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**PARTNERING
FOR CHANGE,
ENGAGING
THE WORLD**

2017 ASEAN Summit Issue





ASEAN @ 50 and the Philippines

It was on 8 August 1967 when five neighboring Southeast Asian countries banded together to become one of the more active players in the global arena. Indonesia, Thailand, Malaysia, Singapore, and the Philippines created what is now known as the ASEAN or Association of Southeast Asian Nations. It has become a regional intergovernmental organization for cooperation, facilitating

economic, political, security, military, educational, and socio-cultural integration among its members. Slowly, the organization started to gain more member-nations. In 1987, Brunei became the sixth member and on 28 July 1995, Vietnam became its seventh member. Laos PDR and Myanmar (Burma) joined on 23 July 1997. Cambodia later joined on 30 April 1999.

Now at 50 years old, ASEAN has proven to be one of the strongest economic players in the world. And on its golden anniversary, the Philippines was given the rare opportunity to lead as it helped pave the way for the ASEAN regional development for the last 50 years and has committed to do the same for the next 50 years and beyond.

For its part, the Department of Science and Technology (DOST) as chair of the ASEAN Committee on Science and Technology (COST), drafted the Declaration on Innovation which was endorsed during the 17th ASEAN Ministerial Meeting on Science and Technology (AMMST) and the ASEAN Economic Community Council. This was adopted by the ASEAN leaders during the 31st ASEAN Summit themed ASEAN@50: Partnering for Change, Engaging the World for Science, Technology and Innovation (STI) held on 12-14 November 2017 here in the country.

It is noteworthy that DOST Secretary Fortunato T. de la Peña mentioned that since the establishment of the organization in 1967, it has continued to live up with the aspiration of having one dream

and one community. He said, "Now we are at the threshold of a new transformative technological frontier where pilotless planes or driverless car and drones are no longer science fiction and we are now in the so called Industrial Revolution which will usher in more complex interconnected innovations."

Meanwhile, DOST Undersecretary for Research and Development and current National COST Chair, Dr. Rowena Cristina L. Guevara, emphasized that the ASEAN forums and parallel events were truly relevant to those coming from the science community, academe, business sector, and stakeholders of future technology especially with topics related to Industrial Revolution 4.0 where humans and computers interact with each other.

Thus, for this issue of the S&T Post, we feature stories related to the ASEAN especially those where the DOST is a key player. People have to be informed on the important roles being played by the country in general, and the DOST in particular. The history-changing hosting of the ASEAN by the Philippines is not just a showcase of pageantry, expense, and traffic according to the cynics in social media, but of the more substantive portion that can propel stronger cooperation for both national and regional socioeconomic development.

Some area specific activities included the partnership on capacity building for ASEAN researchers with special assistance extended to Cambodia, Lao PDR and Myanmar for education. There were also training, conferences, and other activities geared towards sharing of best practices around ASEAN and the beefing up of human resource in various areas.

Aside from other activities held in 2017, the Philippines, through the DOST, has embraced the future now by crafting a number of ASEAN activities for the coming year. The Philippines will likewise host events parallel to COST 75 and IAMMST-10.

In this truly diverse group, the ASEAN member states can be clearly seen moving in unison towards achieving a better future.

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

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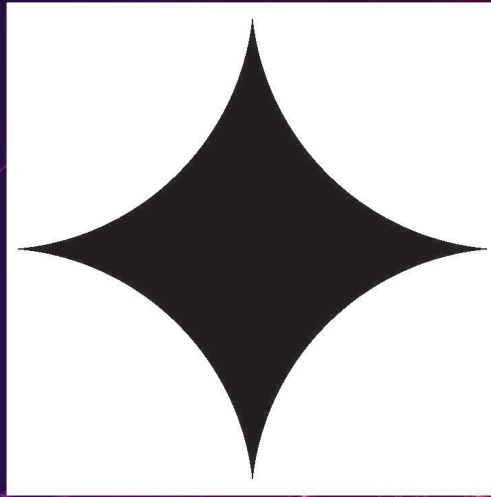
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ABOUT THE COVER



Secretary Fortunato T. de la Peña speaks during the ASEAN Summit 2017 which coincides with the 50th founding anniversary of ASEAN. With the Philippines chairing the Summit, the event becomes more memorable because the country was one of ASEAN's founding members. The Department of Science and Technology led in various initiatives for the event such as in drafting the ASEAN Declaration on Innovation and in proposing various projects for the ASEAN-Committee on Science and Technology. (Cover Design by Josemaria Zarraga, Photo by Henry A. de Leon)

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Inventor turns cooking oil into biofuel

By Keziah Suzanne Francisco, DOST-XI
Photo by DOST-XI

Inventor Emiliano Quitol shows samples of his product called EFQ Bioforce.

USED COOKING oil may be harmful to health but a little bit of science can turn it into an environment savior. This is exactly what Davao-based Emiliano Quitol, an inventor, found out way back in 2003 when he started working on his own biofuel. Now he has perfected his product which he called EFQ Bioforce.

“Fresh cooking oil, after several times of use, is considered a toxic substance and hazardous (to health),” Quitol said.

“Used cooking oil as raw material for the production of EFQ Fuel and Oil Additive will pave the way to solving the proper disposal of used cooking oil and will assure public health and safety,” added Quitol when he pitched EFQ Bioforce to members of the Rotary Club of Davao recently.

His idea stemmed from his resolve to help curb pollution. He said his invention will eventually help restore bodies of water affected with spillage and contaminants that may pollute and destroy the habitat of marine life.

