaptation.

Dr. Guevara cited four examples of R&D programs that the DOST is funding, namely: Sustainable Mass Transport, Food Innovation Center, Tuklas Lunas (Drug Discovery program), and the Philippine Microsatellite Program.

To address the need for reliable and cost efficient mass transport system, the DOST

through the DOST-Metals Industry Research and Development Center developed the Automated Guideway Transit (AGT) system similar to the LRT and MRT; the Hybrid Electric Road Train (HERT) now being used in Clark Freeport Zone in Pampanga and in General Santos City; and the Hybrid Electric Train that runs on both diesel and electric power in cooperation with the Philippine National Railways.

The Food Innovation Centers (FICs) serve as research and laboratory hubs in the regions that help micro, small and medium enterprises (MSMEs) develop unique food products from locally available raw materials and farm produce. The 15 centers are located inside campuses of SUCs like those in Cagayan State University-Carig Campus in Region II, at the Eastern Visayas State University in Tacloban, Leyte in Region VIII, and at the Zamboanga State College of Marine Science and Technology in Region IX and at the Philippine Women's College of Davao in Region XI, among others.

The FICs are equipped with DOST developed and locally fabricated machineries almost half the cost of imported ones like the water retort, vacuum fryer, spray dryer, freeze dryer and vacuum packaging machine. These can produce novelty food products like tahong chips, fried Mayahini, chili sauce, powdered fruit juice drinks, mushroom noodles, and Sea Grapes Powder or lato.

For drug discovery, the DOST through the Philippine Council for Health Research and Development has already established some 10 Tuklas Lunas Centers all over the country. With the country's rich biodiversity, the centers serve as bioactivity and toxicity facilities used to create new medicines, either as drug or herbal, to treat several common diseases at lower costs like inflammation, diabetes, hypertension, pain, gout, lowering cholesterol, and possibly cancer. Some of the centers are the Mindanao State University, Iligan Institute of Technology Campus (as the first Tuklas Lunas Center), the Central Luzon State University (working on mushrooms for possible medicinal use) and the University of the Philippines Diliman (Institute of Chemistry, Institute of Biology, and National Institute of Molecular Biology and Biotechnology).

Lastly, the DOST is already into space technology with the deployment of the first Philippine made microsatellite called Diwata-1 on 27 April 2016 from the International Space Station. Diwata-1 is part of the DOST's Philippine Scientific Earth Observation Micro-Satellite (PHL-Microsat) Program which was initiated in December 2014. The 50-kilogram satellite is an updated version of the Raijin-2, which was designed, developed and assembled by Filipino engineers under the tutelage of satellite experts from Hokkaido University and Tohoku University in Japan. This satellite is now being used to generate clear images [15,000 in 2017 alone] for typhoon damage assessment, environmental assessment, lake turbidity, and more.

This initiative is augmented by the establishment of the ground receiving station called PEDRO and the University of the Philippines Small Satellite Research Facility for continuing education, training, and research in space S&T innovation and will serve as the link to local industries for developing valuable products and services.

Said initiatives are funded by the DOST-Philippine Council for Industry, Energy and Emerging Technology Research and Development which for the past years has led in pushing programs of innovation for the country to improve its global competitiveness.

The innovation forum was attended by DOST Secretary Fortunato T. de la Peña and DOST regional directors and agency heads. It was one of the activities in celebration of the Philippine Innovation Week (PIW) which was co-organized by the Benita and Catalino Yap Foundation and SGV & Co. PIW is celebrated every third week of February pursuant to Presidential Proclamation No. 172 to promote innovation for social and economic development.



# DOST-FPRDI to study regrowth, propagation of forest vines in Bicol

by Apple Jean Martin-de Leon, *DOST-PCAARRD*

**IN** A bid to help local artisans find new sources of raw materials, the DOST-Forest Products Research and Development Institute (FPRDI) will be starting this year a research project on forest vines that can be used for handicraft production.

Titled “Biological Studies of Economically Important Forest Vines in Camarines Sur and Albay Provinces,” the research will determine the volume and location of significant forest vines in the Bicol region. It will also study the factors affecting their natural growth and regeneration.

“The supply of raw materials for handicraft production cannot rely on natural regeneration. Nursery or plantation establishment is necessary to support the needs of the handicraft industry,” explained DOST-FPRDI’s Forester Jennifer M. Conda. She added, “This study will also evaluate the nutritional requirement, preferred environmental, and appropriate propagation techniques of forest vines.”

According to Conda, forest vines are among the least studied plant groups despite their promising use as raw materials for handcrafted items. Propagation and use of these materials for handicraft production can be an added source of income particularly of rural and forest dwellers.

The three-year project will be funded by the DOST-Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development.



*Forest vines can be turned into beautiful handicrafts that are in demand locally and abroad.*





# DOST-TAPI spearheads IP assets audit of gov't-funded R&D

by Caesar Angelito E. Arceo, DOST - TAPI



DOST-TAPI and APP sign a MOA to audit IP assets of government-funded R&D on 29 January 2018 during DOST-TAPI's 31st Anniversary Celebration. **Photo courtesy of DOST-TAPI**

**TO DETERMINE** the intellectual property (IP) assets that were generated from the Department of Science and Technology (DOST)-funded researches, the Technology Application and Promotion Institute (DOST-TAPI) commissioned the Association of PAQE Professionals, Inc. (APP) to perform IP audits in the country. This was announced during the Institute's 31st anniversary celebration on 29 January 2018.

DOST-TAPI's Director Edgar I. Garcia expressed the relevance of protecting IP assets of DOST-funded technologies to government research and development institutes, sectoral councils, universities, patent firms, and inventors in his welcome message.

"The APP is one of our important strategic partners particularly on IP protection, as it helped the Institute reach annual patent filings from 18 to 100 in 2014," stated Garcia.

"This is yet another milestone for us at the DOST," he added.

IP protection can lead to an increase in public funding and technology commercialization from government entities and interested parties.

Noel A. Catibog, vice president of APP, supported Director Garcia's message and mentioned that the association is willing to assist DOST-TAPI in assessing the patentable technologies and their eventual protection.

"This collaborative activity landmarks APP's humble contribution in ensuring the protection of government-funded IPs," said Catibog.

A Memorandum of Agreement was signed between DOST-TAPI and APP which shall initially cover at least 14 IP audits across the country and later assess about 700 technologies more.

The audits are expected to beef up IP filings of DOST-TAPI, specifically on patents, utility models, industrial designs, copyrights, and trademarks.

"We are delighted that APP agreed to partner with the Institute despite minor challenges," expressed Atty. Marion Ivy D. Decena, manager of Invention Development Division of DOST-TAPI.

APP is the only association of registered patent agents in the Philippines that passed the Patent Agent Qualifying Examinations administered by the Intellectual Property Office of the Philippines.

Atty. Decena explained that DOST-TAPI is the Department's licensing and commercialization arm in accordance with Executive Order No. 128.

Moreover, by virtue of Republic Act No. 10055 or the Philippine Technology Transfer Act, all government-funded research projects are encouraged to be commercialized with IP protection as a key for successful technology transfer.



# DOST social media managers share best practices

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

Photo by Gerardo G. Palad, *DOST-STII*



*WRAPPING UP THE THREE-DAY EVENT. Participants of the DOST Media Core Summit are now more equipped to provide S&T information services to the people.*

**SOCIAL MEDIA** managers of regional offices and various agencies of the Department of Science and Technology (DOST) gathered together in the #ScienceForThePeople DOST Media Core Summit to boost their social media practices and online presence. The Media Core is a network of communication practitioners deployed in various agencies and regional offices of DOST. The Science and Technology Information Institute, the information and marketing arm of the DOST led the event in the B Hotel, Alabang, Muntinlupa City last 26-28 March 2018.

Some of the best practices shared by the social media managers include the following:

**USE INFOGRAPHICS.** Lovely Aquino of DOST-Science Education Institute shared that infographics are fit for materials that contain too much information like call for proposals. She added that infographics could make people see the essential information under an artistic packaging style.

**SHARE SUCCESS STORIES OF YOUNG SCIENTISTS.** Aquino added that posting about media exposures and interviews as well

as the research efforts of young researchers are additional interesting content.

**USE LOCAL LANGUAGE OFTEN.** Sometimes, Facebook posts written in the mother tongue are effective in engaging the audience, according to DOST-I's Florde Liza L. Alida while sharing some samples from their office's Facebook account.

**APPOINT A SOCIAL MEDIA TEAM.** Alexandra Cabrera of the DOST-Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (DOST-PCAARRD) recommends that every division of the agencies should have a team focused on maintaining the social media accounts. The team should have an administrator, writer (or group of contributors), layout artist, photographer, and editor.

**PROMOTE OFFICIAL HASHTAGS.** Unified hashtags in all social media activities increase page likes and engagements according to Rochelle L. Cruz of DOST-CALABARZON. She added that both the social media team as well as other employees of the agency should promote the official hashtags. She also mentioned that

Facebook posts containing more photos gain more audiences.

Meanwhile, Dr. Aristotle P. Carandang, Chief of DOST-STII's Communication Resources and Production Division, encouraged the DOST Media Core members to share their success stories in social media and lauded them for the growth in their online platforms brought about by the Social Media Engagement 2.0, also an event of DOST Media Core held on 27 June 2017.

The event also aimed to mobilize the DOST Media Core in promoting Science For The People (SFTP) and the Science for Change (S4C) programs of DOST. SFTP plans to carry the latest S&T technologies, programs and services of DOST closer to the public. Meanwhile, S4C program aims to fast-track science, technology and innovation sector of the country by allotting substantial investment in S&T human resource development as well as in research and development.

The DOST Media Core members also finalized the proposed social media and editorial policies and styleguide to a more harmonious packaging on S&T information.



# DOST-STII's 31st Anniversary: Defying gravity

by Allan Mauro V. Marfal, DOST-STII

A “31st anniversary” may not look like a milestone, but for the Department of Science and Technology-Science and Technology Information Institute (DOST-STII), this proves otherwise.

In celebrating its 31st year, DOST's information and communication arm opened its doors to partners and stakeholders to showcase its accomplishments and share how its people overcame all the challenges and opportunities. It bannered the theme “Defying Gravity” in a festive mood during the celebration on 27 March 2018 at Bicutan, Taguig City.

“While we remain one of the smallest agencies of DOST with a staff complement of 54, we have certainly broken away from the shackles of the mindset of bottom-dwellers in 2017. We worked hard. We innovated. We learned how to defy gravity. We have taken off to fly!” said DOST-STII Director Richard P. Burgos.

Dir. Burgos shared that the year 2017 proved to be a breakaway year of sorts for the institute. He said that DOST-STII's budget from the national government grew 60% over 2016, the biggest increase ever in the institute's 30-year history.

“We received a grant of P70 million from DOST GIA for the comprehensive program Communicating Science for the People, the largest funding ever for the Institute, to fuel our ambition of doubling our reach and enhancing our capability and effectiveness. Our infrastructure projects were also approved and we are seeing renovated and better facilities already in place,” said Dir. Burgos.

Dir. Burgos also added that two of DOST-STII's projects DOSTv and STARBOOKS were included in the 2017 National Priority Plan of NEDA which also harvested their share of recognitions this year.

DOST Secretary Fortunato T. de la Peña said that DOST-STII continues to be a reliable and committed partner of all DOST attached agencies and regional offices, specifically in helping them to promote their various R&D projects and scientific services to its intended beneficiaries.

“DOST-STII's services have evolved throughout the years. From covering the events, writing press releases, conducting series of press conferences, and producing various publications, DOST-STII has become very active in discovering and introducing innovative ways to better communicate all the efforts of DOST to a larger audience,” said Sec. de la Peña.

During its anniversary also, DOST-STII launched its annual performance report that features augmented reality (AR) - first of its kind for a government agency. In the case of DOST-STII's performance report, AR components are



DOST-STII Director Richard P. Burgos (seventh from left) with the awardees and staff.  
Photo by Ceajay N. Valerio, DOST-STII

embedded within the report itself. This may be accessed using a smart phone application that will bring the information to “life” once the phone is pointed to the specific marker points within the report.

Aside from 2017 DOST-STII Performance Report, mobile applications of DOSTv, science.ph, and Philippine Journal of Science were also launched during the anniversary.

The 31st anniversary celebration also served as venue to honor DOST-STII's outstanding and loyal employees. Arlene E. Centeno, chief of DOST-STII's Finance and Administrative Division, was named Outstanding Manager while Alfon B. Narquita, head of the Information and Technology Unit, was hailed as Outstanding Senior Technical Staff. Gerardo C. De Jesus of

the Audio Visual Services Unit received the Outstanding Junior Technical Staff award and Ma. Rachel Diana S. Mesias of the Property Section was named Outstanding Administrative Staff.

Loyalty awards were also given to Framelia V. Anonas of the Content Development and Editorial Unit and Henry A. de Leon of the Audio Visual Services Unit.

The Director's special award called “Strongest Link” went to Cecille Rose R. Suñga of the Accounting Section while special recognition was given to Jaime R. Reyes for his efforts in constructing a storage house using scraps from the renovation of the DOST-STII office. The edifice is used as a store house for various materials weeded out from the office.



Employees of DOST-STII enjoy the Pinoy games prepared during the festive celebration of their anniversary. Photo by Charles Michael Maximo, DOST-STII



Members of the DOST Media Core (L:R) John Apolinario of DOST-IX, Ramil Uy of DOST-VIII, and Linel Anne Maje of DOST-MIMAROPA explore the newly-renovated library of DOST-STII. Photo by Ceajay N. Valerio, DOST-STII



# Bantog to recognize outstanding S&T communicators

by Mark Francis S. España, *DOST-STII*

Photo by Gerardo G. Palad, *DOST-STII*

**TO RECOGNIZE** the important role of media practitioners (print, radio, TV and online), in government and private practice, the Department of Science and Technology-Science and Technology Information Institute (DOST-STII) conceived Bantog: The Science for the People Media Awards. The awards will be conferred to S&T communicators in various platforms who made significant contributions to the promotion of science and technology information.

On its launch last 26 February, the nomination for the awards officially opened.

“We are looking forward to a stronger relationship with you as we continue communicating science for the people,” DOST-STII Director Richard P. Burgos said as he underscored the importance of media in fulfilling one of the mandates of DOST-STII which is to produce and disseminate essential S&T information to the public.

DOST Secretary Fortunato T. de la Peña likewise expressed his utmost appreciation for the support of the media to the promotion of scientific

and technological development and innovation in the Philippines.

“I encourage the DOST attached agencies to submit newsworthy S&T stories to the media. I have seen a lot of really interesting science and technology-related success stories in my visits to different parts of the country,” the Secretary said.

Bantog has four categories. The Institutional Media Award is given to an institution or organization that served as a vital link between the sectors and its clients through informative advocacy. Meanwhile, the Outstanding S&T Journalist Award is given to an individual media practitioner who has been an ardent advocate of science and technology whether in print, broadcast or online. Further, the Outstanding Regional Media Practitioner Award is given to an enthusiastic regional media personality who has shown strong support in promoting science and technology information. Finally, the Outstanding Information Officer Award is given to exemplary information officers in DOST working in the area of communication production and dissemination.

Nominees should be Filipinos or Filipino-owned media companies which have broadcast and published S&T information for the period of January 2017-March 2018. Nominees for individual practitioners from print, broadcast, and online media shall be judged according to substance, form, style, relevance of works and additional requirements by the board of judges. Meanwhile, nominees for institutional awards shall be judged according to innovativeness, relevance, and commitment to S&T reportage. The DOST Information Officer Award shall be based on his/her accomplishments in print, broadcast, online media, and public relations.

All Bantog awardees shall receive trophies while the individual category winners shall receive additional cash prizes. The Outstanding S&T Journalists for online, print, radio and TV will all take home P100,000; P50,000; and P25,000 for the first, second and third prizes respectively. The sole winner of Outstanding Regional Media Practitioner will receive P50,000 and the Outstanding DOST Information Officers will get P30,000; P20,000; and P10,000 respectively.



DOST Secretary Fortunato T. de la Peña (third from left) leads the unveiling of Bantog's trophy together with Assistant Secretary Emmanuel S. Galvez, Assistant Secretary of Finance and Legal Affairs (fifth from left), Director Richard P. Burgos of DOST-STII (fourth from left), Director Edgar I. Garcia of DOST-TAPI (second from left), and Dr. Aristotle P. Carandang, chief of Communication Resources and Production Division (first from left).



# DOST & 3M to share facilities to train scholars, researchers

by Allan Mauro V. Marfal, DOST - STII

IN A move that reflects the mutual intent of applying science to life and bringing it to people, the Department of Science and Technology (DOST) and 3M Philippines agreed to share facilities in order to train people especially scholars and researchers.

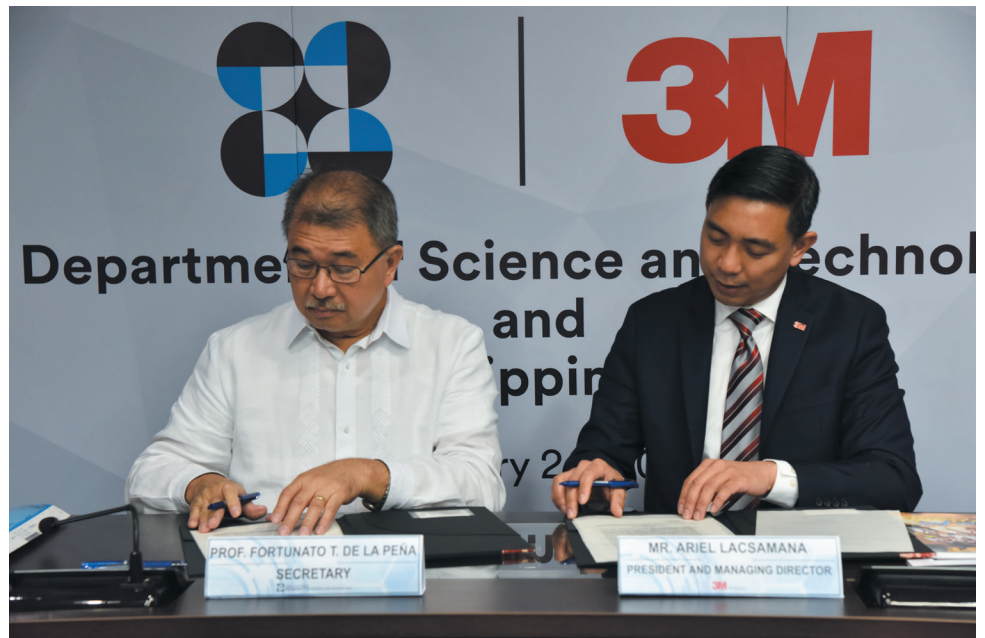
The agreement was formalized through a Memorandum of Understanding (MOU) between the science agency and the giant company on 24 January 2017 at the DOST office in Bicutan, Taguig City. Both institutions committed to working together in bringing sustainable development to the countryside.