But how does his product work? According to Quitol, adding 1mL of his product to a liter of fuel will act on and rearrange the molecular structure of the conventional fuel into chain branching of hydrocarbon atoms. This allows more efficient fuel combustion and consequently reduces air pollution.

Currently, Quitol already has three kinds of products, namely EFQ Bio Force Diesel Additive, EFQ Bio Speed Gasoline Additive, and EFQ BioPower Engine Oil Additive.

Quitol won in the 2014 Department of Science and Technology (DOST)-National Invention Contest and Exhibit. Later, he availed himself of the Invention Based Enterprise Development Program of DOST-Technology Application and Promotions Institute (IBED). IBED is a program intended to encourage and transform innovations into a technology enterprise. It covers pilot production, field/market testing, and formulation of systems and procedures in preparation for a larger production scale. The program also aims to build the capabilities of inventors to create businesses out of their inventions.

Firm adopts DOST's green charcoal technologies

By Rizalina K. Araral & Carl Anthony O. Lantican, *DOST-FPRDI*

Photo by DOST-FPRDI

A PAMPANGA-BASED green technology firm recently acquired technologies from the Department of Science and Technology-Forest Products Research and Development Institute (DOST-FPRDI) to improve its green charcoal products designed for top players in the country's chicken roasting industry.

Mackay Green Energy, Inc. developed a bamboo hybrid called "bana grass", the hard main stem of which can be turned into charcoal briquettes for industrial use. The company tapped DOST-FPRDI briquetting system and technical help for the project.

A charcoal briquette is a compacted mass of fuel material made from a mix of charcoal fines and a binder, and molded under pressure. It is less messy than ordinary charcoal and easier to handle because it is compact and uniform in size. Also, it easily ignites, burns more slowly, gives more intense heat per unit volume, and is almost smokeless when burning.



Source: Mackay Green Energy Website

"The bana grass briquette is a most welcome development," said DOST-FPRDI's Engr. Belen Bisana. "The use of eco-friendly charcoal can help relieve pressure on the country's mangroves. During the past decade, the heavy dependence on wood charcoal by *lechon* businesses all over the country has been blamed for the depletion of our mangrove forests," Engr. Bisana said.

During DOST-FPRDI's recent technology demo at Mackay, officers from Mang Inasal

Philippines, Inc. were on hand to observe how the bana grass briquettes are made. According to Mackay's Joseph Issifu, aside from Mang Inasal, they have ongoing talks with two other top roasting companies who are interested in their product.

Mackay Green Energy, Inc. acquired 30 manual briquetters, 30 drum kilns, six binder-mixers, and six charcoal crushers from DOST-FPRDI.

DOST-ITDI technologies up for the market

Featured in this issue are some of the recent technologies developed by the Department of Science and Technology- Industrial Technology Development Institute (DOST-ITDI) that are ready for commercialization.

Color production technology

The technology uses two improved strains of *Monascus purpureus* to produce food colors:

- 1) rice substrate
- 2) aqueous media with heat- and moisture-modified starch.

Color from the rice substrate may be extracted with ethanol followed by solvent evaporation. Color from the aqueous media may be spray-dried to obtain color in powder form. Both mutants did not exhibit activity against bacteria which implies low level of citrinin.

The technology is developed by the Industrial Fermentation Section under the Environment and Biotechnology Division of DOST-ITDI.



Freeze-dried avocado

Freeze drying preserves the nutrients, color, aroma, and flavor of the product by means of sublimation, a mild dehydration process.

Advantages/characteristics of freeze-dried avocado:

- Requires no preservatives
- Healthy and nutritious
- Preserves aesthetic, functional, nutritional, and organoleptic properties
- Maintains material structure
- Improves product stability during storage
- Good rehydration characteristics



Freeze dryer

Powdered egg white

Egg white is mainly used as an ingredient in various food products for its gelling and foaming property. However, it has a short shelf life and spoils easily which may lead to a lot of wastage. Through spray drying (using the DOST-developed spray dryer), powdered egg white was developed.

Advantages of powdered egg white:

- Very stable; the powdered egg white has a shelf life of over a year (under ideal storage conditions)
- Convenient to use; it is hassle-and mess-free, since there is no need to separate the yolk from the egg whites
- Does not require refrigeration
- Made from 100 percent egg whites, no bulking agent/ preservatives added
- Easier to handle and transport due to reduced volume



Spray dryer





Vacuum fryer

Vacuum fried carrot chips

Vacuum frying preserves the nutrients of foods by enabling deep-fat frying in lower temperatures and pressure compared with conventional frying.

Advantages of vacuum-fried carrots:

- High quality since there is minimal loss of properties (e.g., color, flavor, nutrients)
- Reduced fat absorption
- Contains less oil than conventionally-fried carrots
- Requires no preservatives
- Crispy
- Healthy and nutritious

Chili oil using water retort

DOST-ITDI's Food Innovation Center-Main developed the chili oil products from the local *siling labuyo* using the DOST-developed water retort. The resulting chili oil products are perfect for viands, chips, and even crackers. The chili oils come in various flavors such as onion, garlic, ginger, dried anchovy, shrimp paste, and anchovy paste.

Advantages of chili oils produced using water retort:

- Builds up appetite
- Shelf-stable
- No sophisticated equipment needed
- Uses locally available raw materials



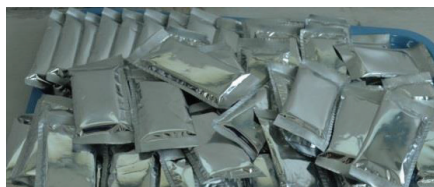
Drum-dried mango flakes

Mango flakes

Mango flakes are drum-dried fresh mangoes (carabao variety) at its optimum maturity (rare ripe with peel color of 80 percent yellow and 20 percent green), with firm texture. Drum drying is a continuous, indirect drying method that allows short retention times while evaporating all the liquid in the product within a single rotation of the drums.

Advantages of drum drying:

- Reduces risk of degradation of the product during storage
- Gives the product its unique properties like taste, color, odor, and texture
- Shelf-stable
- Drum-dried fruits like mango flakes are widely used in food manufacturing (e.g., confectionery, baking, sweets, infant food, sauces, and soups)



Emergency Food Reserve (EFR)

EFR nutri-food powder is made from choice crops like cassava, *camote*, *malunggay*, and *monggo*. It is an energy food that is both nutritious and filling.

Advantages of EFR:

- Ready-to-use powder, needs no cooking/heating, just add water
- Provides immediate hunger relief
- It can be stock-piled and made into various food preparations (e.g., chocolate nutri-bars, *polvoron*, EFR breads, soup, *kutsinta*, *puto*, *bibingka*, and *ukoy*).



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Ma. Dolor L. Villaseñor pitches the Tablea Process Technology to entrepreneurs during the DOST-ITDI Technology Offering Series.

Technologies improve cacao-based products

By Geraldine B. Ducusin, DOST-STII

Photos by Ceajay N. Valerio, DOST-STII

WITH THE government's move to revitalize the cocoa industry, the Department of Science and Technology-Industrial Technology Development Institute (DOST-ITDI) developed globally competitive technologies to enhance locally processed cacao products.

These DOST-ITDI developed technologies, namely cacao (tablea) processing and cacao bean roaster, speed up production time, and improve the quality of cacao-based chocolate. Said technologies are of big help to entrepreneurs producing cacao-based products.

Ma. Dolor L. Villaseñor, a supervisor at the DOST-ITDI's Food Processing Division, pitched to the potential stakeholders from the

business sector that the cacao (tablea) process technology is designed to help the players in the cacao industry produce tablea that are at par with the ASEAN standards.

"The cacao processing technology that DOST-ITDI developed can produce cocoa that is smooth and less acidic than the ones commercially available," she said.

As of 2015, the country produced 14,000 metric tons (MT) of cacao, and 12,000 MT of these were produced in Davao Region.

Meanwhile, the DOST-ITDI developed cacao bean roaster has better features than traditional roasters in terms of ease of use and affordability. This locally fabricated roaster costs around P600,000 while imported ones cost up to P1 million.

"We're targeting the local licensed fabricators for this cacao bean roaster technology," said DOST-ITDI's Rufino T. Barcala Jr.

The DOST-ITDI developed the bean roaster to make the equipment locally available and more affordable to micro, small, and medium enterprises when they adopt the technology.

These cacao technologies will scale down the production cost and improve the quality of locally manufactured chocolate products.

For more details on food processing technologies, please visit <http://www.itdi.dost.gov.ph/>

Locally produced cacao



Wiser with LISER

By Sean Adrian T. Guardiano, *DOST-Negros Oriental*

Photo by Negros Oriental PSTC S&T Media Service



Teachers from primary and secondary public schools program the robots and run it according to the resource person's instructions.

A **TWO-DAY** training workshop organized by the Department of Science and Technology (DOST) through the Negros Oriental Provincial Science and Technology Center introduced LISER to some 30 participants from the province.

LISER or Low-cost Intelligent STEAM Educational Robot is part of the Department of Education's (DepEd) strategies in equipping science and mathematics teachers for robot hardware and programming using the open source MINIBLOQ programming language.

"LISER is a low-cost but helpful robot that can enhance the capability of elementary and high school students so that at a young age, they can already design robots, join robotics trainings and workshops, and most importantly participate in various local and international robotics competitions," said Engr. Diogenes Armando D. Pascua of the University of Science and Technology of Southern Philippines (USTP). Engr. Pascua, together with Engr. Bronson Mabulay, also a faculty member of USTP, served as resource speakers during the said training.

According to its developers, LISER is an inexpensive educational robot aimed to boost STEAM (Science, Technology, Engineering, Arts, and Mathematics) education by teaching robot hardware and programming to public and private elementary and high school students. LISER was developed at USTP and was a recipient of the USAID-STRIDE Prototype Research and Innovation Grants.

LISER is an Arduino-based educational robot that is easy to assemble, easy to use, and is kid-friendly. Arduino is a popular open-source development board that engineers use to develop electronics projects in an easy way.

During the short but very informative training, the speakers extensively discussed LISER robot, its several designs and modifications through the years, programming software used, the MINIBLOQ programming environment, partner institutions, previous collaborations with DOST, and introduction of the LISER team. Participants were able to program the robots and run it according to the codes inputted.

Workshop participants were teachers and information and communications technology coordinators from primary and secondary public schools in the province who were trained on robot hardware and programming as part of efforts to integrate said subjects in the teaching of STEAM among elementary and high school students.

The two-day training workshop on LISER was held on 3-4 November 2017 at the DepEd Dumaguete Division Office, Taclobo, Dumaguete City, Negros Oriental.

Said training affirms DepEd's commitment to holistic academic growth of both teachers and students.

The robotics training workshop was done in cooperation with DepEd Dumaguete and USTP. The LISER team hopes to conduct more robotics training workshops in Negros Oriental. The speakers have been involved in numerous trainings locally and internationally on robotics design and competitions, among others.



Those interested in LISER can contact **0977-334-7536**, e-mail **diogpascua@gmail.com** or visit the LISER Robotics Facebook page.