"In this partnership, we would like to increase the capacity of our institutions in the regions, including colleges and universities, when it comes to producing better research and development (R&D) results," said DOST Secretary Fortunato T. de la Peña.

A company with an operating cash flow of \$6.2 billion in 2017, 3M manufactures a wide range of products—from health care and highway safety to office products and abrasives and adhesives.

Included in the agreed five-year collaborative efforts are the conduct of science immersion program for DOST scholars and researchers in 3M Customer Technical Center facilities, access to 3M's internship program for DOST researchers and students of the DOST-Philippine Science High School System, and co-development of at least two learning modules for DOST's STARBOOKS or Science and Technology Academic and Research-Based Openly Operated Kiosk program. STARBOOKS is the country's first digital science library-in-a-box with thousands of digitized science and technology resources in text and video/audio formats that can be accessed offline.

Moreover, the MOU also indicates that 3M experts will serve as research advisers and trainers to share their experiences and technical know-hows in the regional campuses of DOST-PSHS System. The company has also committed to carry out collaborative researches with DOST's research and development institutes and regional offices.



*DOST Secretary Fortunato T. de la Peña (left), and 3M Philippines President and Managing Director Ariel B. Lacsamana, sign the Memorandum of Understanding to work together on various S&T related projects and activities which are anchored on bringing sustainable development in the countryside. The signing ceremony was held on 24 January 2017 at DOST Office in Bicutan, Taguig City. Text by Allan Mauro V. Marfal and photo by Gerardo G. Palad, DOST-STII*

Further, the said partnership will also facilitate the upgrading of various DOST facilities through 3M products such as matting, very high-bond tape, and art/science pieces.

Meanwhile, the DOST-Metals Industry and Research Development Center and other DOST laboratories can also be used for 3M's research and testing purposes.

Sec. de la Peña explained that working with 3M Philippines is very essential for DOST, especially in achieving its goal of bringing inclusive development to the areas in the provinces.

"With the expertise, network, and resources that 3M Philippines will share with us, definitely, it will provide a major boost to our programs and I hope it will create several opportunities for our scientists, engineers, and researchers,

to contribute significantly in development in different areas in the regions," said Sec. de la Peña.

Meanwhile, Ariel B. Lacsamana, president and managing director of 3M Philippines, shared his excitement in forming a partnership with DOST, especially that both institutions have a shared common goal, which is to use science, technology, and innovation in providing better life for every Filipino.

"There are areas in the provinces that have tons of unique raw materials and resources which can be used in developing innovative products. That is why DOST and 3M Philippines would like to work together and share our facilities and resources. We want every Filipino in all parts of the country to succeed," said Lacsamana.



# Businesses in Palawan now “Going Halal”

by Raymart C. Narsico, Athena Colline L. Verdey, and Ma. Josefina P. Abilay, *DOST-MIMAROPA*

Photos by DOST-MIMAROPA



*What is Halal? Participants also shared their understanding of the Halal concept at the beginning of the forum.*

**FOOD ENTREPRENEURS** in Palawan are now looking to venture into the Halal industry or have their products certified as Halal to cater to the province's booming Muslim population.

In the Stakeholders' Forum and Consultation on “Going Halal” held 22 January 2017 at the Palawan State University (PSU), Puerto Princesa City, Palawan, a number of local micro, small, and medium enterprises (MSMEs) and Muslim Halal enthusiasts gathered to learn about the different aspects of the industry—from the fundamentals of Halal, opportunities for businesses, product certification, to Halal standards. The event was spearheaded by the Department of Science and Technology-MIMAROPA (DOST-MIMAROPA) in partnership with PSU and Al-Qafilah International (AQI) SdnBhd, an international organization based in Malaysia which specializes in conducting educational and training activities for Halal awareness.

Dr. Ma. Josefina P. Abilay, regional director of DOST-MIMAROPA, formally opened the forum and consultation emphasizing the opportunities that come along enhancing existing products and services to cater to the new and growing Halal market. Dr. Abilay also introduced the guest speaker, Dr. Zahimi Bin Chik, senior consultant of AQI. Dr. Bin Chik has worked with various international organizations on the development of Halal industry.

With the theme “How Going Halal can increase your sales,” the forum covered several topics including Definition of Halal, Benefits to Businesses, Benefits to Government, Opportunities in Halal Market, Acquiring Halal Certificate, and the Roles of Halal Industry Players. The concepts of Halal Park, Halal trading house, and centralized Halal Slaughter House were also introduced to give the participants an idea of the myriad

of opportunities to explore should Palawan go Halal friendly.

After the series of discussions, participants agreed to organize an association which they will call “Halal Business of Palawan” to advocate and lobby for Halal practices in the province. The association will be headed by the appointed president, Erick Yayen, owner of Ka-Inato Restaurant, one of the most popular restaurants in Puerto Princesa. The association will be pushing initiatives for local MSMEs to infuse the concept of Halal in their businesses and eventually be certified according to Halal standards.

There were 42 participants from the local food industry such as processors and restaurant and hotel owners; representatives from the local government units, state universities and colleges; and members of the Muslim community in Palawan.





## DOST hybrid electric train goes on endurance test

*Can transport 220 passengers per coach in minutes*

by Rodolfo P. de Guzman, *DOST - STI*

Photo by Henry A. de Leon, *DOST-STI*

**CABUYAO, Laguna --** The hybrid electric train being developed by the Department of Science and Technology-Metals Industry Research and Development Center (DOST-MIRDC) has been undergoing endurance tests for the past months, the latest of which was done at the Mamatid Station in Cabuyao, Laguna on 9 January 2017.

DOST Undersecretary for Research and Development Dr. Rowena Cristina L. Guevara visited the test site and personally rode the hybrid electric train accompanied by DOST-MIRDC Executive Director Engr. Robert O. Dizon and the project engineers led by its project leader, Engr. Pablo Acuin.

The DOST-MIRDC team has been testing the hybrid electric train by running an average of 100 kilometers of tracks, six to eight hours every day to ensure that it attains optimum operation.

"The hybrid electric train is only one of the mass transport solutions that DOST-MIRDC has developed that has two sources of power, the diesel generator set and batteries," said Engr. Dizon. The good thing in having two power sources is that the batteries are able to supply the

additional power needed during acceleration and at the same time the excess energy generated is absorbed during deceleration resulting in savings on cost of diesel.

The test run was conducted on a stretch of 2.7 kilometers carrying the equivalent of a full load capacity of eight passengers per square meter of space inside the train or 220 passengers per coach at a speed of 40 kph due to the present track condition. The hybrid train is designed to run at a top speed of 80 kph. Incidentally, the current Philippine National Railways (PNR) train runs at a maximum speed of only 35 kph.

The hybrid train is composed of five coaches, the last coach carrying the generator and the 260 lead acid batteries that will soon be replaced by lithium ion batteries.

According to Engr. Acuin, the hybrid electric train is equipped with two braking systems for maximum safety—one is electric and the other is mechanical.

"By conducting these tests, we are addressing the possible problems and one of the things we are now improving is the parking brake to guarantee that

it will not move once it stops," said Usec. Guevara.

The hybrid electric train, according to Engr. Dizon, has already undergone gap analysis conducted by Systra where only minor issues were raised like the adjustment on height of the flooring, installation of additional sensors, and lighting.

Systra is an international company that has been involved in UK mobility and mass transit schemes for the past 50 years and has delivered projects in the Republic of Ireland for nearly 40 years.

According to Engr. Dizon, all tests can be completed in six months. Thereafter, the project needs to meet international standards set by an independent body. "Actually our riding experience is very good, the ride is very smooth even with the gaps on the tracks and we really feel very safe inside the hybrid train," concluded Usec. Guevara.

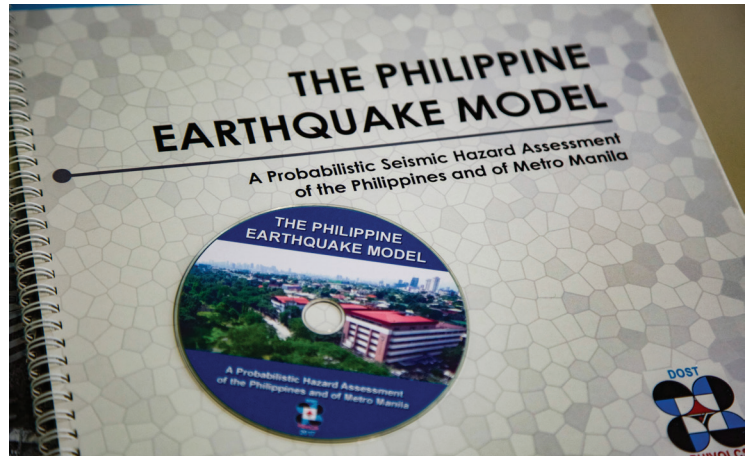
The hybrid electric train is being developed in partnership with the PNR and Fil-Asia Automotive Industries Corporation, the local fabricator of the coaches.



# DOST-PHIVOLCS launches Philippine Earthquake Model Atlas

*A guide in designing earthquake resilient buildings and urban planning*

by Rodolfo P. de Guzman, DOST - STII



A copy of the PEM atlas was turned over to the DPWH who is also a partner of the DOST-PHIVOLCS in the said project. DOST Secretary Fortunato T. de la Peña (3rd from left) handed over a copy of the atlas to DPWH Undersecretary Maria Catalina E. Cabral (2nd from left) as DOST-PHIVOLCS OIC and DOST Undersecretary for Disaster Risk Reduction and Climate Change Adaptation Dr. Renato U. Solidum Jr. (right) and DPWH Assistant Secretary Gilberto S. Reyes look on. **Photo by Gerardo Palad, DOST-STII**

**DILIMAN**, Quezon City – With the scenario of a 7.2 magnitude earthquake in Metro Manila that can happen anytime, the Philippine Institute of Volcanology and Seismology (PHIVOLCS), an attached agency of the Department of Science and Technology (DOST), launched the Philippine Earthquake Model (PEM) Atlas during a press conference held on 17 January 2018 at the DOST-PHIVOLCS headquarters.

“The Philippine Earthquake Map Atlas is the first of its kind in the country as a result of data gathered that highlight important parameters like the seismicity, active faults and trenches, ground motion prediction, ground acceleration and others for the entire Philippines and Metro Manila that can help land developers, urban planners, engineers, local government agencies and other stakeholders on appropriately designing houses, buildings and other structures to be earthquake resilient,” said Dr. Renato U. Solidum, Jr., undersecretary for Disaster Risk Reduction and Climate Change of the DOST and officer-in-charge of DOST-PHIVOLCS.

The PEM Atlas is a handbook that contains information on probable locations of seismic hazard that can help and guide structural engineers in designing earthquake resilient buildings and structures. This atlas will also be very useful in identifying appropriate design for low and high rise buildings that can withstand a strong earthquake.

DOST Secretary Fortunato T. de la Peña commended the DOST-PHIVOLCS for this

initiative because the department is tasked to explore new knowledge, to innovate, and develop solutions.

“It is a daring attempt to study and learn the hazards of earthquake; we cannot forecast but we can study the probability of its occurrence like DOST-PAGASA with its 100 years of typhoon events. It is good that DOST-PHIVOLCS has kept records of where and when earthquakes occur because historical records have a role in these maps,” said Sec. de la Peña.

The atlas is very important for city and municipal officials to properly identify the hazards in their areas where active faults are so they can device appropriate disaster preparedness and risk management plans.

As an information tool, the PEM Atlas will aid in revising the existing National Structural Code of the Philippines, a referral code of the National Building Code. This will serve as basis for designing and setting standards for earthquake resilient structures like residential and commercial buildings, critical facilities such as dams, bridges, and hospitals, and hazardous installations such as nuclear, biological, and chemical facilities.

According to DOST-PHIVOLCS, the PEM Atlas contains the Peak Ground Acceleration Maps and Spectral Acceleration Maps. These maps were generated from the Probabilistic Seismic Hazard Analysis through the collaborative efforts and expertise of seismologists, geologists, engineers, and

researchers from DOST-PHIVOLCS in consultation with the Department of Public Works and Highways (DPWH), Philippine Institute of Civil Engineers, Association of Structural Engineers of the Philippines, University of the Philippines Diliman – Institute of Civil Engineering, DOST- Philippine Nuclear Research Institute, De La Salle University, National Housing Authority, Insurance Commission, Philippine Insurers and Reinsurers Association, Inc., Metro Manila Development Authority, Office of Civil Defense, and Metro Manila local government units.

“We also thank the DPWH for their unwavering support to this project that started three years ago with a budget of P36 million, P21 million of which came from DPWH, and the rest from DOST-PHIVOLCS,” concluded Usec. Solidum.

Copies of PEM Atlas were distributed to institutional partners while other stakeholders will be provided, upon request, with a CD containing a digital copy of the PEM Atlas from DOST-PHIVOLCS.

For further information about the event, please contact: Dr. Renato U. Solidum Jr., undersecretary for Disaster Risk Reduction and Climate Change, DOST and Officer-in-Charge, PHIVOLCS at telephone numbers (632) 926-2611 and (02) 426-1468 and log on to their website at [www.phivolcs.dost.gov.ph](http://www.phivolcs.dost.gov.ph).



# DOST-PNRI partners with DepEd to strengthen nuke science education

by Hans Joshua V. Dantes, *DOST-PNRI*

Photo by DOST-P

IN A partnership ironed out through a Memorandum of Understanding (MOU), the Department of Science and Technology-Philippine Nuclear Research Institute (DOST-PNRI) and the Department of Education (DepEd) agreed to work together to strengthen nuclear science and technology education in the country.

The MOU, signed on February 8, establishes the partnership in implementing the Regional Technical Cooperation Project RAS0079 on Educating Secondary Students and Science Teachers on Nuclear Science and Technology by the International Atomic Energy Agency (IAEA).

The project aims to help increase the interest of students in the Asia-Pacific region towards science and technology in general, eventually leading to future careers in science, technology, engineering and mathematics (STEM). Through the project, educators will be able to gain and subsequently provide a more accurate perspective of nuclear concepts among secondary school students and a better understanding of nuclear and radiation applications in daily life.

"I am confident that this project will lead to an increase in the number of bright young people who will take up their studies in the nuclear field in the coming years," said IAEA

Director General Yukiya Amano. "They will then be well-placed to contribute to the health, well-being, and prosperity of their countries."

The IAEA designated the Philippines as host country for this new IAEA education project which is another milestone in the history of Atoms for Peace and Development in the country. The country is expected to serve as a model for other member states in the region and will also facilitate more IAEA technical and financial support towards nuclear science education in the Philippines.

The four-year project will facilitate the training of secondary science teachers and students on nuclear S&T throughout the IAEA member states through scientific visits, hosting of expert missions, and the conduct of regional and national seminars and workshops. Through the project, educational and learning resource materials on nuclear science will also be developed in various formats.

The Philippines, along with Indonesia, Malaysia, and the United Arab Emirates, previously participated in as a pilot country in an earlier IAEA outreach project which introduced nuclear S&T in the region's secondary schools.

The MOU was signed during the conduct of the IAEA Regional Workshop on Curriculum Development and Launching of Nuclear Science and Technology for

Secondary Schools from 5 to 9 February 2018 which was hosted by the Philippines.

During the workshop, IAEA experts from Australia, Japan, and the United States of America shared their experiences and strategies to help member states who have yet to include nuclear science in their education programs, and to sustain the progress of countries which are already in the process of integrating nuclear S&T in their respective curriculums.

To help ignite the interest of young students in nuclear science, IAEA experts trained Filipino science teachers on the use of interactive experiments, novel tools and high-tech instruments such as cloud chamber kits and radiation survey meters.

Dr. Takeshi Iimoto, a Japanese radiation protection expert and professor from the University of Tokyo, helped develop the classroom-scale experiments. During his visits to the pilot schools and interaction with students, he was impressed with how all pilot countries adapted the IAEA compendium activities from its original Japanese context into a form suited to their respective cultures.

"I am proud that Japanese knowledge and experiences accumulated over a long period of time, and tools developed in Japan are effectively used in their activities," said Dr. Iimoto.



Officials from the IAEA, DOST, and DepEd pose for a group photo after the signing of the Memorandum of Understanding by DOST Secretary Fortunato T. de La Peña (fourth from left) and IAEA Director General Yukiya Amano (fifth from left). Other in photo are (L-R): IAEA Department of Technical Cooperation Division of Asia and the Pacific's Jane Gerardo-Abaya (Section Head and Project Management Officer) and Dr. Najat Mokhtar (Director); DOST Undersecretary Dr. Rowena Cristina L. Guevara; DepEd Undersecretary Tonisito M.C. Umali; DOST-Philippine Nuclear Research Institute Director Dr. Carlo A. Arcilla; Ambassador Maria Cleofe Natividad, Permanent Representative of the Philippines to the IAEA; DepEd External Partnerships Service Director Dr. Margarita C. Ballesteros; and IAEA Technical Officer Dr. Sunil Sabharwal.



Workshop participants observe how experts lectured students about nuclear reactions



# Newton Agham awards P270M for S&T fellowship

by Mark Francis S. España, *DOST - STII*

**THE BRITISH** Government in partnership with the Department of Science and Technology (DOST), the Department of Agriculture (DA) and the Commission on Higher Education (CHED) recognized the Newton Agham awardees in a ceremony held on 11 January 2018 at the British Embassy Manila in Taguig City. Newton Agham awarded a total of P270 million to support scientific and technological innovation in the Philippines.

British Ambassador Daniel Pruce said that the Philippines and the UK have a strong partnership in science and innovation which will help achieve prosperity in the lives of the Filipinos.