Sci-Fun Caravan visits Oriental Mindoro

By Djonna Gay Abufera, Jesse M. Pine, *DOST-Oriental Mindoro* and Ma. Josefina P. Abilay, *DOST-MIMAROPA*

Photos by DOST-MIMAROPA

ELEVEN YEARS since its last stop over, Philippine Foundation for Science and Technology's (PFST) Sci-Fun Caravan was back to Oriental Mindoro to give students, teachers, and parents a more enriching, fun, and unique science learning experience.

The Sci-Fun Caravan was stationed in Brgy. Camilmil Gymnasium in Calapan City, Oriental Mindoro from 12 September to 26 October 2017. More than 17,000 attendees from different municipalities in the province had fun learning from the 42 interactive exhibits. Students and visitors learned through self-discovery by manipulation and interaction in the exhibits.

Such unique science learning experience was made possible by the Department of Science and Technology-MIMAROPA (DOST-MIMAROPA) and Provincial Science and Technology Center (PSTC) in Oriental Mindoro. Partnering with DOST in this activity were the Rotary Club of Downtown Calapan (RCDC), Department of Education (DepEd)-Division of Calapan City and Oriental Mindoro, and PFST.

The partnership's main objectives were to introduce more effective learning practices and promote science literacy and awareness to the local youth. The activity likewise supports the RCDC's advocacy which is to promote

and enhance the quality of education in the province.

Sci-Fun Caravan's opening ceremony had important guests that include Oriental Mindoro Governor Alfonso Umali Jr., Calapan City Mayor Arnan Panaligan, PFST Executive Director May Pagsinohin, DepEd representatives Noida Castro and Heide Padua, and members of the RCDC headed by its Great President Guillermo Allegre and President-elect Pastor Steven Saap.

Governor Umali and Mayor Panaligan both supported the initiative of PFST and its partner agencies in advocating science and technology (S&T) consciousness and literacy among the youth and other sectors of society. Mayor Panaligan stressed the importance of inculcating S&T culture among the youth. "They should learn to love and appreciate science and technology since S&T will bring development to the country," he said.

Executive Director Pagsinohin likewise underscored that not all learnings come from inside the classroom. The Sci-Fun Caravan is one of the avenues for alternative but easier learning in basic science concepts and processes, she said.

Further, the caravan is an ideal venue for educational activities aligned to the DepEd's K-12 learning competencies on Earth Science,

General Science, and Physics. PFST even provided free entrance for Camilmil Daycare Center students during the opening day as a treat to the host barangay.

The traveling exhibit's primary aim is to reach communities that cannot visit the PFST's permanent exhibits in its Science Center in Metro Manila due to distance and cost constraints.

Meanwhile, PFST President Engr. Filemon T. Berba Jr., in his message delivered by Engr. Renato T. Goco during the opening ceremonies, emphasized the role of science to the country's development. He said, "We all know that the world is now in knowledge-based environment. Science and technology is a platform that has made progressive countries succeed and minimize, if not eradicate, poverty."

Also, 150 Mangyan students from Baco National High School visited the caravan and given free entrance. The visit was made possible through the Mangyan Kalakbay Mission, Tugdaan Mangyan Center for Learning Development in Naujan, and Talipanan Mangyan School in Puerto Galera. PFST's program "A+ Science Beyond Classroom Project Year 3" provided free transportation and food to the Mangyan students and their teachers—proof that indeed science is for the people.



DOST Undersecretary for Research and Development Dr. Rowena Cristina L. Guevara (seated, left) and MOST-China Vice Minister Huang Wei (seated, right) sign the agreement for the possible areas of collaboration between the Philippines and China. This momentous event was witnessed by DOST Secretary Fortunato T. de la Peña (standing, left) and Philippine Ambassador to China Jose Santiago Sta. Romana (standing, right).

PH, China embark on new era of S&T collaboration

By Denvi E. Gabales, *DOST-ITCU*

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

THE PHILIPPINES and China recently opened a new era of collaboration on projects and activities that will strengthen science and technology (S&T) cooperation between the two countries. The renewal of ties happened on the 14th Philippine-China Joint Commission Meeting on Science and Technology (JCMST) held last 10 November 2017 in Tagaytay City, Philippines.

Hosted by the Department of Science and Technology (DOST), the 14th JCMST served as venue for both the DOST and its Chinese counterpart, the Ministry of Science and Technology (MOST), to agree on areas for future collaboration. Said areas include renewable energy, agriculture, health, remote sensing, satellite data sharing and application, technology transfer, and aquaculture and marine science.

The identified modes of cooperation will be joint research and development, exploratory missions, joint conduct of trainings, exchange of experts, technical workshops/seminars, and technology transfer.

DOST Undersecretary for Research and Development Dr. Rowena Cristina L. Guevara led the DOST delegation. In her welcome remarks, Usec. Guevara underscored that the S&T cooperation in areas of mutual interest will benefit both countries and the meeting will serve as an avenue to strengthen the partnership between the Philippines and China.

Meanwhile, Vice Minister Huang Wei of MOST expressed his deep appreciation to the Philippines for its warm reception to the Chinese delegation and expressed interest

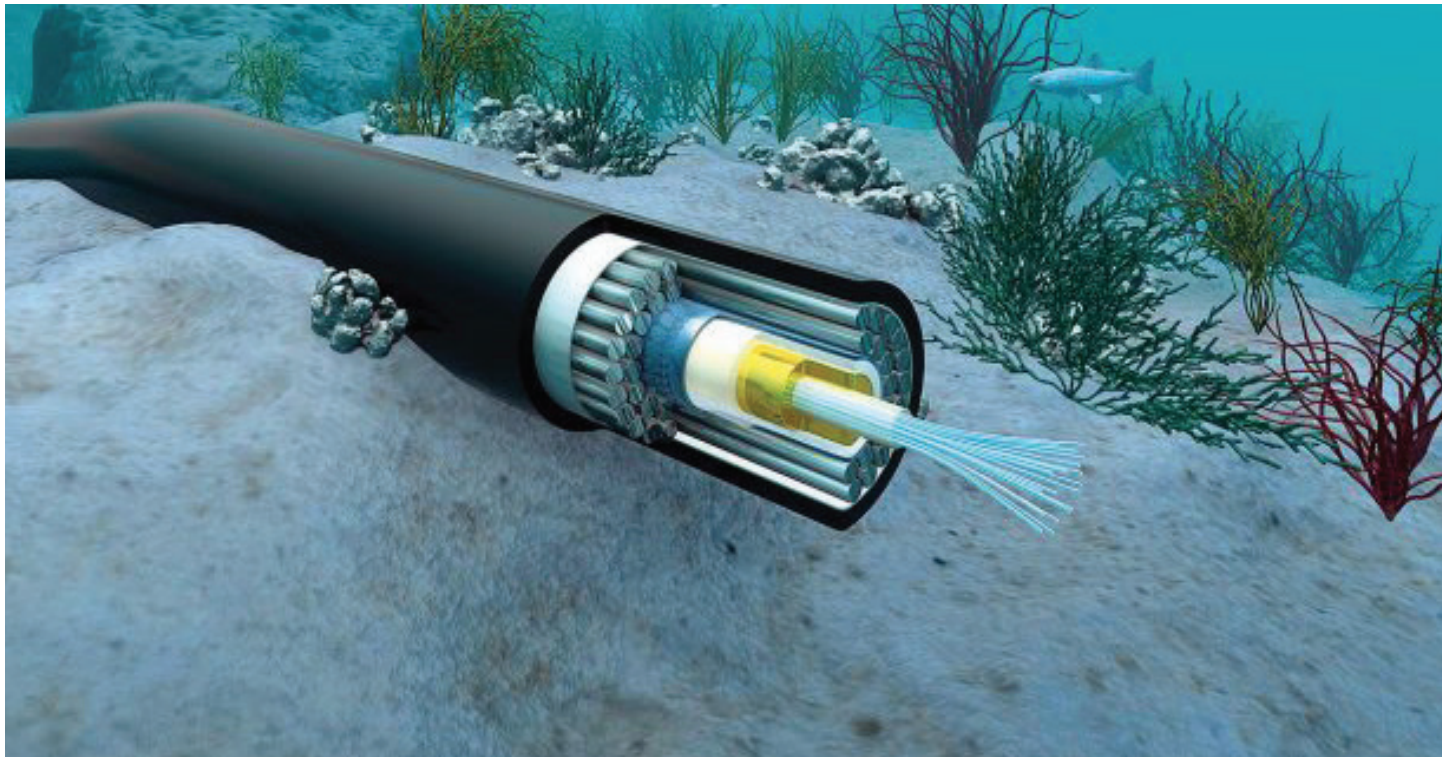
to open a new era of science, technology, and innovation (STI) partnership with DOST that will contribute to socioeconomic development of both countries.

Over the years, the JCMST is being convened to serve as a platform to discuss mechanisms for cooperation between the Philippines and China and agree on the projects and activities to be implemented. Keen on moving forward, the two countries expressed optimism for strong and fruitful collaborative years under the renewed STI partnership.

The existing Basic Agreement on Scientific and Technological Cooperation between the Philippines and China was signed in 1978. The last engagement in the cooperation was the implementation of the Joint Protocol held in 2004.

Submarine cable landing stations to speed up internet connectivity

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



www.relativnews.asia

THE SLOW internet connection in the country may soon be a thing of the past. This was announced by the Department of Science and Technology (DOST) as it welcomed the initiative of the Department of Information and Communications Technology (DICT), the Bases Conversion Development Authority (BCDA), and EDGE (a.k.a. Facebook).

This government initiative is called the Luzon Bypass Infrastructure (LBI) project, the first of its kind for the Philippine government to implement by building and operating its own submarine cable landing stations.

Under the project, the social media giant Facebook will be the first party to use the said infrastructure, thereby benefitting millions of internet users with faster connectivity.

“The signing of the Landing Party Agreement or LPA between the DICT, BCDA, and EDGE for the Philippine government’s first cable landing stations

under the Luzon Bypass Infrastructure Project is a major milestone in the history of ICT (information and communication technology) and development in our country,” said DOST Secretary Fortunato T. de la Peña during the formal unveiling on 15 November 2017 in Taguig City.

The project will pave the way to building an ultra high-speed internet backbone for the entire country by the end of 2019 where internet speed can go up to 100 Mbps.

BCDA will build the LBI made up of two cable landing stations that are connected by a 250-kilometer long cable network corridor. On the other hand, Facebook as the first user will construct and operate a submarine cable system that will land in the cable stations on the east and west coasts of Luzon. This cable link will provide direct access from the Luzon grid to internet hubs in the United States and Asia.

Further, Facebook will provide the Philippine government with a

bandwidth of at least 2 million Mbps (or 2 Tbps) that is almost similar to the bandwidth being provided by the leading telecommunications companies in the country.

For its part, the DICT will operate the LBI and maintain the related facilities and provide last mile connectivity in the Philippines for a period of 25 years.

Sec. de la Peña disclosed that under this agreement, the Pacific Light Cable Network, a trans-Pacific fiber optic submarine cable system managed by EDGE, will be provided a “terrestrial bypass route” across Luzon through infrastructure to be built by the BCDA. The cable will enter and exit the country through government cable landing stations in Baler, Aurora and San Fernando, La Union, respectively. This bypass route will provide diversity and redundancy to the usual route of submarine cables crossing the Pacific.