One of the categories of the award is the Royal Academy of Engineering-DOST Leaders in Innovation Fellowship which will send 15 delegates composed of 10 researchers and five technology transfer officers to the United Kingdom for a two-week training course on innovation to build their capacity for entrepreneurship and commercialization. The recipients of this fellowship are Rita Grace Alvero from the De La Salle Health Sciences Institute; Ma. Cristina Bargo, Marie Antonette

Meñez, Leo Allen Tayo and Crisron Rudolf Lucas from UP Diliman; Michelle Macalintal from the Ateneo de Manila University; Evangeline Flor Manalang from DOST-Philippine Textile Research Institute; Ruel Mojica from Cavite State University; Melvin Pasaporte from UP Mindanao; Francis Aldrine Uy from Mapua University; Jeffrey Montecillos from UP Cebu; Hermogenes Paguia from Bataan Peninsula State University; Idona Marie Porlaje from the University of the Philippines System; Patricia San Jose from UP Manila; and Ranilo Violanta from the National Institute of Molecular Biology and Biotechnology.

During the awarding ceremonies, DOST Secretary Fortunato T. de la Peña underscored the Department's vigorous moves in advancing science, technology, and innovation to help the small and medium enterprises in the global market.

"Philippine researchers have produced world-class research outputs and technologies, but the more important thing is how to translate these to something useful," Secretary de la Peña said.

He also emphasized the Department's continuous support to Newton Agham Programs

in building capacity in science and technology for the Philippines' socio-economic development and growth.

The other three categories of the award include Biotechnology and Biological Sciences Research Council-Department of Agriculture Swine and Poultry Initiative, British Council-Commission on Higher Education (CHED) Institutional Links and British Council-CHED PhD Scholars.

One scholar, Paul Dominic Baniqued, revealed that through research he was able to develop a wearable robotic hand that can be used for the physical therapy of stroke and injured patients. He added that his research topic is on the development of neurotherapy using soft robotic hand exoskeleton. Baniqued and the other three PhD scholarship awardees are scheduled to complete a three-year PhD programme in the UK to enhance their areas of expertise.

The Newton Agham is an integral component of the Newton Fund which uses science and innovation partnerships to promote economic development and social welfare of its partner countries. The Newton Fund is part of the UK's official development assistance programme.



DOST Secretary Fortunato T. de la Peña (fifth from right) and British Ambassador Daniel Pruce (seventh from right), and former CHED Chairperson Patricia B. Licuanan (sixth from right) with the awardees during the Newton Agham Research and Study Grant awarding. *Photo by Henry A. de Leon, DOST - STII*



# DOST-STII partners with Felta to beef up upcoming interactive learning center

by Judy Q. Aca-Saclamitao, DOST - STII



*The DOST-STII and Felta Multi-Media, Inc. ink a three-year partnership in building the Center for the Arts in Science and Technology to be housed at the DOST-STII building. DOST-STII Director Richard P. Burgos (right) and Felta President and Chief Executive Officer Mylene R. Abiva show a set of LEGO EV3 and yoga laptop as part of Felta's donation turned over last 05 February 2018 at the DOSTv Studio in DOST-PAGASA Weather and Flood Forecasting Center, Quezon City. Photo by Judy Q. Aca-Saclamitao, DOST-STII*

**IN ANOTHER** step to expand its library services, the Department of Science and Technology-Science and Technology Information Institute (DOST-STII) recently partnered with Felta Multimedia, Inc. in establishing the Center for the Arts in Science and Technology (CAST) in DOST.

"The realization of the CAST project will not be possible without engaging ourselves with various partners like Felta who can provide us with educational materials and training sessions that can help modernize our library," quipped DOST-STII Director Richard P. Burgos.

Felta, a private company with many years of experience in the audio-visual field, is a major educational manufacturer and distributor that has partnered both with public and private schools in the country. It is also known for its partnership with

prestigious multimedia publishers and manufacturers worldwide.

The three-year partnership agreement includes Felta's provision of LEGO EV3 kits and Yoga laptops as well as training sessions at CAST or webinars using the DOSTv studio. On the other hand, DOST extends its exclusivity of partnership on Lego Robotics and study tablet with the said private company.

Moreover, Felta would be provided with booths during DOST events such as during the celebration of the National Science and Technology Week every July. Felta could also access CAST and DOSTv facilities for mutually agreed activities.

"Many students have become so interested in robotics. It would be good to provide them with demo activities, with educational materials they could use each time they visit us," Burgos said.

"If DOST is into science for the people, it is robotics for all of us in Felta," President and Chief Executive Officer Mylene R. Abiva remarked.

Felta is the national organizer of the Philippine Robotics Olympiad, an annual science educational event that primarily aims to challenge the intellectual skills and critical thinking of elementary and high school students.

The DOST-STII launched the Center for the Arts in Science and Technology (CAST) on 27 March 2018 and has likewise partnered with the following organizations, namely: Telstra Foundation, PuzzleBox 3D (Reseller of Ultimaker), Wacom Singapore Pte. Ltd., Philippine Business for Social Progress, and Morph Animation, Inc. (Toon City). This public-private partnership endeavor hopes to bring science and technology closer to more communities, among others.





DOST Secretary Fortunato T. de la Peña (leftmost), BCYF Founder and Chairman (rightmost), Mr. Antonio S. Yap, and (second from right) SyCip Gorres Velayo (SGV) & Co. Head of Learning and Development, Ms. Clairma T. Mangangay, present the certificate of appreciation to Mr. Sergio R. Ortiz-Luis Jr. (second from left), President of the Philippine Exporters Confederation, as one of the panel reactors in the Innovation Forum. *Photo by Gerardo G. Palad, DOST-STII*

## DOST sealed partnership with private institutions during the 2nd Philippine Innovation Week

by Laurence M. San Pedro, DOST-STII

WITH THE aim of bringing awareness to the public about the various innovations in the country, the Department of Science and Technology (DOST) partnered with Benita and Catalino Yap Foundation (BCYF) and SyCip Gorres Velayo (SGV) & Co. for the Philippine Innovation Week (PIW).

The PIW is organized by BCYF to highlight the role of innovation in social development. Presidential Proclamation no. 172, s. 2017 declared the third week of February as “Philippine Innovation Week.”

“Last year, during our celebration of the National Science and Technology Week, we took the opportunity to also re-announce the Philippine Innovation Strategy,” said DOST Secretary Fortunato T. de la Peña.

In 2007, there were four organizations that partnered together to craft an innovation strategy for the Philippines that was presented to then President Gloria Macapagal-Arroyo. It was called the “Philippine Innovation Strategy.”

The four pillars of this innovation strategy are: (1) investing in human capital development, (2) strengthening the business incubation and acceleration process, (3) re-engineering the innovation environment in the Philippines, and (4) upgrading the Filipino mindset.

“Among nine ASEAN countries’ ranking in the World Economic Forum, the Philippines ranked seventh, which is why there is a great challenge for innovation in [Philippine] education. So, in this phase of our low rank in education and economy, one of the things we made impact on recently is the addition of two years to our basic education program,” said Fr. Roderick C. Salazar Jr., SVD, chair of the Board of Trustees of St. Agnes Academy-Legazpi City.

In 2015, the DOST-Science Education Institute (SEI) launched the Access to Resources and Innovations in Science Education (ARISE) program which aims to provide a 21st century ecosystem of learning environments, education, information and communications technology resources, and innovations in support to the K to 12 Curriculum and Science, Technology, Engineering, and Mathematics (STEM) education. Part of this program is to introduce



Panel reactors in one of the plenary sessions of the Innovation Forum.



## SCIENCE NEWS

virtual reality (VR) and augmented reality (AR) to teachers as they can incorporate this innovation in their teaching methods. DOST-SEI sees that the VR and AR, which are initially introduced in gaming softwares and applications, can also be a more fun, exciting, and interactive way of learning among students.

“When it comes to research and development, there are many innovations currently being implemented already by the DOST under the National Harmonized Research and Development Agenda,” said DOST Undersecretary for R&D Dr. Rowena Cristina L. Guevara.

Some of these initiatives include programs on health like the Tuklas Lunas (Drug Discovery) program; the Food Innovation Centers to help micro, small, and medium enterprises; the Electronic Products Development Center for electronic product testing; space technology with the Diwata microsatellite; and the mass transport solutions like the Automated Guideway Transit, Hybrid Electric Train (HET), and the Hybrid Electric Road Train, among others.

The HET is a project aimed at increasing the current number of train sets being used by the Philippine National Railways. It is also intended to come up with an R&D output that will serve as a long-term solution to heavy

traffic congestions in many parts of the country, particularly in Luzon. Once adopted and commercialized, the HET is expected to bring more opportunities in the local manufacturing industry and reflect a positive impact in the Philippine economy.

“Innovation came from an idea. Innovation is innately human, focused on customers and achieved through collaboration. And the hardest part is taking innovative concepts to scale,” Katrina S. Macaisa, advisory partner of SGV & Co., defined innovation in business.

Indeed, a person is naturally innovative especially when he or she would be able to come up with an idea for making the impossible “possible”. One good example are the people behind the success stories featuring the proponents of DOST’s Small Enterprise Technology Upgrading Program (SETUP). They create unique and improved version of products in a wide range of industries like food, agriculture, furniture, handicrafts, and metals. The SETUP aims to support and sustain the growth of the micro small and medium enterprises (MSMEs) particularly in the regions. In fact, an e-commerce web application called “oneSTore.ph” was created to help DOST-assisted MSMEs reach a larger market.

Also a product of innovative minds is the DOST’s OneLab project. OneLab addresses

the issues that come with laboratory services in the country. Being DOST’s one-stop hub for laboratory services, it has already been useful for many and has proven its effectivity through a high client satisfaction rate. In addition, OneLab was also awarded the 2017 BCYF Innovation Award under the government category.

“It is very fortunate that BCYF and SGV have shown great interest in pushing innovation as a way of life in the country, particularly in the different productive sectors,” Secretary de la Peña lauded.

Meanwhile, BCYF Founder and Chair Antonio S. Yap stressed the importance of innovation among Filipinos, “Tayong mga Pilipino, dapat makatao tayo. Let us talk about personal social responsibility, personal governance, and personal innovation.”

The 2nd Philippine Innovation Week was launched at the “Innovation for Learning and Development” forum held on 19 February 2018 at the DOST-PHIVOLCS Auditorium. The key event of the PIW was the announcement of the 2nd BCYF Innovation Awards which recognizes individuals and/or teams who have led initiatives and have proven to transform the status quo in various sectors such as SMEs, the government, and education. The 2nd BCYF Innovation Awards will be held on 29 November 2018.



*Group photo during the Philippine Innovation Week.*



# DOST-CALABARZON helps upgrade Bacoor *tahong* processors & production

by Gilda S. de Jesus, DOST-Cavite PSTC

TRECE MARTIRES CITY, Cavite –Green mussels or “tahong” commonly grow in the coastal areas of Bacoor, Cavite thus harvesting and selling of fresh tahong is one of the major means of livelihood of the residents in the community.

Since “tahong” is grown abundantly in Bacoor City, the city government of Bacoor partnered with the Department of Science and Technology (DOST) to take advantage of the opportunity to improve the capability of the food processors. The City Government has been at the forefront in developing “tahong” into high value products.

In said partnership, the DOST committed to provide technical and financial assistance on the acquisition of equipment for “tahong” production and processing, training on food safety, and packaging of food products. The food processing center was conceptualized to assist the micro-entrepreneurs and food processors in the development of various food products using “tahong” and other raw materials available in the area.

DOST-CALABARZON and Bacoor LGU will set up a food processing facility to create a business platform for the members of Bacoor Producers Livelihood Cooperative and make the City of Bacoor known as “Tahong-Based Products Manufacturer” in the country. The cooperative will process raw materials into viable products at a minimum cost possible while earning a higher income.



DOST-CALABARZON Regional Director Dr. Alexander R. Madrigal (second from left) with Mayor Lani M. Revilla (third from left) and coop members.

Last 8 January 2018, the DOST-CALABARZON through Regional Director Dr. Alexander R. Madrigal and PSTC-Cavite Provincial Director Engr. Raul D. Castañeda entered into a Memorandum of Agreement with the City Government of Bacoor headed by the Honorable Mayor Lani Mercado-Revilla for the establishment of a food processing center. Local representatives and the head of the Bacoor City

Livelihood Center, Carmencita Gawaran, attended the ceremonial signing and turnover of the financial assistance for the project implementation.

Aligned to DOST's thrusts and mandate, this event and program marked the fulfillment of the mission of DOST and LGU Bacoor to assist the local “tahong” micro-entrepreneurs attain competitiveness.



Photos by Henry A. de Leon, DOST-STII



# DOST launches FEC program to move research into marketplace

by Raissa Jean A. Ancheta, DOST - PCIEERD

**TO HELP** push research projects towards commercialization, the Department of Science and Technology (DOST) launched on 19 February a lean startup training program dubbed the “Filipinnovation Entrepreneurship Corps” (FEC) in partnership with the De La Salle University, RTI International, and the USAID Science, Technology, Research and Innovation for Development (STRIDE) program.

Working with teams built around 10 DOST-funded principal investigators or RDI project leads, the FEC is an experiential training program for researchers to rapidly define the commercial and societal value of their research.

The FEC program is based on the successful US National Science Foundation I-Corps program which places researchers in teams led by entrepreneurs. Other members of the team are experienced industry mentors

and technology transfer officers who will create a business model canvas and conduct various customer interviews. The interaction of the members helps the teams to continuously refine their innovative products and ideas. It is intended that after the four-week program, the teams will be better equipped to attract additional funding and strategic partners to fast-track their project's adoption and impact on the Filipino consumer.

The FEC is supported by the DOST-Philippine Council for Industry, Energy, and Emerging Technology Research and Development represented by Russell M. Pili, chief of the Research Information and Technology Transfer Division. The first batch of FEC trainees had teams representing DOST's Industrial Technology Development Institute, Metals Industry Research and

Development Center, Philippine Textile Research Institute, and Food and Nutrition Research Institute; as well as DOST-funded researches at UP Diliman, UP Los Baños, and De La Salle University.

Principal Instructors of the FEC program are nationally certified instructors for the National Science Foundation's I-Corps. Dr. Jim Chung is the Associate Vice President for Innovation and Entrepreneurship at the George Washington University while Robert Storey is an Executive in Residence at the Johns Hopkins University and a Principal of the MVR Company which focuses on the assessment and creation of new ventures. Providing direct teaching support to participants is Adam Klich, an Innovation Advisor with RTI International and a former startup founder.



Participants discuss their respective topics during the FEC session. *Photo by DOST-PCIEERD*



# Creatives converge in DOST-Cebu backed “Crisscrossings”

by Engr. Tristan L. Abando, DOST-Cebu PSTC  
Photos by Create Cebu and ECCP Cebu

WITH THE hope of bridging art and the industry to develop the creative economy in Cebu, Department of Science and Technology (DOST) Cebu Provincial S&T Center gave its all-out support to the advocacy of CRISSCROSSINGS: Creative Convergence (CCX 2018) conducted on 12-14 January 2018 at Crossroads Mall Cebu and Materials Innovation Centre (MATIC).

Building on its first edition held in 2015, the 2018 reboot was a three-day gathering celebrating creative entrepreneurship, art, design, and maker culture in the Queen City of the South. It was a weekend dedicated to cultivating community, collaboration, and creative entrepreneurship. Creatives gathered for the love of their craft in this city to discuss, inspire, and celebrate art, design, and maker culture in Cebu.

One of the main highlights was the event called Creator's Market which displayed Cebuano products and services. It was also the venue for various talks and workshops geared towards advancing creative skills.

People from different disciplines and backgrounds came together to have meaningful conversations that concern the creative sector of Cebu in the event called “TAPOK Sessions.” In one of the sessions, the development of Cebu's



*Crisscrossings: Creative Convergence (CCX 2018) was organized by Create Cebu in partnership with DOST Cebu, European Chamber of Commerce of the Philippines Cebu and Materials Innovation Centre.*

Creative Ecosystem was discussed featuring distinguished panelists including DOST Cebu Provincial S&T Director Engr. Tristan L. Abando, British Council's Malaya del Rosario, and Create Cebu's Cecilia Martinez-Miranda. The panelists affirmed the importance of the

convergence of the initiatives of the government, industry, academe and the other key players in building a sustainable creative ecosystem in Cebu.

MATIC is DOST's primary support to the creative industry of Cebu. Developed under the DOST and the European Chamber of Commerce of the Philippines (ECCP) Materials R&D Program, MATIC serves not only as a repository of material swatches and resources but also as a venue of inspiration for design industries, a link to materials and design experts, and access to technology suppliers. It is a haven for product developers, designers, and students to touch, feel, and play around with materials.

Small and medium enterprises engaged in the production of furniture, home decors,



*The Creators' Market was one of the main highlights of CCX 2018 where Cebuano creative products and services were exhibited.*





fashion design and accessories, woven products, and bamboo-made products among others, will benefit from MATIC. The upgraded skills of artists and craftsmen will be instrumental in creating unique designs and products that will be more competitive in the world market.

The DOST and ECCP assisted women based community of macramé bag knitters of Toledo City, Cebu was also featured in CCX 2018. The group exhibited its products in the Creators' Market and the members also conducted workshop on macramé weaving. Macramé is a form of textile produced using knotting techniques.

Cebu's creative industry cracked into the export markets for many years featuring world-class handmade furniture and accessories by local artists. However, in the advent of technology, Cebuano's creativity shifted from traditional ventures to digital enterprises.

The organizers and partners of CRISSCROSSINGS 2018 believe that the Creative Industries can play a transformational role in driving local socio-economic growth and innovation within Cebu City and across the Philippines as a whole.



DOST Cebu Provincial S&T Director Tristan L. Abando, British Council's Malaya del Rosario, and Create Cebu's Cecilia Martinez-Miranda share their insights on how to build a sustainable creative ecosystem in Cebu during CCX 2018's TAPOK Session.



The Materials Innovation Centre (MATIC) of the DOST-VII Banilad S&T Complex is the new venue of CCX 2018. MATIC is DOST's primary support to the creative industry of Cebu.