The LPA signing is the result of years of planning, discussions, and negotiations

among stakeholders. Tracing back the events, the linkage was first made through the efforts of the DOST-Advanced Science and Technology Institute (ASTI) and DICT, which was formerly known as the Information and Communications Technology Office (ICTO), which was then under the DOST. The DOST-ASTI, through its PREGINET (Philippines Research, Education, and Government Information Network) initiative, worked to establish strategic linkages in pursuit of its advocacy for an open, reliable, and efficient connectivity for supporting research, education, and innovation. EDGE was one of those important linkages.

According to the science chief, the government program will provide

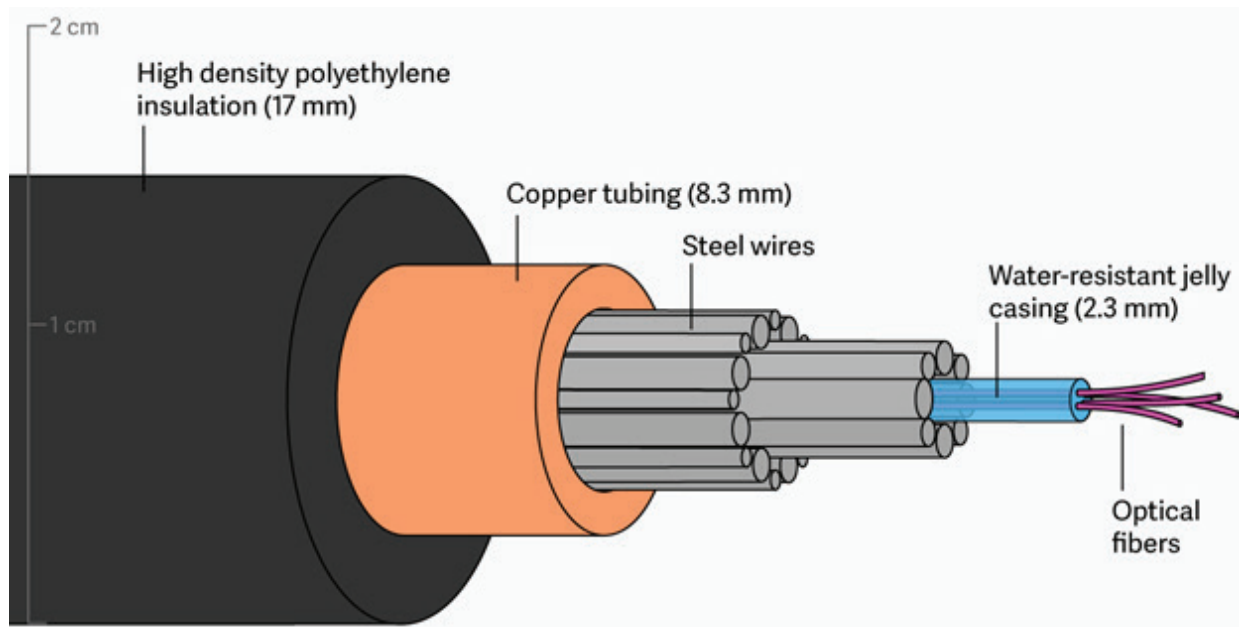
international connections to local businesses and strengthen the country's digital bridge to the rest of the world. While the signing of the LPA is a major step in that direction, there is still the need to complement this with efforts on last mile infrastructure and in promoting local internet exchanges which the government is doing via the Free Wi-Fi, iGov, and PHOpenIX initiatives.

"In ending, we have long recognized that an efficient and affordable ICT is a key ingredient in boosting our country's global competitiveness," Sec. de la Peña said. "We have heard about how ICT technologies and applications have enabled our neighbors to achieve even more economic growth and prosperity. We have seen how societies and

communities have flourished through better, faster, and more pervasive connectivity."

"This, too, is our aspiration for our country. Moreover, it is our commitment to our people," Sec. de la Peña concluded.

Present during the signing of the LPA were National Security Adviser General Hermogenes C. Esperon Jr., (Ret.), Presidential Communications Operations Office Secretary Jose Ruperto Martin Andanan, DICT Undersecretary Eliseo M. Rio Jr., Presidential Adviser on Economic Affairs Ramon Jacinto, BCDA President and CEO Vince Hizon, BCDA Board Chairperson Gregorio D. Garcia, EDGE Sourcing Manager for Asia and the Pacific Nico Roehrich, and EDGE Phils Policy Head Anne Marie Carominas.



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SETUP adoptors get financial boost from DBP



Photo by DBP

<https://www.devbnkphl.com/>

TECHNOPRENEURS WHO are adoptors of the Department of Science and Technology's (DOST) Small Enterprise Technology Upgrading Program (SETUP) can now avail of additional capital to improve their facilities, purchase additional equipment, and obtain additional working capital through a loan from the Development Bank of the Philippines (DBP) through the DBP BEST program.

DBP BEST, short for DBP Bankability Enhancement for SETUP Technopreneurs, is a specialized lending facility that addresses the financing needs of SETUP beneficiaries who have graduated or will be graduating from the financial assistance of DOST's SETUP.

This was made possible after DOST and DBP signed a memorandum of agreement (MOA) in February 2017 to formalize their partnership that will allow SETUP beneficiaries nationwide to obtain a loan through DBP BEST.

As of 30 November 2017, the total loan approvals amounted to P69.5 million and P33 million have already been released to qualified SETUP technopreneurs.