The women knotters of Toledo City, Cebu conduct Macrame knotting workshop during CCX 2018. Macrame women knotters are assisted by DOST and ECCP through its community empowerment program.

In 2008, Cebu City was recognized by the British Council as the Creative Capital of the Philippines and is currently a member of the Southeast Asian Creative Cities Network, a network for creative cities and clusters in Southeast Asia. This network includes representatives from the cities, agencies, specialists, experts, groups and communities. The initial members include George Town

(Penang, Malaysia), Bandung (Indonesia), Cebu (Philippines), and Chiang Mai (Thailand). The network was informally founded in April 2014 in Chiang Mai and an MOU was signed in August 2014.

CCX 2018 intends to promote Cebu as an ASEAN destination for culture and the arts as well as contribute to its chances of being recognized as a UNESCO Creative City. This

was organized by Create Cebu, a non-profit, non-partisan initiative comprised of art-loving individuals who are passionate about urban revitalization and reclamation through art (in all its forms) and collaboration. This was made possible with the support of DOST-VII, Department of Trade and Industry-VII, A SPACE-Cebu, and the ECCP-Cebu.





## PH's first Makapuno Island to rise in Alabat, Quezon

by Myrrh Caithlin L. Gutierrez, DOST-CALABARZON

A LOT can be done when people work hand-in-hand.

Different government agencies converged and collaborated to establish the first Makapuno Island in the Philippines. On 16 February 2018, the Makapuno Island project was launched in Alabat Island, Quezon. "This project is not just a government project, but a project of the people," says Dir. Alexander Madrigal, regional director of the Department of Science and Technology (DOST)-CALABARZON.

Makapuno is a mutant coconut which is packed with gelatinous meat with little or no liquid. It is usually eaten as dessert or included as an ingredient in desserts.

Since 2009, DOST-CALABARZON and the Southern Tagalog Consortium for Industry and Energy Research and Development has been collaborating for the revitalization of makapuno industry in CALABARZON. After a number of planning and workshop sessions, the idea of a Makapuno Island was formed. This was made possible through the efforts of the DOST-CALABARZON, Philippine Coconut Authority (PCA IV-A), Department of Agriculture (DA-IV-A), Southern Luzon State University (SLSU), and the local government units of Alabat, Perez, and Quezon. Lending support to the project were the Department of Trade and Industry (DTI-IV-A), Department of Labor and Employment, National Irrigation Association, Office of the Provincial Agriculturist-Quezon, and the Office of Congresswoman Angelina Tan, the Makapuno Island project was kick-started. The launching ceremony was made more

exceptional by the presence of the Philippine Chamber of Commerce (PCC-Toronto), and the trade mission delegates from Canada who assessed the investment opportunities in Alabat Island.

The Makapuno Island Project aims to establish a Makapuno Island in Alabat Island, Quezon by initially putting up 110 hectares of makapuno plantation that would address poverty in the island by giving the farmers additional earnings and significantly contributing to the island's economy. The different government agencies will continuously join hands to support the island with Embryo Cultured Makapuno (ECM) seedlings and processing technologies. Also included in their plans is working on the island's branding to be known not only as a main source of makapuno but also coco sugar. To optimize the resources of the island, they are also looking into the potentials of integrated farming.

The efforts of the government agencies and the potential of Alabat Island were seen by the trade mission delegates. Asec. Maria Roseni M. Alvero, senior trade commissioner and Phil. consulate general of DTI-Foreign Trade Service Corps. (DTI) Toronto, Canada, presented her intentions of making Makapuno Island a model investment project wherein Overseas Filipinos can invest in their homeland's businesses. Her proposed project entitled "Transforming Overseas Filipinos (OFs) to Overseas Filipino Investors: The Philippine Makapuno Industry and Agribusiness Investment Promotion Program in Alabat Island, Quezon" aims to

launch a well-coordinated, harmonized and sufficiently funded export and investment campaign targeting the Filipinos living abroad. By August 2018, the project will be launched in Toronto, Canada.

Vermelyn O. Evangelista, technical supervisor of Philippine Coconut Research and Development Foundation, assured the beneficiaries that it will continuously extend their research and development of ECM. She also discussed the processing technologies that the island can later use for their makapuno products. Meanwhile, Erlene Manojar, regional manager of PCA IV-A declared PCA's support by assuring the beneficiaries that "from production, processing, up to marketing, PCA will provide the help Alabat Island will be needing".

Mayor Fernando L. Mesa of the municipality of Alabat delivered the island's positive response by thanking all the agencies that made the Makapuno Island possible. He assured everyone that they will work hand-in-hand for the progress of the Island.

The program concluded with the signing of a MOA with the partner government agencies, a commitment board signing of the Adopt-a-Makapuno Tree project, and declaration of support from the different participating agencies.

Lastly, a ceremonial planting of makapuno seedlings was held at Brgy. Villa Jesus Weste. Rolando Mesa and Rene Mesa, coconut farmers, gave their testimonies about makapuno farming and how ECM can be of great help to the island economy.



# UP PLANADES embarks on settlement development model as science foundation project

by Rodolfo P. de Guzman, DOST-STII

WITH THE recent approval of the Department of Science and Technology (DOST), the UP Planning and Development Research Foundation, Inc. or UP PLANADES is now recognized as a science foundation.

The certification was formally turned over on 9 March 2018 at the office of the DOST-Philippine Institute of Volcanology and Seismology (PHIVOLCS), an attached agency of the DOST, with the presence of DOST Secretary Fortunato T. de la Peña, DOST Undersecretary for S&T Services Dr. Carol M. Yorobe, and UP PLANADES President Dr. Mario R. de los Reyes. Magdalena B. Villadoz, Project Development Officer IV, Science and Technology Foundation Unit, OUSEC-STs and Corlita G. Canilao, senior administrative assistant of the DOST.

*The certification of UP PLANADES as a science foundation will further contribute to the goal of strengthening R&D initiatives in the country which will serve as the backbone of industries as potent instrument of change and inclusive growth similar to other highly industrialized economies in Asia and in the world.*



**DOST certifies UP PLANADES as science foundation.** The DOST recently certified the UP PLANADES as a science foundation that marked the start of its partnership in using science and technology particularly in urban planning for new growth areas. Shown receiving the certification from DOST Secretary Fortunato T. de la Peña (2nd from left) is UP PLANADES President Dr. Mario R. de los Reyes (center). Others in photo were (L-R) DOST Undersecretary for S&T Services Dr. Carol M. Yorobe, Magdalena B. Villadoz, Project Development Officer IV, Science and Technology Foundation Unit, OUSEC-STs and Corlita G. Canilao, senior administrative assistant of the DOST.

Photo by Gerardo G. Palad, DOST-STII



As a foundation, the UP PLANADES submitted a proposal for its S&T Program titled “Formulation of a Settlements Development Model for New Growth Areas in the Philippines.” The initial project, called “Projecting Settlements Development in New Growth Areas in the Philippines,” is envisioned to come up with a model on how settlements develop in relation to new growth areas using science and technology.

The project addresses the problem on growth of unplanned settlements, urban sprawl, and the mismatch of the location and number of housing projects with the housing demand.

With a P17.8 million funding, the project will run for two years. Principal activities will include the following: analysis of historical population growth and spatial distribution, identification of factors affecting urban growth and urbanization, analysis of urban housing growth, determination of new growth areas in the Philippines, projection of housing supply and demand in the new growth areas, development of a GIS-based settlement model, estimation of projected housing demand, projection of financing requirements of both government and private housing programs, integration in settlements model, validation of settlements model, development of training modules, and training on the use of the models.

The project was referred to the DOST-National Research Council of the Philippines that evaluated the foundation's performance based on its charter and mandate. The UP PLANADES got a total point score of 85% based on the DOST criteria.



Photo from <http://www.archivisionmodels.com>

The UP PLANADES is a non-stock, non-profit foundation established in 10 May 1977 engaged in research, consultancy and extension services, academic development, and training in environmental, urban and regional planning and related disciplines.

In 1978, the foundation was certified tax-exempt by the DOST. The foundation is also a NEDA/COFILCO-accredited firm with FILCON Consultant. The UP PLANADES has since operated as a private entity engaged in promoting studies and applied research and is providing technical assistance through consultancy/extension services to both government and non-government entities. Part of its activities includes support for scholarships and professorial chairs and the development of publications and other related areas.

#### **DOST supports science foundations**

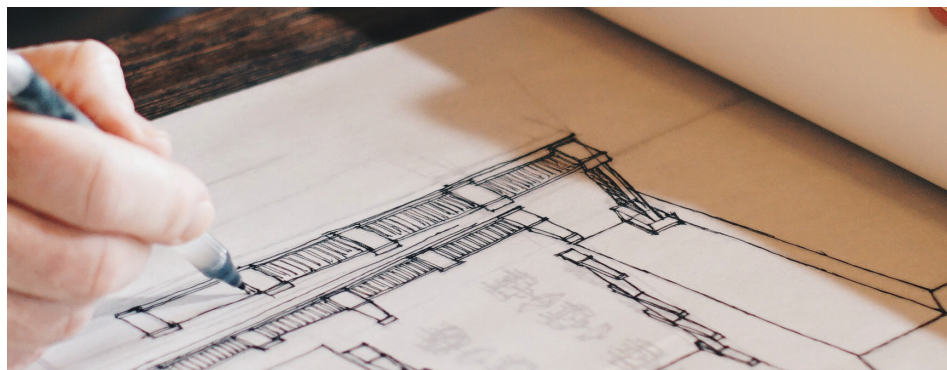
The DOST, with its thrust to promote research and development (R&D) programs and initiatives in various fields of discipline, has for many years supported the growing number of science foundations in the country. These institutions serve as drivers of economic development in the country with the R&D programs and innovations they introduce in agriculture, engineering, health science, energy, industry, physical science, social science, and humanities.

Science foundations are entitled to several benefits such as 1) tax exemption of contribution,

2) exemption of income tax, 3) integration and availment to DOST programs, and 4) exemption from payment of customs duties for the importation of scientific instruments of apparatus.

In fact the number of certified science foundations in the country has steadily increased from 34 in 2013 to 44 in 2017. This shows the important role of science foundations in pushing economic growth and becoming a catalyst of change.

Some of the science foundations certified by the DOST include Bonifacio Art Foundation, Inc. for its Mind Museum; De La Salle University Science Foundation, Inc.; El Observatorio de Manila, Inc.; Foundation for the Philippine Progress, Inc.; HARI Foundation, Inc. with the Hyundai New Thinkers Circuit; Los Baños Science Community Foundation, Inc.; Philippine Foundation for Health and Development, Inc. for the Divine Mercy Program; Philippine Institute of Pure and Applied Chemistry, Inc.; Xavier Science Foundation, Inc. for its Climate-Smart Organic Research Farm; Marine Environment and Resources Foundation, Inc.; OML Center for Climate Change Adaptation & Disaster Risk Management Foundation, Inc.; PSHS Foundation, Inc.; Philippine Sugar Research Institute Foundation, Inc.; UP Engineering Research and Development Foundation, Inc.; and the Yaman Lahi Foundation, Inc.-EAC.







*DOST Secretary Fortunato T. de la Peña explains some of the provisions needed for the Balik Scientist Act with Senator Paulo Benigno “Bam” Aquino IV and Senator Maria Lourdes Nancy S. Binay during the Bicameral Meeting held on 06 March 2018 at the Senate of the Philippines in Pasay City. Photo by Henry A. de Leon, DOST-STII*

## Balik Scientist Act approved in bicam final reading

*President Duterte expected to sign it into law, Senator Aquino says*

by Allan Mauro V. Marfal, DOST-STII

**THE BALIK** Scientist Act that would give more incentives to returning Filipino scientists and engineers is expected to be enacted into law next month. The Act, also known as Senate Bill 1533, was approved in the third and final reading at the Senate and House of Representatives during the Bicameral Conference on 06 March 2018 at the Senate of the Philippines in Pasay City.

Senator Paulo Benigno “Bam” Aquino IV, principal author in the Senate, shared that both Houses are expecting that President Rodrigo Roa Duterte will sign the Act into law within the next two months. His Lower House counterpart, Bohol second district representative Erico Aristotle C. Aumentado, was equally optimistic.

“Upon transmittal of all the documents to Malacañang which will take few weeks, then in 30 days if there is no veto message, we expect that he will sign this and it should be a law by April or May. I don’t see any reason for the President (Duterte) not to approve this law. We all know that he would like to see all greatest Filipino minds to stay in the country to contribute to economic development,” said Senator Aquino IV.

The Balik Scientist Act seeks to institutionalize the Balik Scientist Program of the Department of Science and Technology (DOST) which encouraged some of our scientists to return and contribute to research that will help address development gaps in the Philippines.

Under this bill, a returning scientist can enjoy various compensations that include: tax and duty exemptions to importation of

professional equipment and materials, free medical and accident insurance covering the award period, reimbursement of expenses for baggage related to scientific projects, and even exemption from “renouncing their oath of allegiance to the country where they took the oath.”

Aside from that, a Balik Scientist can also participate in DOST’s Grants-in-Aid research and development projects with an initial lump sum research subsidy of P500,000 for a short-term program; P500,000 to P2 million for a medium-term program; and P2 million for the long-term program, in accordance to relevant government rules and regulations and the need of the program involved.

The benefits also include special working and non-working visas, a round-trip class airfare from a foreign country to the Philippines, exemption from local travel tax, and DOST-subsidized visa application.

Also under the bill, long-term Balik Scientist awardees can enjoy relocation benefits, such as support in securing job opportunities for the spouse of the awardee, and admission support for the children of awardees in preferred schools, relocation allowance and monthly housing or accommodation allowance, and funding for the establishment and development of a facility or laboratory.

“Institutionalizing the Balik-Scientist Program of DOST is one way of showing that we recognize the importance of our scientists and engineers abroad, especially on how their

knowledge, expertise, and experience could help a lot in order to address some of the pressing problems of different areas in the country, particularly in the urban part,” said Sen. Aquino.

Sen. Aquino also shared that Sec. de la Peña has been supporting this bill for years, since he was an undersecretary of DOST.

“Malaking bagay na mapalakas natin itong Balik-Scientist program kasi may mga area coverages tayo na kulang na kulang tayo ng experts. Kagaya na lang sa space technology and artificial intelligence na ngayon pa lang nag-uumpisa, mahalaga na mayroon tayong enough human resources upang tumulong sa research and development pagdating sa mga field na ito” said Sec. de la Peña.

(It is very crucial to strengthen the Balik-Scientist Program of DOST because we have areas that lack experts. Examples are space technology and artificial intelligence which are just starting. It is very crucial to have enough human resource in these fields to help us in conducting various research and development projects.)

Also under the bill, a non-bachelor’s degree graduate but with extensive experience in important fields can also be considered a Balik Scientist and can apply for the program.

The bill also states that the Balik-Scientist Program will prioritize experts in the fields of agriculture, drug discovery, information and communications technology, and disaster risk reduction management.



# DOST bats for first “smart farm” in PH

by Raissa Jean A. Ancheta, DOST - PCIEERD



Partners from University of the Philippines Diliman and Los Baños with representatives from DOST and DOST-PCIEERD during the groundbreaking ceremony of the Nursery of Indigenous and Endemic Plants at DOST-ASTI in Quezon City. **Photo by DOST-PCIEERD**

**THE DEPARTMENT** of Science and Technology-Philippine Council for Industry, Energy, and Emerging Technology Research and Development (DOST-PCIEERD) put up its stakes to fund the country’s first “smart farm.”

The “smart farm” is a facility for the Smart Plant Production in Controlled Environments (SPICE), a P128M program that will promote urban farming and high-tech plant conservation. It will be housed at the Nursery of Indigenous and Endemic Plants located in DOST-Advanced Science and Technology Institute compound in Quezon City. Teaming up to develop the SPICE are the UP Diliman Institute of Biology and Electrical and Electronics Engineering Institute, and UP Los Baños Institute of Biology.

This program aims to lead the research and development for the design of a stand-alone urban farm system and establish protocols for micropropagation, cryopreservation, and

nursery management of rare, endangered, and economically valuable native plant species.

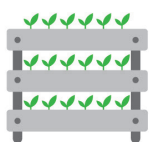
“The core of this project is not only the development of new technology, but also, on a macro perspective, to ensure that we can protect our country’s rich biodiversity,” DOST Undersecretary for R&D Dr. Rowena Cristina L. Guevara said.

Modern farming methods like vertical farming, micropropagation, cryopreservation, and hydroponics will be practiced to grow native plants in an environment wherein the climate, the lighting, and the irrigation system can be monitored, controlled, and changed real-time through the use of electronics, sensors, and automation.

“My idea of internationalization is exporting our own ideas, that foreign scientists will come to the country to study trees that are endemic here. SPICE is an innovation project,” remarked UP Executive Vice President Dr. Teodoro Herbosa.

National Scientist and UP Professor Emeritus, Dr. Edgardo D. Gomez shared his experiences in biology and commended the team for initiating the project, saying that “This (SPICE) will be a world-class institute.”

Aside from the technical features of the project, the facility is envisioned to include a “living laboratory” where visitors can see the various technologies employed and a store where they can buy fresh vegetables grown on-site.



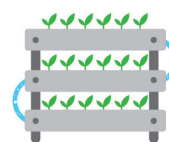
VERTICAL FARMING



MICROPROPAGATION

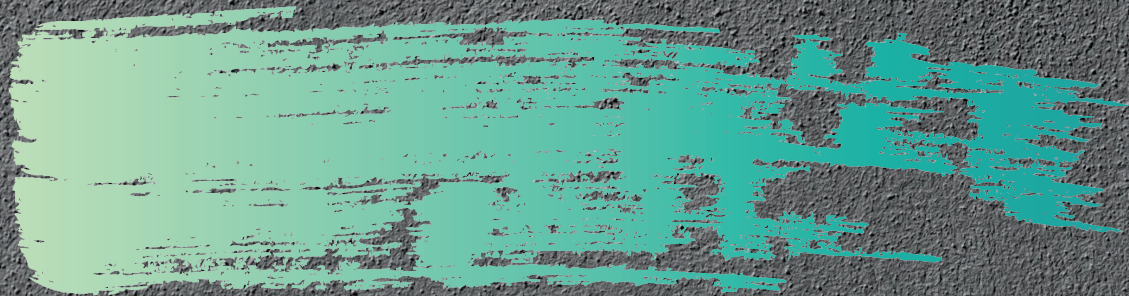


CRYOPRESERVATION



HYDROPONICS





# COLORS OF SCIENCE





# SPECTRUM: SEEING SCIENCE THROUGH COLORS

By Louella Labasbas, *DOST-STII*

Graphics by Josemaria Zarraga, *DOST-STII*

*"Colors are light's suffering and joy."*—Johann Wolfgang von Goethe

**H**ue, iridescence, luminescence, tint, and pigment—they may vary in denotations but they all refer to color. Imagine you are holding two different pictures: one is iridescent and the other is in grayscale. Isn't it noticeable that the former is more appealing than the latter? This idea can certainly be agreeable to many simply because color creates life. Color creates stories. As they say, a picture is worth more than a thousand words; and when colors are added to the picture, it becomes more meaningful for the emotion.

Colors make people appreciate and interpret objects. More so, the concept of hues has been instilled in us even at the earlier stage of learning. Children are taught to color properly, to distinguish one color from another, and to use color based on its appropriateness. Little do we know that science imparts a vital factor in perceiving them. Through science, men truly discover the truth and mystery in colors.

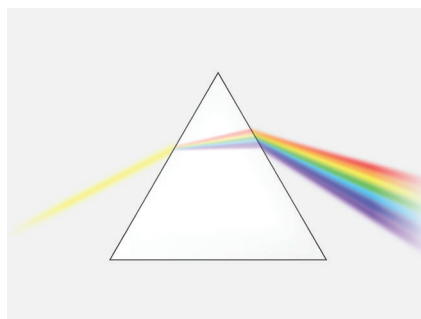


Image showing how light is refracted when it passes through a prism.

## The Brainchildren

The curiosity of mankind to the existence of color started when Aristotle, a Greek philosopher, postulated that God sent down color from the heavens as celestial rays, by which the colors represent four elements: earth, fire, wind, and water. These four elements are surrounded by external ring energies represented by green, blue, and violet, respectively.

For over 2000 years, the colors remained to be associated with elements until 1666 when Sir Isaac Newton, an English physicist and mathematician,

established the scientific methods in determining colors using sunlight and prisms.

In one of his notable works entitled *Opticks*, Newton demonstrated that when a light passes through a prism, it creates a visible spectrum that can be perceived by the naked eye. He identified these colors as those found on a rainbow—red, orange, yellow, green, blue, indigo, and violet. Newton's idea has paved the way for several scientific breakthroughs in optics, physics, chemistry, and biology and has also been taught in most science classes.

Later in 1794, John Dalton, the father of atomic theory, described his perception in colors as different when he saw a red wax appearing to have the same color as a laurel leaf. Dalton hypothesized that the fluid within his eyes affected his perception. Having great curiosity, he supported his hypothesis through an examination of his eyeball which then revealed that he was suffering from deuteranopia or red-green color blindness, a genetic condition in which blue is the only rich color that can be perceived.

Take it from Mark Zuckerberg, co-founder of Facebook, who is also suffering from deuteranopia. "Blue is the richest color for me; I can see all of blue," Zuckerberg explained. This simply concludes why Facebook is blue.

The discovery of various types of color vision deficiency, through the use of Ishihara plates, has been a major leap in the scientific community as it reveals error in human genetics. The problem of differential color perception strongly affects the way people view their surrounding and importantly do science.



*"...if the sun's light consisted of but one sort of rays, there would be but one color in the whole world."*

Sir Isaac Newton, *Opticks*

Image of different, colored tubes of light



## The Psychology of Color

Science has always recognized the connection between colors and human behavior by which each color can represent a specific personality. Likewise, Johann Wolfgang von Goethe's Theory of Color supports the idea that human perception and/or response to colors is highly subjective. Red, for instance, may be one's favorite but another may despise it. Some may see red as exhilarating and fun, while others may see it aggressive and rude.

The accurate processing of colors is strongly controlled by collaborative work of the eyes and brain. Colors, antithetically, are not limited to physical perception only as science expresses that color is a form of light, and light is energy. It means that color can be determined even without seeing; instead, sense of touch can be used as well. As an example, blind people are sensitive to color psychology and can identify colors by using their fingertips.

In psychology, colors do not seem to be similar on how eyes perceive it; instead, colors have their unique energy effect on the body. Likewise, four psychological primary colors namely red, blue, yellow, and green contribute positive or negative psychological effects and are considered universal regardless of their saturation, tint, or tone. These colors also govern the body, the mind, the emotions, and the essential balance among the former three.



Purple Heart plant  
(*Setcreasea pallida*)



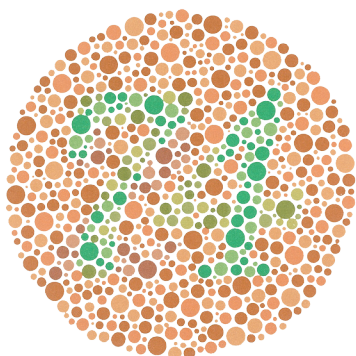
Cuttlefish  
(*Sepia officinalis*)



Poinsettia  
(*Euphorbia pulcherrima*)



Chameleon  
(*Chamaeleo chamaeleon*)



### Simple Color Blindness Test

Example of an Ishihara color test plate. The number "74" should be clearly visible to viewers with normal color vision. Viewers with dichromacy or anomalous trichromacy may read it as "21", and viewers with monochromacy may see nothing.

(Taken from the Ishihara color blindness test)

## The Biology of Color

Living organisms, regardless of size and form, produce their unique colors which enable them to adapt and proliferate to their corresponding environment whether they are thriving on different biomes and laboratory-maintained conditions. These colors are produced by specialized cells that are found within animals, plants, microorganisms, and even humans.

Other technological advancement in scientific research allows in-depth investigation in the fields of genetics, phylogeny, and ecology such as identifying unknown organisms, analyzing mechanisms, and executing methods.

For example, plants produce flowers with different petal coloration in order to attract pollinators like bees and birds. Majority of terrestrial plants have green leaf coloration while some have pigmented leaves such as the purple-heart plant (*Setcreasea pallida*) and mayana plant (*Coleus blumei*). Special plant groups also possess transitional leaf coloration depending on climate such as poinsettia (*Euphorbia pulcherrima*) and maple trees.

Animals, in addition, possess unique coloration patterns that promote reproductive success and offer protection and survival. Camouflage uses nature's color to conceal forms by creating optical illusions to potential predator and prey. Interestingly, this impressive ability is commonly exhibited by cuttlefish (*Sepia officinalis*), stick insect (*Phasmatodea* sp.) and chameleon (*Chamaeleo chamaeleon*) whereas

the broad-tailed hummingbird (*Selasphorus platycercus*) has iridescent throat which dramatically changes from black to magenta depending on the angle of illumination.

Human (*Homo sapiens*) skin color clearly demonstrates the significance of coloration when it comes to adaptation to sunlight, particularly ultraviolet radiation. Variation in skin complexion is caused by amount of melanin. People who have darker complexion usually live in areas where heat is concentrated like those countries near the equator. On the other hand, people who have lighter complexion commonly thrive in areas where heat is diffused such as in countries near northern and southern poles of the earth.

Science is truly a fun space as it explores a wide array of learning including colors. The language of colors is effective in enforcing an underlying concept. Far from being just a pigment, colors communicate in every beholder's perception as these affect the mind and emotion.





## Living on Dyeing: DOST-PTRI launches new facility, programs for its 51st anniversary

by Jasmin Joyce P. Sevilla, *DOST-STII*  
Photos by Henry A. de Leon, *DOST-STII*

“Natural dye is worth dying for.”

These are the words of Dr. Celia B. Elumba, director of the Department of Science and Technology-Philippine Textile Research Institute as she welcomed guests and participants during the launching of the Technology Business Incubator (TBI) Facility for Natural Dyes on 30 January 2018. This multi-million facility for producing powdered natural dyes is just one of the new programs and initiatives that DOST-PTRI has planned out as it embarks on its 51st anniversary this year.

According to Dir. Elumba, the TBI facility aims to provide a technical support to micro, small, and medium enterprises (MSMEs), start-ups, and other social entrepreneurs in enhancing their textile/natural dye-based businesses.

“We are not competing with private sectors. What we want is to offer our facility to starting entrepreneurs for them to prototype their samples. That will give them the confidence they need to grow their businesses,” she emphasized.

Further, DOST-PTRI still carries its flagship tagline “Textiles Empowering Lives Anew” (TELA) as it continues to uphold its promise of using textiles as an instrument in improving the livelihood of Filipinos

in the countryside and textile workers of the nation. As DOST-PTRI enters a new milestone this year, DOST-PTRI infused TELA with the theme “Concept to Cloth” which centers on providing opportunity to the government, academe, and private sectors to translate ideas into materials, processes, or solutions leading to more prospects and impact in the textile sector.

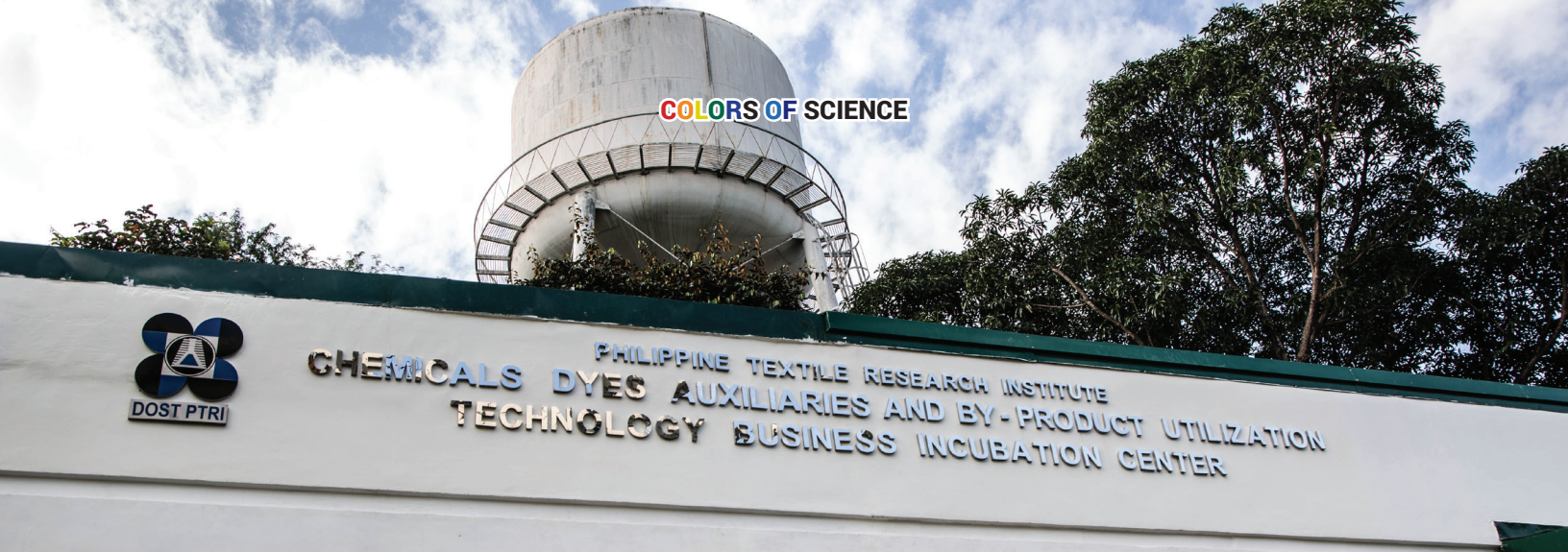
In addition, DOST-PTRI spearheaded an interactive workshop entitled “Drafting Weave Designs” on the same day of the launching of the TBI facility. Invited participants, exclusive of designers and social entrepreneurs, were guided by the Institute’s master weaver, Josie Garlitos. The participants were introduced to the basic concepts of handloom weaving to help the designers translate their weave ideas into a form that will be easily understood by local weavers.

Dir. Elumba, who also joined the workshop, explained that much of the local weavers are experienced on their craft but are not able to effectively communicate the process to the designers and other stakeholders. “It is important to have a common language between weavers and designers when it comes to conceptualizing weave patterns so that both parties will be on the same page,” she said.

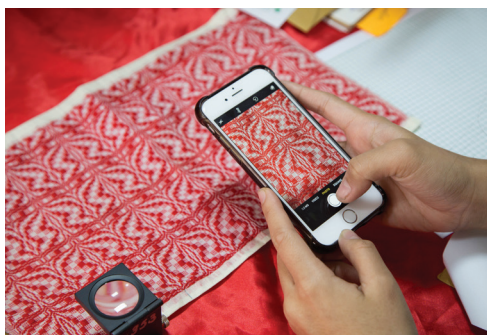
### Photo caption:

(Top right) The newly-built TBI facility of the DOST-PTRI features the following equipment (left to right): a first generation spray dryer, extraction chamber with a 300 L capacity, and a dyeing machine with a 600L capacity. (Bottom): A row of skeins that used natural powdered dyes. Skeins are processed to form threads and yarns used on garments and other textile products.





*(Left) Assistant Secretary for DOST-International Technology Cooperation Unit Leah J. Buendia (leftmost), in lieu of DOST Secretary Fortunato T. de la Peña, joins PTRI Director Celia B. Elumba (right) as they officially launch the TBI facility. (Right) Powdered Nat Dyes or natural dyes made from natural ingredients such as talisay, mahogany, coffee, and yellow ginger.*



Twinkle Ferraren, designer and owner of Style Isle, a local clothing brand, shared her insights about the weaving workshop. “I had difficulty replicating a design in mind. Weaving requires skills that’s beyond my capability as a designer. This is helpful because it gave me an idea on how the process works,” she said.

The workshop is also beneficial in the perspective of Karen Sosoban, a marketing officer from Tesoro’s, a handicraft store. She said that understanding the basic techniques in handloom weaving made her appreciate how handloom fabrics and handicrafts are made. “If we know about the intricacies behind weaving, we can appreciate it more. That way, we can promote and sell the product better,” she added.

DOST-PTRI lined up the following activities for 2018 anchored on the theme “Concept to Cloth”:

**The Perfect Fit Project (Textile Product Development Center)**-aimed to be the first laboratory in the country to aid textile industries in prototyping their products for evaluation/assessment.

**ArtisTELA** - a design competition for 2018 to promote creative innovation in textiles.

**Philippine Silk Road Program** - a multi-project program aimed to address the low production capacity in silk yarn production.

**Design Competition for Government Uniforms** - aimed to produce prototypes for selected government agencies that will incorporate Philippine Tropical Fabrics and local weaves in the design.

**TELA Yarn Production and Innovation Center in Miag-ao, Iloilo** -the first micro-scale yarn spinning facility to support Philippine Tropical Fabrics production

**Concept Presentation of the Proposed DOST-PTRI “Textile Design Hub”** a physical and virtual space that brings together textile stakeholders to strengthen the local textile industry

For more information on DOST-PTRI programs and activities, please email [ptri@ptri.dost.gov.ph](mailto:ptri@ptri.dost.gov.ph) or check out TELA Pilipinas on Facebook.



# Food colorants within acceptable levels, DOST-FNRI study shows

by Jund Rian A. Doringo, DOST-FNRI



Image from: <http://balanceblog.bistromd.com/>

**F**ood coloring, or color additive to some, is any substance that enhances the appearance of food. It is widely used in commercial food production and domestic cooking as it maintains or improves the appeal in processed food, drinks, and condiments.

Moreover, food colorant is used to add colors to colorless food, avoid color loss due to current or changing settings, and provide color consistency to food.

Despite proper regulation of food coloring, reports show that high exposure to certain additives can result to adverse effects to health.

A study by the United Kingdom Food Standards Agency in 2007 revealed that consumption of foods containing food coloring can increase hyperactivity among children.

In some events, toxicity of food coloring may result in injuries, even death.

The Department of Science and Technology - Food and Nutrition Research Institute (DOST-FNRI) evaluated the post-regulation safety of food additives based on current consumption patterns to estimate the exposure and describe the risk of the Philippine population to certain food colorings.

The DOST-FNRI study evaluated food colorings most extensively used in the food industry—tartrazine and sunset yellow.

Tartrazine and sunset yellow are synthetic yellow azo dyes that are mainly used in desserts and sweets, beverages, snacks, condiments, and spreads, among others. These food colorings may be responsible for causing certain allergic reactions.

Results of the study showed that exposure to tartrazine and sunset yellow are within Acceptable Daily Intake (ADI) across the general population. This was after comparing the exposure estimate, using the maximum levels of food additive by the Codex General Standards for Food Additives and the individual food consumption data from the 2008 National Nutrition Survey, with the relevant ADI.

More advanced exposure assessment can be considered using actual use of food additives in the food industry.

Food additives are helpful in keeping nutritious foods palatable and marketable. Keeping their ADIs across the general population especially among children can result to a win-win situation.

For more information on food and nutrition, contact:

**Dr. Mario V. Capanzana, Director, Food and Nutrition Research Institute**  
Department of Science and Technology, General Santos Avenue  
Bicutan, Taguig City

**Tel/ Fax Number:** 8372934 and 8373164

**Email:** [mvc@fnri.dost.gov.ph](mailto:mvc@fnri.dost.gov.ph), [mar\\_v\\_c@yahoo.com](mailto:mar_v_c@yahoo.com)

**Website:** [http:// www.fnri.dost.gov.ph](http://www.fnri.dost.gov.ph).

**FNRI Facebook page:** [facebook.com/FNRI-DOST](https://facebook.com/FNRI-DOST)

**FNRI Twitter account:** [twitter.com/FNRI-DOST](https://twitter.com/FNRI-DOST).

A photo of Tartrazine, a synthetic lemon yellow AZO dye primarily used as a food coloring. Photo from [www.baronmethod.com/the-truth-about-tartrazine-yellow-5-food-coloring](http://www.baronmethod.com/the-truth-about-tartrazine-yellow-5-food-coloring)





# Colors that could save your life

by Jasmin Queen B. Mikunug and Framelia V. Anonas, *DOST-STII*

Colors are something we see everyday. Each color symbolizes something- perhaps a trait, emotion, or even a warning. Colors are actually very essential and contribute to preventing accidents or reducing disaster risks. It is used worldwide as an instrument to help people easily identify signs during dangerous situations. Residents living near mountains, shores, or nuclear power plants use colors efficiently. In the Philippine setting, agencies of the Department of Science and Technology (DOST) such as the Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA), Philippine Institute of Volcanology and Seismology (PHIVOLCS), and Philippine Nuclear Research Institute (PNRI) released color-coded rainfall warnings, volcano status, and nuclear radiation respectively.