The partnership signifies DOST's and DBP's shared commitment to the attainment of the Sustainable Development Goals through the promotion of development oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation,

and to encourage the formalization and growth of micro, small, and medium enterprises (MSMEs), including access to financial services.

"Through our complementary programs, we at DBP envision to effectively bridge the financing gap for graduating SETUP technopreneurs under the DBP BEST program," said Cecilia C. Borromeo, president and chief executive officer of DBP. Borromeo credited DOST Secretary Fortunato T. de la Peña for the initiative to have an encompassing national MOA for the said program.

Both parties recognize that cooperation between them will better facilitate growth and development of MSMEs in the country,

especially through their complementary programs. Under the agreement, DBP shall offer complementary credit facilities and other banking services to eligible and qualified SETUP beneficiaries, while DOST will assist in identifying clients ready to be transitioned to formal banking.

DBP BEST provides loans for working capital and acquisition of fixed assets such as factory, office building, and other equipment “to support the development and growth of the various business endeavors of the DOST’s SETUP technopreneurs.” The program is

primarily geared towards transitioning SETUP technopreneurs to formal banking.

According to DBP, the program aims to harness the potential and capabilities of SETUP technopreneurs as catalyst for job creation and local economic development; contribute toward an improved standard of living through the financing and support of SETUP technopreneurs’ entrepreneurial activities; and enhance the bankability of SETUP technopreneurs.

SETUP, on the other hand, is DOST’s program that encourages and assists MSMEs

in adopting technological innovations to boost their productivity and competitiveness.

The DBP BEST program has initially benefitted some 89 SETUP beneficiaries with a total aggregate loan amounting to P169 million as of May 2017.

The MOA signing between DOST and DBP was held on 27 February 2017 at the DBP head office in Makati, with DOST Sec. de la Peña and DBP president and CEO Borromeo. **(By Sheila Marie Anne J. de Luna, DOST-STII, with reports from the Development Bank of the Philippines.)**



How to avail of the DBP Best program

SETUP TECHNOPRENEURS who are interested to avail of the loan facility assistance from DBP BEST must complete the following general requirements: letter of intent; filled up application form, customer record form, and confidential information sheet (all DBP forms); certificate of business registration (from Department of Trade and Industry, Securities and Exchange Commission, Cooperative Development Authority, and Department of Labor and Employment); business permit from local government unit, income tax returns and financial statements for the past three years (if applicable); statement of assets, liabilities and net worth of principal borrower/s; and bank statement for the last three months.

Interested parties also need to submit their business plan that includes projected income and cash flow, and a filled up DBP form that gives authority for the bank to conduct inquiry and provide credit information to/from credit bureaus and other bank/creditors.

For corporations and cooperatives, aside from the general requirements, they also need to submit their by-laws and articles of incorporation/corporation, and a Board Resolution and Secretary’s Certificate authorizing the loan and indicating the authorized signatories and authorized person to transact the loan.

Those who are eligible to borrow under the lending program are SETUP beneficiaries who have completed one cycle or at least 1.5 years of refund to DOST under SETUP. DOST shall issue a certification indicating satisfactory refund experience. Also, those who have not availed of the technology financial assistance from DOST may still be eligible and shall be evaluated on a case to case basis. Single proprietorship, partnerships, corporations, cooperatives, and other business entities with legal personality to engage in a business enterprise with asset size of P100 million and below are eligible to avail of the program.

The program is available to all types of MSME projects, especially to those owned and/or managed by SETUP technopreneurs. SETUP beneficiaries who are eligible to avail of the program can borrow for working capital, capital expenditures (building construction, plant/project expansion, fixed asset/equipment acquisition); and for purchase order/letter of credit financing.

DBP BEST gives assistance to the following priority sectors that require technological improvements in their existing operations: food processing, furniture, gifts, housewares, decors, marine and aquatic resources, horticulture and agriculture, metals and engineering, health products and services/pharmaceuticals, and information and communications technology/electronics.

Lenders can borrow up to 90 percent of the project cost, but with a minimum loan amount of P300,000. For Purchase Order/Letter of Credit financing, borrowers can avail of up to 80 percent of the total amount of the instrument or based on the actual cost of the goods purchased.



DOST Secretary Fortunato T. de la Peña (middle), along with Undersecretary for Regional Operations Brenda L. Nazareth-Manzano (leftmost), Undersecretary for Scientific and Technical Services Dr. Carol M. Yorobe (second from right), and DOST-CALABARZON Regional Director Dr. Alexander R. Madrigal (rightmost) present the token of appreciation to Temasek Foundation International Chief Executive Benedict Cheong (second from left).

Tech revolution steps up food safety in PH

By Jasmin Joyce P. Sevilla, DOST-STII

Photos by Henry A. de Leon, DOST-STII

“WE HAVE an on-going technology revolution to address the country’s mounting issues on food safety,” announced Department of Science and Technology (DOST) Secretary Fortunato T. de la Peña during a food safety training held in Manila. The “technology revolution” is the convergent application of science, technology, research, and innovation done in collaboration with Singaporean organizations Temasek Foundation International (TFI) and Nanyang Polytechnic International (NYP), the Secretary said. Said technology revolution aims to help manage and further advance the country’s issues on food safety as the Philippines is one of the countries facing critical challenges on this aspect.

Spearheaded by DOST-CALABARZON, the media event was organized as a way of recognizing the technical assistance of the two organizations in providing a holistic technological training to the country’s food safety experts.