## What's the weather's color?

The DOST-PAGASA uses yellow for possible flood, orange for threatening flood, and red for serious flood. In the yellow advisory, residents are required to monitor the weather condition. For orange, residents should be prepared to evacuate the affected area. For the red warning, it means that emergency status has been declared and evacuation should be done at once.

Colors are also used in DOST-PAGASA's rainfall warning. Yellow Rainfall Advisory means "community awareness"- that flooding is possible in low-lying areas and near river channels. Orange Rainfall Advisory is an alert which corresponds to "community preparedness" – flooding is threatening in low-lying areas and near river channels. Red Rainfall Advisory is an emergency corresponding to "community response"-that severe flooding is expected so everybody should take the necessary precautionary measures.



### Yellow Rainfall Advisory

Rain Measurement:  
**7.5 - 15mm Rain,**  
observed in 1 hour and expected to  
continue in the next 2 hours

What to do:  
**Monitor the weather condition**

Flood Possibility:  
**Flooding is possible**



### Orange Rainfall Advisory

Rain Measurement:  
**15 - 30mm Rain,**  
observed in 1 hour and expected to  
continue in the next 2 hours

What to do:  
**Be alert for possible evacuation**

Flood Possibility:  
**Flooding is threatening**



### Red Rainfall Advisory

Rain Measurement:  
**More than 30mm Rain,**  
observed in 1 hour and expected to  
continue in the next 2 hours

What to do:  
**Evacuate**

Flood Possibility:  
**Serious flooding expected in low  
lying areas**



# Colors for volcanoes

Meanwhile, DOST-PHIVOLCS uses red, yellow, and green in determining the status of the volcanoes located in the country.



Red is used to identify active volcanoes



Yellow is used to identify potentially-active volcanoes



Green is used to identify inactive volcanoes



As of December 2017, there were 23 active volcanoes in the Philippines including Mayon Volcano which last erupted from January to March 2018.

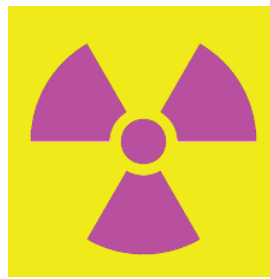
# The changing colors of trefoil



International ionizing radiation trefoil symbol



Early ionizing radiation symbol (1946 at the University of California in Berkeley)



Yellow and magenta ionizing radiation trefoil used in the US



ISO 21482 high-level sealed-source ionizing radiation symbol

The DOST-PNRI does not have particular color coding but uses the international radiation symbol, also known as the trefoil to indicate radioactivity. The first trefoil was magenta set on a blue background. It was first used in 1946 at the University of California, Berkeley Radiation Laboratory.

Why magenta? According to Nels Garden, head of the Health Chemistry Group, the magenta color with the particular shade of “Martin Senour Roman Violet No. 2225” was selected because “it was distinctive and did not conflict with any color code that we were familiar with. Another factor in its favor was its cost. The high cost will deter others from using this color promiscuously.”

On the blue color, Garden explained that they used blue because very little blue color was used in most of the areas where radioactive work was being done.

However, in 1948, the blue background became highly unacceptable because it faded fast and blue was not usually used in warning signs. The Oak Ridge National Lab was tasked to come up with the new color combination. The magenta symbol was cut out and stapled on cards of different colors. The final combination was finally

decided after testing outdoors at a distance of 20 feet. A committee selected the magenta on yellow as the best combination.

The American National Standards Institute, by the late 1950s, codified the version of the warning sign used today. Currently, regulations also permit the use of black as a substitute for magenta; black on yellow is actually the most common color combination outside of the U.S.

In 2007, the International Atomic Energy Agency (IAEA) and the International Organization for Standardization (ISO) adopted the new symbol that will supplement the traditional trefoil symbol. It is triangular with a red background and heavy black borders. Inside the triangle are figures of a black trefoil emitting waves of radiation (suggesting the presence of radiation), a black skull and crossbones (danger warning), and a running figure with an arrow pointing away from the scene which suggests that people should avoid the labeled material. The additional symbol is generally not visible but is usually used in internal components of devices that contain radiation sources. The symbol is meant to warn and stop anybody who attempts to disassemble such device.

Reference: <https://www.ornl.gov/ptp/articlesstories/radwarnsybstory.htm>



# Colors of Medicine

by Louella D. Labasbas, *DOST-STII*

It is a sparkling dream to become a medical practitioner, a physician perhaps. The field of Medicine, universally speaking, is an interesting concept because it touches the value, intricacy, and arts of life. It is in the field of Medicine also where time is being battled and defied. In hospitals, medical professionals beautifully wear their uniform in white while green appears to be the dominant color of their uniform during surgeries.

When someone is not feeling well, medicine is always needed as it brings both comfort and healing. Medicines, whether organic or synthetic, are the universe's magic potion in vanishing wide array of discomfort – from simple cough, back pain, and headache, to chronic ones like tuberculosis, HIV, and cancer. They come in different forms, sizes, shapes, and colors.

But, do you ever wonder why physicians wear white and green uniforms? Why do medicines vary in colors?

Interestingly, these colors are not just randomly chosen by professionals in the medical society to promote unique fashion. In the same way, pill colors are not meant for aesthetic purposes only. Each color represents branding and specificity.

distinguish anatomical part. At the same time green relaxes the eyes of surgeons during operations.

As William Ludlow said, "White is negative; the convalescent needs the therapeutic reaction of the positive colors that nature has spread so lavishly for her children."

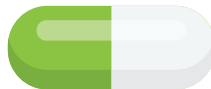
The introduction of green was a part of the "color therapy" in the hospital culture.

"Our eyes were made to find rest and contentment in soft greens, pale blues, an occasional touch of red, but above all, the glorious golden yellow of the sunshine," Ludlow added.

In retrospect, hospitals followed the dominance of green in different areas such as walls, floors, and medical equipment. Green, in medicine, had become the standard of the modern hospital up to present time.



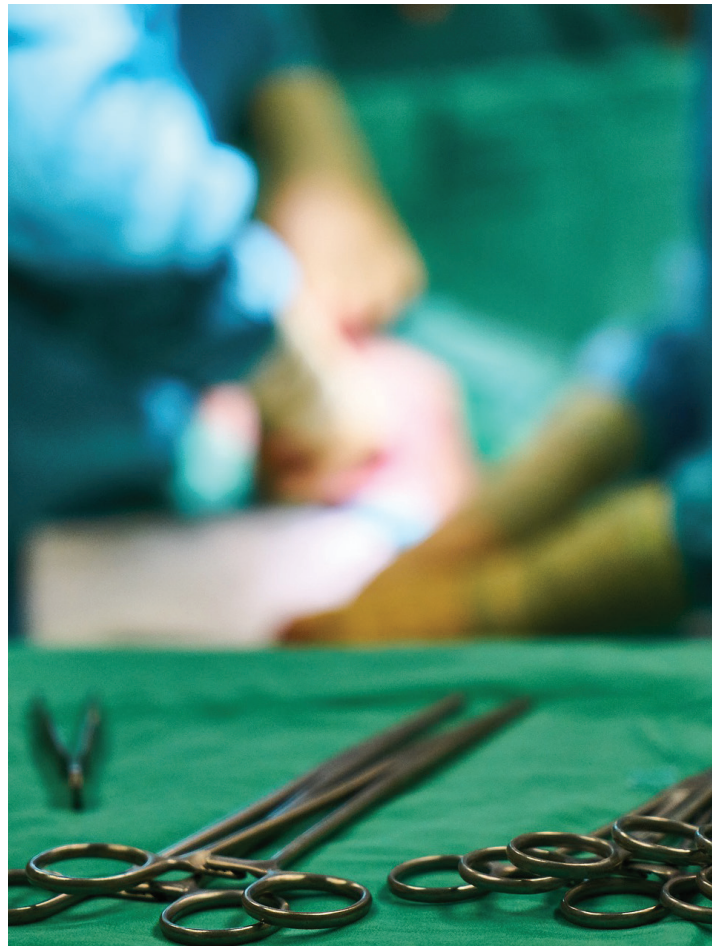
## The secret in green



It is not a surprise that physicians, nurses, and other medical professionals commonly wear their uniforms in white because this color signifies both cleanliness and health. Beyond that idea, the psychological significance of white makes it more meaningful when it comes to medical professionals' uniform.

Patients tend to be highly dependent on their respective physicians, in terms of emotional, physical, and psychological considerations knowing that these professionals know the best solution in every clinical case that they encounter. Likewise, the dominance of white in uniform speaks the language of security in the hope that patients will recover abruptly through the meticulous but careful hands of their physicians. This color also encourages the patient to put trust in whatever medical procedure will be carried out on him/her.

In contrast, green is used also in hospitals despite its shade. In psychology, green symbolizes tranquility and focus, qualities that surgeons need while performing surgeries or operations. It started in 1914 in a San Francisco hospital when "spinach green" was introduced in operating rooms and found out that this color creates a complementing effect to blood (i.e., hemoglobin red), unlike in white background. Because of this color effect, it becomes easier to





## Perks of a colored pill

Every medicine pill for medication has unique appearance and taste, and essentially has specific function. Nevertheless, not every pill is appreciated and consumed by most patients simply because ordinary medicines are not physically enticing (i.e., a plain white pill).

In psychology, the presence of colors plays a critical role on how patients consume, identify, and differentiate one pill from another through its unique color and shape configuration. This scenario commonly happens to patients, like elderly people and the immunocompromised, who are undergoing multi-drug treatment.

For instance, children having cough are engaged to take pink cough syrup since pink has an impression of a sweet taste and fruity smell. Green pills are commonly demonstrated by anti-nausea drugs since green shows tranquility, while blue pills are common to anti-flu drugs which can be associated to sleep or rest. Other colored medicines, like

the red ones may signify strong side effects; yellow ones for phlegmatic-related cases; and purple ones for anti-oxidant concerns. In addition, the specific type of medicine for asthma can be determined through the color of inhaler.

The classification of medicines enables the consumer, as well as the pharmaceutical companies, to create branding of specific generic drug for a particular disease. Furthermore, color designation facilitates less medical errors in identifying medications or doses especially to patients who have difficulty in classifying two different drugs.

Just like in science, colors and medicine create a harmonious relationship when it comes to elevating the quality of life. Through the years, innovative concepts in the field of medicine prove to show that art and science can go well together. Regardless, this kind of relationship does not stop with this. It goes beyond to what mankind can benefit from this innovation because every person has unique healthcare needs.

## Color Coding System

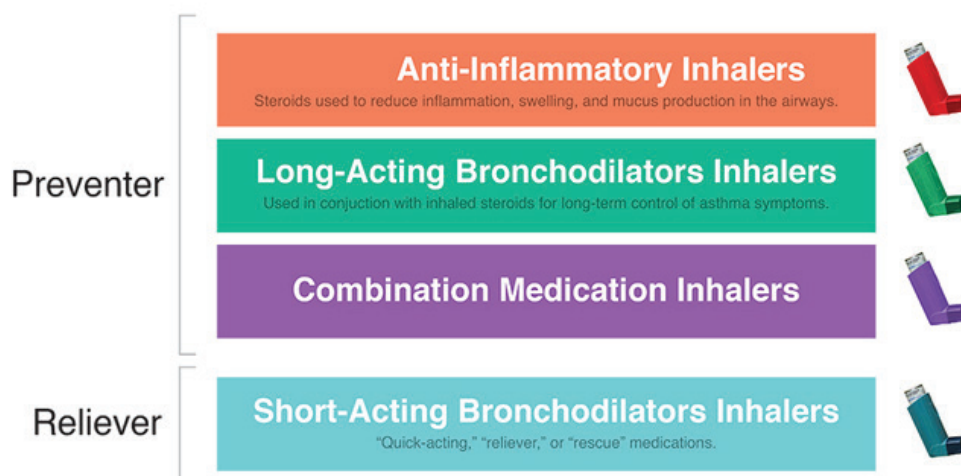


Photo from <http://www.osmancueto.com/breatheinhaler/>





Photo from [tours.asialighttravel.com](http://tours.asialighttravel.com)

# Sorsogon's List: Scientists find unique reptiles and amphibians in Bulusan Lake

by David Matthew C. Gopilan, DOST-STII

*“The presence or absence of certain amphibian and reptile species within a place will tell us about the ecological condition of the area.”*

— Jake Wilson Binaday

A serene, quiet tourist destination such as Bulusan Lake is not only a haven for vacation but also a solace for reptiles and amphibians.

A paper recently published in the Philippine Journal of Science presented the first inventory of reptiles and amphibians in Bulusan Lake in Sorsogon province. The researchers said there are still many more species to be added in the initial inventory.

“A preliminary survey only covers a small area of a target region and is only done for a limited time. Therefore, not all microhabitats in the area can be surveyed,” lead author Jake Wilson Binaday revealed while explaining that their study is preliminary and not comprehensive.

“Thus, there are still many species that were not encountered though they are highly likely to occur within the area,” Binaday continued.

Their paper titled “Amphibians and Reptiles in the Vicinity of Bulusan Lake, Bulusan Volcano Natural Park, Sorsogon, Philippines” claimed that most explorations and discoveries on herpetofauna—the collective term for reptiles and amphibians—in the Bicol Region were all done in northern and central parts, leaving the southernmost tip of Luzon Island waiting for discovery.

Binaday and his co-authors Ace Kevin Amarga, Ernest Barrameda Jr., and Bobet Jan Bonagua said that they took photos of the creatures they encountered. They were not allowed to take voucher specimens since the area is an environmentally protected area. The authors then submitted their photos to the digital archive of Lee Kong Chian Natural History Museum at the National University of Singapore for permanent storage.



## Vipers, dragons, and bloodsuckers

Among the species the authors reported are the Philippine pit viper, the Luzon forest dragon, and the marbled bloodsucker. These species are among the 26 species the authors reported in their paper.

“The presence or absence of certain amphibian and reptile species within a place will tell us about the ecological condition of the area. Most amphibians and reptiles have very specific habitat requirements and are highly sensitive to disturbances,” Binaday said.



**Luzon forest frog (*Platymantis luzonensis*).** Its name indicates that this species can be found only in Luzon Island in the Philippines. Notable in this frog is the white iris above its pupil.



**Luzon Forest Dragon (*Gonocephalus cf. sophiae*).** Known to be secretive, this dragon camouflages itself on vines and branches. Bulusan Lake is also a home for reptiles like the Philippine false gecko, Enteng’s monitor lizard, spiny waterside skink, and blunthead slug-eating snake. There are also amphibians like the Luzon forest frog, the common forest frog, and Woodworth’s frog.



**Philippine Pit Viper (*Trimeresurus flavomaculatus*).** Binaday said that after seeing this snake for the first time in his Biodiversity for Beginners short course at the University of the Philippines Los Baños, he confirmed to himself that studying herpetology would be his passion.



**Asian Vine Snake (*Ahaetulla prasina preocularis*).** This vine snake comes in various color variations; its green variant was found in a branch.



**Enteng’s monitor lizard (*Varanus dalubhasa*).** The lizard was seen scavenging on discarded food waste in a kitchen of a lounge near the Bulusan Lake.





*Binaday handling the snake *Aplopeltura boa*. Scientists thought that the Blunthead Slug-eating Snake thrives only in Mindanao, Bohol, Samar, and Palawan until Binaday marked its first sighting record in the island of Luzon.*

### Old land bridges?

Binaday emphasized that Sorsogon may possibly have been a place for genetic exchange between species from Luzon and Eastern Visayas during the past 10,000 years.

He believes that land bridges that once connected the major islands in the Philippines – scientifically called as Pleistocene Aggregate Island Complexes (PAIC) – made this happen. “This is supported by the fact that recent studies showed that there was an existing land connectivity between Samar and Sorsogon during the Pleistocene,” Binaday explained.

“Most species that we have encountered can be found throughout the Luzon, Mindanao, and Western Visayas PAICs. A few are Luzon PAIC endemics, some are Luzon and Mindanao PAIC endemics, while others can be found throughout most of the country’s major islands,” Binaday stated.

Some species that may have travelled in various parts of the country through land bridges are the Jagor’s common ground skink, the northern temple pit viper, and the common tree frog.

### Drumming for more research, conservation

According to Binaday, the Philippines is rich with herpetological diversity. “New species are being discovered but information such as natural history data on their ecology and life history is lacking.”

The paper suggests that herpetofauna in Southern Luzon in general faces natural and manmade threats like climate change, natural disasters, and wildlife trade. As an example, Binaday took the case of the Luzon forest frog which thrives in thick forest vegetation for food and mating, and usually hides in damp tree holes.

“If these thickly forested areas are being slowly converted into agricultural and residential lands, this species will likely suffer from population decline (since) lesser forest cover will easily expose them to their natural predators.”

Binaday and his fellow researchers working in the Bicol region aim to produce a complete list of all amphibians and reptiles of the Bicol region including ecology, genetic details, and conservation status.

*The full article of “Amphibians and Reptiles in the Vicinity of Bulusan Lake, Bulusan Volcano Natural Park, Sorsogon, Philippines” can be downloaded for free in the PJS Volume 146 No. 3 at [philjournalsci.dost.gov.ph](http://philjournalsci.dost.gov.ph). The photos were generously provided by Jake Wilson Binaday.*



# Teenage pregnancy during disasters

by Joselito A. Carteciano, *DOST-NRCP*



**A**dolescents displaced from their homes due to disasters should be given safe and private spaces in order to avoid pregnancy or sexual molestation, a social science researcher from the Department of Science and Technology-National Research Council of the Philippines (DOST-NRCP) recommended.

The recommendation came at the heels of her study that found that teenage girls in relocation sites following natural disasters are more likely to get pregnant or sexually molested.

The research, conducted by Dr. Gloria Luz M. Nelson, found out that teenage girls aged 10-19 years old are most vulnerable during the time of stay in evacuation and relocation centers. Nelson cited poor condition and minimal provision for privacy and security as factors for such vulnerability.

Results of the study revealed that two out of 10 teenage girls in Eastern Visayas got pregnant regardless of the severity of the typhoon that displaced them from their homes. Nelson said that after super typhoon Yolanda in 2013, from the total population of teenage girls in the region, 23.5 percent got pregnant, 29.9 percent had premarital sex, and 14.8 percent got pregnant and had another child the following year.

The study, funded by the Population Commission, also reveals that the number of pregnant girls likewise increased after typhoon Ruby hit the region in 2014. Some 23.6 percent of teenage girls got pregnant, 32.3 percent had premarital sex, and 21.6 percent got pregnant and had another child the following year.

The search also shows that relocation or displacement impacts the personality and behavior of teenage girls. Nelson explained that the number of moves from one shelter to another could trigger a prolonged return of teenage girls to their "normal life."

Nelson also cited other teenage girl characteristics which could be associated with pregnancy: social characteristics such as age of menarche, socioeconomic status, and educational attainment;

non-sexual risky factors such as drinking of alcoholic beverages, exposure to pornographic materials, and suicide attempts; and sexual risky behaviors such as premarital sexual experience, sexual initiation between ages 15-19, having a boyfriend, and/or having more than three boyfriends at these ages.

Among the recommendations of this research is the inclusion in House Bill 474 (Prevention of Adolescent Pregnancy) some provisions that will address both the sexual and non-sexual risk factors that increase the incidence of teenage pregnancy in times of disasters.

Aside from the provision of safe and private spaces, Nelson also recommended that shelter-relief efforts during and after disaster should be subjected to the Harmonized Gender and Development Guidelines to ensure its gender-responsiveness.

She also urged the speeding up of construction of permanent shelters to hasten the displaced youth's return to normal life after disaster. Likewise, she underscored the importance of institutionalization of public-private partnership to improve access to adolescent sexual and reproductive health information and services.

Moreover, she pushed for the regulation in the access of adolescents to explicit pornographic materials and continuing of alternative education that is gender-sensitive on sex and reproductive health care.

Dr. Marieta Bañez Sumagaysay, DOST-NRCP executive director and a social science researcher herself, seconded Nelson's recommendation.

The research results along with other policy recommendations were presented in the DOST-NRCP Visayas Policy Forum. Dr. Christina A. Binag, DOST-NRCP president, stressed the importance of the activity as a way of bringing to stakeholders the crucial role of scientific and empirical evidence in policymaking and program implementation.





# oneSTore

## Pushing limits, defying distance

by Jamille B. Palpallatoc, DOST-II



While most MSMEs are new to the concept of e-commerce, most businesses in the Philippines still operate in the traditional way, which limits their market. A lot of Filipino products of high quality are innovative. At present, their market is only confined in their vicinity. It is for this reason that the Department of Science and Technology developed oneSTore—to make the products and services of DOST-assisted firms become more accessible and cost-effective and have more chances to develop a global customer base.

The oneSTore.ph is an electronic commerce (e-commerce) platform initiated by former DOST Secretary Mario G. Montejo and is continuously being supported by the current DOST Secretary Fortunato T. de la Peña. It is a medium for DOST-supported MSMEs to engage in e-commerce for trading products and/or services using information and communications technology (ICT).

Initially, oneSTore started with 10 local products when it was launched in 2015. After the website went through intensive database, server-side and client-side script optimization to accommodate a larger number of products, it has on record over 10,000 Filipino products available which are manufactured in different regions in the country. With the assistance of valuable third party partners, these products have reached different local areas.

### Defying distance

A classic example is the story of Memerissa España, who is a small-time entrepreneur in the remote village of Suklayin in Baler, Aurora. Being confined in a small village miles away from cities, Mene Crafts and Things only relied on customers from Baler and nearby towns. Motivated to expand her business, España sought the assistance of DOST through the Small Enterprise Technology Upgrading Program (SETUP) and oneSTore. The latter has provided the opportunity for Mene Crafts and Things to reach people beyond its vicinity.

Just recently, a customer in Paris, France visited the oneSTore site and placed an order on the fans manufactured by Mene Crafts and Things. He wanted to use these fans as souvenirs for the Philippine Independence Day Reception organized by the Philippine Embassy in Paris on 15 June 2017 at the Musée de la Marine. Even though oneSTore does not carry out international transactions yet, DOST wanted to make it possible for España. So the team coordinated with the customer in Paris and Mene, presented several options, and agreed to a common process. The efforts made by all parties paid off in the end when Mene's fans reached the City of Lights.

When Mene's fans reached the Parisian streets, the sense of pride and fulfillment was overflowing. Seeing a humble Filipino product against the iconic Eiffel Tower backdrop is beyond inspiring. This is the reason that, despite being a newbie in e-commerce, the DOST will continue creating opportunities and supporting local entrepreneurs because, like them, DOST believes that battles can be won against greater odds.



# MAY PASOK BA?

**DOST-PAGASA scientists identify climate factors that affect new academic calendar**

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

*What are the effects of climate to classes in the new school calendar?*

*Weather scientists checked climatic variables and used simple statistics and found important things that need to be looked into.*

**F**our years have passed since the academic calendar (AC) shift was implemented in a number of universities in the Philippines. Last 2014, the top four universities of the Philippines (University of the Philippines, Ateneo de Manila University, De La Salle University, and University of Santo Tomas) began shifting to the August-May two-semester terms from the June-April norm. Other universities followed suit.

Since holding school classes are largely affected by prevailing weather and climatic conditions, researchers Dr. Flaviana D. Hilario, Dr. Marcelino Q. Villafuerte II, and Edna L. Juanillo of the Department of Science and Technology-Philippine Atmospheric, Geophysical and Astronomical Services Administration (DOST-PAGASA) looked into the impact of the Philippine climate in AC shift. Their study entitled, "Climatic Insights on the Academic Calendar Shift in the Philippines" was published in the September 2017 issue of the Philippine Journal of Science, the oldest scientific journal publication in the Philippines. "In this study, the methods that we employed are quite simple; we just made use of the observed climatic variables and applied simple statistics, but we analyzed them carefully," said Dr. Marcelino Q. Villafuerte II, DOST-PAGASA weather specialist.

Villafuerte gave high importance to the rigorous peer-review process that their study has gone through "because it strengthened our initial interpretations and made our findings more accessible to the general public." It is a common practice in journal publications that papers undergo peer-review evaluation prior to dissemination to ensure accuracy and novelty of all papers.

In the paper, the authors examined the data of PAGASA about rainy season, extreme rainfall and temperature events, and occurrence of tropical cyclones (TC) from 1971-2013 to compare the old and new ACs in terms of climate.

The data were recorded by 43 meteorological stations scattered in the whole country. While there is a 10-km separation between some stations, the authors note that the stations are not enough to give the complete picture of the Philippine climate due to its intricate land and seascapes.

"We know that based on our climate type, the timing of rainy season might differ from one place to another, but that needs to be translated directly into its implications on the academic calendar shift in a particular region of our country," Villafuerte added.



*Photo by Henry A. de Leon, DOST-STII*



## Rainy graduation?

According to the paper, the western parts of Luzon like the Metro Manila, provinces of Mindoro, Negros, and Palawan – those with Type 1 rainy season (rainy season hitting from mid-May to mid-October) – can experience 60 less school days coinciding with the rainy season. Areas like western parts of northern Mindanao, eastern section of Palawan, Isabela, and Cagayan which have Type 3 rainy season also have the same case. The paper has no recommendation on other provinces.

The paper added that TC-related class suspensions are reduced in the new AC since cyclones usually happen during the months that compose the old AC.

However, graduation ceremonies, the most awaited moments of students and parents alike under the new AC, can be met with rainfalls. This situation can be applied in large parts of Luzon. The last day of classes in the new AC falls in June – the time when the rainy season usually starts.

The paper also pointed out that hot temperatures are recorded from March to May. These are the months where classrooms are empty in the old AC setup but filled with students in the new AC. The authors added in the paper that “[s]uch findings imply an uncomfortably hot environment, which poses health risks and could affect school-related activities.”

“We are hoping that the schools will consider the points that we stressed in our study. Specifically, we are looking forward that they will consider environment-friendly solutions concerning the possible effects of extremely hot temperature occurring in regular school days,” said Villafuerte.

Villafuerte also discussed that the warming of the global mean temperature which has been observed by scientists around the globe may have impacts in the local climate. “As mentioned in the study, we have already been detecting changes in our local climate, particularly on extreme events. However, projections of climate condition in the country, several decades from now, is highly uncertain,” he cited. Thus he recommends further studies on climate and its effect.

## Considering agricultural cycles

The new AC encountered many responses. School heads from the top four Philippine universities shared the same sentiment that an AC synchronized with other Southeast Asian countries would improve research collaborations as well as student and faculty exchange programs which will improve competitiveness and international linkages.

“While our findings suggest that shifting our academic calendar might be beneficial, other factors that need to be considered are, for instance, its socio-economic implications,” Villafuerte mentioned.

A memo previously released by the Commission on Higher Education stated that families from farming and fishing communities would have difficulty shelling out finances in an August school opening since they have already spent their financial resources in prior months.

On the opening of classes in August, Villafuerte pointed out, “We believe that this could also open an opportunity for students to help their parents in farming activities as their school vacation could fall around June and July. This means additional income that could be saved by the family to prepare for the opening of classes in August.” He still argued that this concern needs further investigation.

Villafuerte and his colleagues hope that their paper could be used to support the bill recommending that school openings will fall between the second Monday of August and second Monday of September. Senator Francis C. Escudero, chair of senate committee on education, sponsors the bill.







## DOST's Malnutrition Reduction Program bags Projects that Work prime award

by Julieta B. Dorado, DOST-FNRI

Out of 27 projects worldwide, the Department of Science and Technology-Food and Nutrition Research Institute's (DOST-FNRI) Malnutrition Reduction Program or MRP in 2017 bagged the top award in a competition called Projects that Work. This competition is sponsored by US-based FAIMER or the Foundation for Advancement of International Medical Education and Research which recognizes projects that succeeded beyond initial implementation and have had a significant positive impact on health or the community for over three or more years.

The story of MRP was shared in an oral and poster presentation during the 2017 Network: Towards Unity for Health World Summit on Social Accountability held in Hammamet, Tunisia on 8-12 April 2017 along with projects from South Africa, Uruguay, Uganda, India, and Cameroon.

"Indeed, it is truly inspiring and humbling for the DOST's banner program to be recognized internationally," says Dr. Mario V. Capanzana, DOST-FNRI director.

The MRP is a strategy which supports the current concern for stunting as elaborated in the Sustainable Development Goals and in improving the lives of our young Filipino children in the countryside. As reported in the 2015 FNRI updating survey, two in every 10 children, age 0-5, are underweight and three out of 10 are stunted or underheight-for-age.

**2015 FNRI updating survey, two in every 10 children, age 0-5, are underweight**



**and three out of 10 are stunted or underheight-for-age.**



Source: DOST-FNRI



## Package of Intervention

The DOST-FNRI initiated in 2012 a package of intervention for young children and their mothers. The goal was to empower the marginalized as a strategy to address child malnutrition and encourage local government units (LGUs) to adopt the intervention and for entrepreneurs to localize the production of complementary foods. The idea was to conduct a research while implementing a social program that will help these young children in the countryside.

The field testing which consisted of complementary feeding for young children and nutrition education of mothers/caregivers yielded positive results. The prevalence of underweight children aged six months to below three years old was reduced, and the mothers' and caregivers' knowledge on nutrition significantly improved.

Moving on to 2013–2015, the MRP was rolled out to the regions in terms of orientation, advocacy, and capacity building of local community workers, and provision of complementary processing equipment to LGUs with high prevalence of malnutrition.

## Accomplishments

The MRP's implementation from 2015 to the present is continuously supported by the DOST through the complementary food processing equipment provided to the LGUs which, in turn, provide the human resources to operate the facility.

As of 2017, the program had 29 operational production facilities classified as small, medium, and large scale in the regions. The program's nutrition intervention covered 36 provinces and 99 cities and municipalities and trained 4,118 community workers while its complementary feeding intervention had 10,842 children participants. To ensure sustainability, 17 local resolutions have been approved and passed for the adoption of the MRP in their respective LGUs.



## Sustaining MRP

Preliminary monitoring showed that communities that were able to sustain the program have supportive local government officials who consider nutrition as a priority agenda. Community workers were also trained to implement the intervention.

The MRP opens up many opportunities for partnerships and cooperation for the common goal of uplifting the lives of young Filipino children.

Aside from the Projects that Work award, the MRP was also awarded as one of the programs in the National Economic Development Authority's National Priority Plan (NPP) for 2015, 2016, and 2017. Inclusion in the NPP entitles donations made under the program to be fully tax deductible as stipulated in Section 34 (H) (2) (a) of the Philippine National Revenue Code.

The key factors in the continuous implementation of MRP in the regions up to the present include the DOST's solid commitment and resource allocation, as well as the LGUs' strong support and participation in the program.

*(Authors of the research paper are JB Dorado, MV Capanzana, Ph.D., CR Magsadia, RV Viajar, GP Azana, EO Rongavilla, GS Caraig, MT Bugas, Ph.D., DG Domiquel, and HA Ibarra, all of DOST-FNRI)*







## Gina eyes DOST's CEST program to help alleviate poverty

by Laurence M. San Pedro, *DOST-STII*

Photos by Gerardo G. Palad, *DOST-STII*

“We can get our country out of poverty and I need the help of the Department of Science and Technology (DOST),” so said Regina Paz L. “Gina” Lopez, famous environmentalist and philanthropist during the National Science and Technology Week celebration way back in 2015.

She was looking at DOST’s program called CEST, or the Community Empowerment through Science and Technology, as the “help” she needs to aid the country in getting out of poverty.

CEST is a program of the DOST which aims to alleviate poverty through S&T interventions in health and nutrition, water and sanitation, basic education and literacy, livelihood and enterprise development, and disaster risk reduction and management.

### Breaking new ground through ‘The Quest’

Known for being a pioneer in corporate social responsibility, Lopez has taken her advocacy to the next level. Her foundation called “ILOVE” or Investments in Loving Organizations for Village Economies launched “Quest for LOVE,” a nationwide search for loving organizations seeking to transform marginalized communities into agro-forestry, fisheries, or eco-tourism sites.

Recently, ILOVE reached out to several government agencies to give a hand. Because of its CEST program, the DOST naturally became one of the ILOVE’s partners.

Other partner government agencies include the Department of Trade and Industry, Department of Social Welfare and Development, Department of Tourism, Department of National Defense, Department of Public Works and Highways, Technical Education and

Skills Development Authority, the Social Economy Action Research Foundation, Bayan Academy for Social Entrepreneurship and Human Resource Development, and the private sector. The ILOVE-government partnership was able to raise P5 million.

Because of its noble intent, ILOVE caught the heart of DOST Secretary Fortunato T. de la Peña.

“I would like to express my admiration to the Quest for LOVE. This is very relevant, timely, and innovative. We have a program that matches ILOVE very well and we call it CEST,” said the Secretary during the launch.

To date, the CEST program has already benefited many grassroots communities around the country. One example is Barangay Apang in Alilem, Ilocos Sur which was dubbed as the “poorest of the poor” in most surveys. Farmers and fisherfolks are now able to find alternative income by selling fruits and vegetables in nearby markets and stores to be able to buy other goods for their families.

Unlike the usual reality TV competitions that showcase talents such as singing and dancing, the Quest for LOVE wants to put the spotlight on loving organizations that are passionate and goal-driven.

“The stand of ILOVE is to bring genuine economic growth through area development,” Lopez said.

“Why do we just give awards to those who sing well? Why don’t we give awards to communities that have the guts and creativity to help themselves get out of poverty?” she added.

The competition will feature the journey of the transforming poor communities into social and economic enterprises in a reality TV show that Lopez will produce.





### Area development

The “Lola Sayong Eco Surf Camp” is one of the ongoing projects of the ILOVE foundation and can be found in Gubat, Sorsogon. It was initiated by a kind old lady who decided to transform her property into a beachfront paradise where local street kids were provided food, shelter and jobs by giving surfing lessons to tourists.

“They have a really beautiful surf but the people there were really poor. So when I went there, I got money from Energy Development Corporation and this is how we use it: we put surfboards, boat refurbishing, beach tents, multi-purpose hall, toilet and shower facilities, and glass bottom floating cottages. It is area development,” Lopez said.

From being a poor community, Gubat has grown to be a role model for area development.

According to her, they invested P1.5 million for area development in Gubat. After a year, their gross revenue already increased to P5.9 million.

“Because of the investment of P1.5 million, agriculture and fisheries came up. The cost of transportation was affected because a lot of people are going there. Also, other ecotourism sites sprang up in nearby towns like Sorsogon City, Bulusan, and Matnog,” she added.

The project also provided new services as the town now has massage therapists and tourist guides as well as emerging developments in other micro enterprises such as T-shirt printing, souvenirs, handicrafts, and food production.

### The quest for the change agent

“One thing that I want to say from my experience is that: the key is the change agent. You can have a lot of money, scientists, or government assistance, but if you do not have a change agent, it is not going to work,” Lopez remarked.

She added, “The spirit of the Quest is to search for loving organizations that have the LOVE idea: a great, splendid idea on how to lift up village economies.”

The Quest is open to social enterprises, cooperatives, people’s associations, foundations, NGOs, and other socially-oriented organizations. They must have an ongoing intervention program for a specific community and/or have completed at least two successful community development programs in the past.

Application period was from 8 March to 13 April 2018.

Sixteen organizations were pitched in the initial screening to be trimmed down to the top eight deserving loving organizations that shall receive P100,000 plus direct access to government support.

The Quest for LOVE will run for eight months and will be aired as a segment in Gina Lopez’s TV program “G-Diaries”. At the end of the period, the top three loving organizations will be awarded based on tangible enterprise and the social and environmental outcomes they achieved. The winners shall receive additional direct assistance from ILOVE and its private and government partners.



# From homemakers to dollar earners: How Salay artisans handcraft success

by Hyacinth J. Tagupa, DOST-X



**A**long the highway of the quaint barangay of Poblacion, Salay is an unassuming glass storefront whose door sign says “SHAPII: Made in the Philippines.” The shop is a small square room, its walls lined floor-to-ceiling with greeting cards, picture frames, and purses of various shapes and sizes.

To a passerby, the shop looks like a regular *pasalubong* store selling trinkets and novelties. In truth, this little square space is only the showcase area of the Salay Handmade Products Industries, Inc. (SHAPII), one of the leading exporters of handicrafts in Region 10.

Behind the store, tucked a little away from the roadside, is SHAPII’s administrative and production compound. In this compound – where one finds working tables, large paper sheets, and machines from the Department of Science and Technology (DOST) – is where the magic happens.

## Raking in dollars

Evident in its small storefront, SHAPII does not spend so much on advertising. And it doesn’t really have to—its loyal customer bases are in Japan, United Kingdom, and several other European countries. This is why despite the modest façade, the workers at the enterprise are literally earning dollars.

SHAPII’s handmade paper products are highly valued among the Japanese whose lingering traditions include papercraft. Among SHAPII’s

very first customer was a Japanese organization dedicated to this craft – this organization began patronizing the Filipino enterprise in the 1990s and is still one of its loyal clients today.

During its first few years, SHAPII was simply a community-based project, initiated in 1987 by the ardent community organizer Loreta Capistrano-Rafisura and composed of Salayanons who were unemployed. Mrs. Rafisura recalls how she initially set out to establish a foundation but had to incorporate the firm for the sake of the members’ income.

Like its products, the business venture was small and slowly built by hand, but it was this personal touch that made the public – especially foreigners – notice it. Soon, SHAPII became a favorite at product expos and the Rafisuras took advantage of this by creating linkages left and right. One of those linkages, fortunately, was with the DOST.

## Traditional craft, high-tech tools

The SHAPII production compound bursts with color, texture, and activity. First to greet you is the product development area, where local artisans handcraft product prototypes like elves in a magical workshop. From dainty cards to hanging ornaments to sturdy “leatherized” boxes, this is where the production begins.

In another corner, a couple of women are bent over a table, carefully gluing pressed flowers to sheets of paper using a pair of

*Salay Handmade*  
Touching emotions. Bridging lives.



tweezers. Though this craft has become their source of income, their loving meticulousness and the steady gentleness of their hands keep the task from being mechanical and mundane.

The facility also has a sewing area, and here you start finding the equipment that SHAPII has acquired through the DOST. The high-speed sewing machines are efficient for the firm's "leather paper," a tougher, more pliable version of paper that SHAPII has developed for products such as wallets and bags.

Further into the compound are more of these tools, but bigger and more complex, such as the laser printer and the straight cutter, both specialized to suit SHAPII's handmade paper materials which are mostly made of abaca and cogon grass fibers.

This mix of traditional paper-crafting and modern machinery allows SHAPII to keep thriving despite the decline in the paper industry. While its marketing team is hard at work seeking more market opportunities, the firm's production has become better and more refined, though still true to the essence of the craft.

"I'm really thankful to the DOST," Mrs. Rafisura says, explaining that the agency's technology interventions have helped the enterprise improve its processes and products, ultimately leading to an increased number of happy clients.



### Enterprise growth through technology

Like SHAPII, hundreds of small- and medium-scale businesses have benefited from the technological assistance provided by the DOST Regional Office 10 (DOST-X). The assistance comes from a DOST initiative called the Small Enterprise Technology Upgrading Program (SETUP) which uses technology to help enterprises improve their productivity and marketability. Depending on what the entrepreneur needs, this technology could be in the form of equipment, technical consultation and training, and even product packaging.

SHAPII first applied for SETUP assistance in 2013, and promptly received its requested machines. These machines, which the firm is still using now, have been key to making their production faster and more efficient while enhancing the quality of their products.



### SHAPII crafting the future

Over the years, and with the help of agencies like the DOST, SHAPII has grown beyond a small income-generating project. Today, it is the livelihood of many families in Salay. It also runs the SHAPII Foundation which has so far supported over a hundred high school and college scholars in finishing their studies. All the while, the business continues to operate responsibly with fair trade and environment-friendly practices.

SHAPII intends to keep molding the future of its community through socially-conscious ways. It may be a successful dollar-earning business, but for the Salayanons who make up this enterprise, their craft is more about the honest work of their hands – and the DOST helps them craft more with it.



*Salay Handmade*  
Touching emotions. Bridging lives.



## DOST-NRCP elects 29th President

**THE NRCP** announces the appointment of the newly elected President of the DOST-National Research Council of the Philippines (DOST-NCRP)'s Governing Board Dr. Ramon A. Razal and the Executive Committee Officers.

Dr. Ramon A. Razal is Professor 12 in the Department of Forest Products and Paper Science of the University of the Philippines Los Baños College of Forestry and Natural Resources. He teaches Wood Chemistry, Non-Timber Forest Products, and many other courses. He was also recently named UP Scientist 2 for 2015-2017.

When announced of his selection, he said, "I was in a state of shock when it was over, so I could only mutter when asked to speak immediately after being elected, 'Taga-bundok po ako.'" Such background gave him the burden of scientists of being able to help improve the lives of ordinary Filipinos such as ambulant vendors. Further, he underscores that his clarion call as DOST-NRCP President is "for every Filipino to be awed by the many possibilities that science and the arts can bring."

Dr. Razal admits some incongruence between evaluating basic research proposals with what motivates basic research and what it intends, or rather not intend, to accomplish. Curiosity, he said,



is the driver of basic research. Thus, inappropriate questions thrown to researchers while defending their proposals stifle the motivations toward basic research. To address this, Dr. Razal intends to call for a review and possible overhaul of the proposal review process to kindle more basic research. He also commits to promote the National Integrated Basic Research Agenda as DOST-NRCP's roadmap.

Dr. Razal is also the chairperson of Division VI Agriculture and Forestry for two consecutive terms and member of DOST-NRCP since 14 December 1990. To know more about the new President, visit his profile at <http://www.nrcp.dost.gov.ph/governing-board?id=161>

[dost.gov.ph/governing-board?id=161](http://www.nrcp.dost.gov.ph/governing-board?id=161)

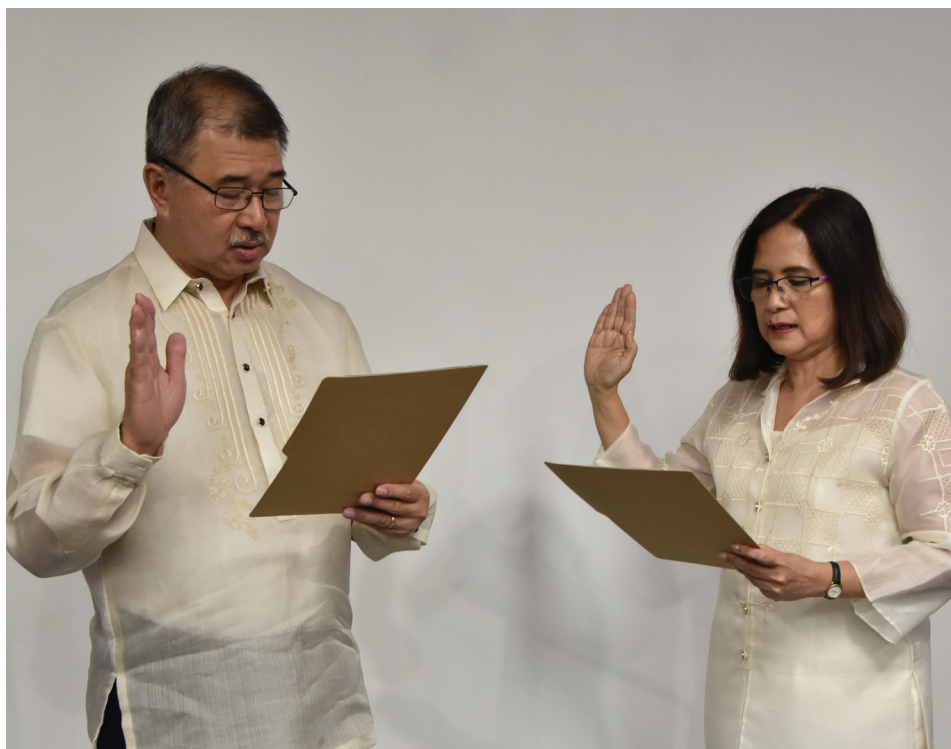
Completing the CY 2018-2019 Executive Committee Officers are: Dr. Arnel A. Salvador, vice president; Dr. Ma. Natalia R. Dimaano, corporate secretary; Dr. Polly W. Sy, treasurer; Dr. Maricar S. Prudente, assistant corporate secretary; Dr. Edanjarlo J. Marquez, assistant treasurer.

Meanwhile, the newly elected Governing Board (GB) members during the 85th General Membership Assembly are Dr. Gilberto M. Llanto and Dr. Clarita Carlos, members-at-large; Dr. Jovencio G. Apostol, Division IV Pharmaceutical Sciences; Dr. Gregorio E.H. del Pilar, Division VIII Social Sciences; Dr. Mafel C. Ysrael, Division X Chemical Sciences. Likewise, re-elected GB members are Dr. Maricar S. Prudente, Division I Governmental, Educational, and International Policies; Dr. Raul V. Destura, Division III Medical Sciences; Dr. Ramon A. Razal, Division VI Agriculture and Forestry; and Dr. Ma. Natalia R. Dimaano, Division VII Engineering and Industrial Research.

The GB officers' term is one year covering the period 1 April 2018-31 March 2019. The DOST-NRCP consists of 13 Scientific Divisions which support and promote basic researches.

## New DOST-ITDI deputy director

**DEPARTMENT OF** Science and Technology (DOST) Secretary Fortunato T. de la Peña (left) administers the oath of office to Dr. Diana Lacambra-Ignacio as the new deputy director for administrative and technical services of the DOST-Industrial Technology Development Institute (ITDI). Prior to her appointment as deputy director, Dr. Ignacio was the chief administrative officer at the DOST-ITDI in charge of property and procurement management, cashier management, human resource management, and records management sections. DOST-ITDI is the institute that provides several services like tests and analyses, food engineering, metrology, process engineering, packaging research, clean production, and others. For other information on DOST-ITDI and its services, contact telephone numbers (02) 837-2071 to 82. *(Photo by Gerardo G. Palad/Text by Rodolfo P. de Guzman, S&T Media Service)*





# STARBOOKS units deployed in four identified provinces

by David Matthew C. Gopilan, Allan Mauro Marfal, and Jasmin Joyce P. Sevilla *DOST-STII*



*Alan C. Taule, chief of the Information Resources and Analysis Division of DOST-STII shares the significance of STARBOOKS to communities in remote areas that have no access to internet connection. Photo by Allan Mauro V. Marfal, DOST-STII*

**F**our provinces recently received their respective STARBOOKS units which could uplift the quality of education of their public schools and help them in nurturing their future scientists, engineers, and innovators.

The Department of Science and Technology-Science and Technology Information Institute (DOST-STII), in partnership with United Nations World Food Programme (UNWFP), deployed STARBOOKS units in Benguet, Maguindanao, Misamis Oriental, and Davao Oriental to give students and teachers in different public schools tons of learning resources on science, technology, engineering, and mathematics (STEM).

This is the result of the Memorandum of Agreement inked by DOST-STII and UNWFP on 12 August 2017 in which latter committed to provide 112 STARBOOKS-enabled computers to nine provinces in the country.

Short for Science & Technology Academic and Research-Based Openly Operated Kiosks, STARBOOKS is a digital science and technology (S&T) library developed by DOST-STII to equip different public schools with valuable learning resources on S&T.

The first leg of deployment was held on 27 February 2018 at the Provincial Capitol

of La Trinidad, Benguet in which 14 Local Government Units (LGUs) and public schools received STARBOOKS units. Recipients were: Bokod National High School-Daclan Annex, Bokod National High School, Tublay School of Home Industries-Bokod Extension, Ambuclao Annex, Adaoay National High School-Abucott Extension, Kapangan Central National High School, Municipal Government of Sablan, Adaoay National High School, Kabayan Central Elementary School, Local Government Unit of Kabayan, Kapangan National High School, Gov. Bado Dangwa Agro-Industrial School Extension, Local Government Unit of Kapangan, Sablan National High School-Balluay Extension, and Local Government Unit of Bokod.

"We hope that this digital library would stimulate interest of students on science and later on love the STEM track and the whole region hopes for more digital libraries deployed in their schools," said Assistant Regional Director Bettina D. Aquino of the Department of Education-Cordillera Administrative Office (DepEd-CAR).

In the next deployment, conducted on 01 March 2018 at the Cotabato City Government Center, STARBOOKS were units handed over to four LGUs and 11 public schools in the province of Maguindanao.

Recipient municipalities in Maguindanao were Kabuntulan Mother, Buldon, South Upi, and Northern Kabuntulan. Meanwhile, the 11 public schools with newly-installed STARBOOKS were Kabuntulan National High School, Gallego Edgcor National High School, Dinganan Buldon National High School, Karim National High School, South Upi National High School, Pilar Integrated Technical Vocational High School, Looy Integrated Technical Vocational High School, Pandan National High School, Lumao National High School, Gayonga National High School, and Datu Alamanza Dilangalen National High School.

Later, on 05 March 2018, nine STARBOOKS units in Misamis Oriental were deployed to nine public schools in the province. Recipients were: Mantangake National High School, Binuangan National High School, Binuangan Central School, Libertad National High School - Misamis Oriental, Manticao National High School, Cabalantian National High School, Medina National Comprehensive High School, Portulin National High School, and Don Gregorio Pelaez National High School.

DOST-X Director Alfonso P. Alamban emphasized the need to embrace innovation especially in promoting basic education. "We need to cope with the latest technologies and innovation



## STARBOOKS

given that our students belong to the bracket of Millennials and Generation Z. Innovations such as this [STARBOOKS] is the driver of development,” he added.

In addition to thousands of credible and valuable science information in STARBOOKS is one key content called the Reference for Emergency and Disaster (RED) Book by DOST’s Project NOAH (Nationwide Operational Assessment of Hazards). According to DOST-STII Information Resources and Analysis Division Chief Alan C. Taule, the RED Book is a disaster awareness resource material, which is a vital tool to help LGUs prepare before, during, and after various hazards caused by natural calamities.

Further, UNWFP Senior National Programme Officer Juan Blenn Huelgas pointed out the importance of the RED Book reference material that is included in each STARBOOKS unit. “It is stated in RA 10121 that a disaster risk reduction management system should be incorporated in schools, and STARBOOKS is a good intervention in addressing that,” he said. Huelgas also added that for this year, they are targeting to deploy hardware units for STARBOOKS in 56 municipalities within 10 provinces across the country.

Autonomous Region for Muslim Mindanao Governor Mujiv Hataman said in a statement that a digital learning resource material such as STARBOOKS could improve the way our public schools nurture students in Maguindanao.

“With tons of information provided by this library in a box, particularly in the fields of Science, Mathematics, and Engineering, our students and teachers in Maguindanao will be equipped with additional knowledge on various scientific discoveries and innovative technological products,” he added.

In Davao Oriental, 15 STARBOOKS units were distributed to 14 public schools in the province. Recipients were: Badas National High School, Bobon National High School, Buso National High School, Don Enrique Lopez National High School, Dona Rosa G. Gabat Memorial High School, Lawigan National High School, Libudon National High School, Macambol National High School, Mati National Compre High School, Mati School of Arts and Trade, Matiao National High School, Mayo National High School, Taguibo Agricultural Vocational High School, and Manuela S. Nasser Sr. National High School.

Taule stressed that in deploying STARBOOKS, remote areas with no internet connection and limited learning materials have been always the top priority of DOST-STII.

“The support given by UNWFP has provided major boost to DOST-STII’s goal of bringing more STARBOOKS units in the countryside,” said Taule.

He also recognized the contributions of different DOST regional offices such as ARMM



*A teacher from Kabuntulan National High School in Maguindanao explores the features of STARBOOKS during the turnover ceremony at the Cotabato Government Center in Maguindanao. Photo by Allan Mauro V. Marfal, DOST-STII*



*Benguet Governor Crescencio C. Pacalso ceremonially receives STARBOOKS units from Arlene E. Centeno, chief of Finance and Administrative division of the DOST-STII on behalf of the whole province. Also present is Assistant Regional Director Bettina D. Aquino of the Department of Education-CAR. Photo by David Matthew C. Gopilan, DOST-STII*

to promote STARBOOKS and gain significant interests from LGUs, educational institutions, and partner organizations.

Prior to Benguet, Maguindanao, Misamis Oriental, and Davao Oriental, DOST-STII and UNWFP have conducted the first wave of deployment in Batangas and Laguna. The three remaining

provinces who will receive STARBOOKS units under the partnership between DOST-STII and UNWFP are Cagayan, Iloilo, and Sorsogon.

As of 02 March 2017, STARBOOKS has already been deployed to 2,260 sites nationwide.



# #SCIENCE FOR THE PEOPLE



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

**1** 17 March 2018 | Project visit in Zamboanga

**3** 15 March 2018 | Project visit in Sulu

**2** 6 February 2018 | Project visit in Kalibo, Aklan

**4** 31 March 2018 | SFTP discusses DOST's Community Empowerment through Science and Technology program during his interview with ANC's Future Perfect

**5** January 2018 | Sec. de la Peña's first project visit for 2018 in Balay Tablea located in Iloilo City





**WEATHER**



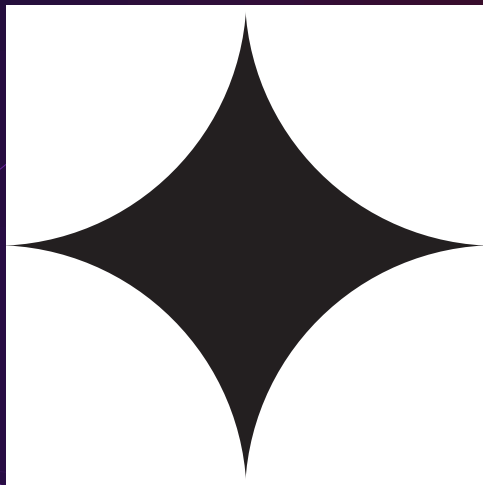
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