TFI is a Singaporean philanthropic organization, while NYP is a renowned

training institution on innovation and enterprise. These two organizations tied up with DOST to conduct a three-week training in Singapore last June on food control and food safety monitoring among selected representatives from the following institutions: 17 DOST regional offices and three DOST-attached agencies (DOST-Philippine Council for Industry, Energy and Emerging Technology Research and Development, DOST-Food Nutrition Research Institute, and DOST-Industrial Technology Development Institute); Department of Health, Food and Drug Administration, Department of Agriculture–National Meat Inspection Service, and National Food Authority–Food Development Center.

One of the main objectives of the said training is to address the emerging national challenges in food and safety concerns. “We have to ensure safety at every segment of food preparation—the way food is produced, traded, and delivered to consumers, along

with managing health risks and combating fraudulent practices,” added DOST Sec. de la Peña.

To help in this endeavor, DOST and the other agencies who were part of the training developed programs to further strengthen the assistance provided to micro, small, and medium enterprises through consultancy and laboratory testing for them to comply with international food standards. During the media event, selected participants from the training shared the actual outcome of their programs as well as its effect on addressing food safety concerns in the country.

Among the participants who discussed their outcome presentations was Dr. Anthony Sales, regional director of DOST-XI.

On the senior level, Dr. Sales highlighted the four components of Integrated Food Safety Program (IFSP) for their region which are: (1) IFSP Research and Development Program (2) Enhancement of Food Testing Capabilities;

(3) DOST Human Resource Development Program; and (4) Technology Transfer on Food Safety.

IFSP is anchored on the Food Safety Act of 2013. Once fully implemented and applied in the region, the program aims to have food safety for everyone by 2022.

To discuss the training outcomes on the managerial level, Atty. Anabelle C. De Veyra, director of FDA-Visayas cluster, shared with the media that for the Visayas cluster alone, 34 food safety trainings have been organized and attended by 1,684 participants. Atty. De Veyra

also said that the trainings helped increase the number of food establishments applying for license to operate with FDA, and producers of local food delicacies seeking technical assistance for product registration. The trainings also helped create consumer awareness that resulted in reporting of adverse reaction and fake or substandard food products.

On the other hand, Diana Cecilia Z. Estrella, science research specialist from DOST-III, shared some of the food safety developments on the specialist level such as

the use of rapid test methods in the laboratory, acquisition of new equipment in improving laboratory services relevant to food safety, expansion of scopes of laboratory tests, additional test services, quarterly cascading of Basic Food Hygiene and Good Manufacturing Practices conducted by laboratory personnel, and laboratory personnel involvement in food safety projects of the regional office.

The Food Safety and Technology Training Program and Media Event was held on 24 October 2017 at the Manila Hotel, One Rizal Park, Manila.

*“It was more than just a training program.
We learned from the participants as much
as they learned from us.”*

Benedict Cheong

TFI Chief Executive





“ We have to promote science at a deeper level so that the students, the public, and the private entities would realize that there is something more beyond these technology courses. **”**

Dr. Alexander R. Madrigal
Regional Director, DOST-IV A
and LBSCFI President

Science tourism program kicks off in Los Baños

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

TO FURTHER promote tourism in the municipality of Los Baños, Laguna, the Los Baños Science Community Foundation, Inc. (LBSCFI) launched the development of science tourism in Los Baños on 6 December 2017 at the Innovation and Technology Center of the Department of Science and Technology (DOST)-Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development

This two-year project is a collaboration among the 22 member-agencies of Department of Tourism (DOT)-CALABARZON and Department of Education (DepEd)-CALABARZON.

Dubbed as the “Special Science and

Nature City of the Philippines,” the town of Los Baños serves as a hub for local and international research institutions to collaborate for the advancement of research and development in the Philippines and its neighboring countries.

In addition, Dr. Alexander R. Madrigal, LBSCFI president and DOST-CALABARZON regional director, proudly shared during the program launching that Los Baños is one the most active science communities in the Philippines due to the town’s committed involvement in science endeavors.

Aside from promoting science and technology (S&T), the LBSCFI developed the

science tourism branding to help increase the number of tourists visiting Los Baños. As emphasized by Director Roberto P. Cereno, chair of LBSCFI Tourism Committee, the said science tourism branding is the first of its kind in the region and in the country so it is a huge step forward for the municipality of Los Baños and the whole of CALABARZON as well.

Further, Director Cereno also discussed the strategic action plan for the development of the Science Tourism Program. Generally, they’re eyeing to promote science-based tourism products in the area such as the famous buko pie and chocolate milk, science-oriented travel or visits in Los Baños’

heritage sites such as the Mount Makiling Forest Reserve, and science tourism events like the SiyenSaya, their local adaptation of the National Science and Technology Week celebrated annually.

Present also in the event was DOST-CALABARZON Regional Director Rebecca

V. Labit, who said that boosting the tourism in Los Baños through this program would not only promote S&T in their region but it would also create jobs and opportunities for the locals in the area.

The program launching ended with the signing of a memorandum of

agreement to formalize the partnership among LBSCFI headed by Dr. Madrigal, DOT-CALABARZON Director Labit, and DepEd-CALABARZON represented by Public School District Supervisor Dr. Allan G. Hostalero, in lieu of Regional Director Dr. Diosdado M. San Antonio.



(Seated, from Left to Right) LBSCFI President and DOST-CALABARZON Regional Director Dr. Alexander R. Madrigal, DOT-CALABARZON Regional Director Rebecca V. Labit, and DepEd-CALABARZON Public School District Supervisor Dr. Allan G. Hostalero, present the signed Memorandum of Agreement during the launching of Science Tourism Program in Los Baños.

Vigormin helps keep Siargao water safe

By Gabrielle T. Espinosa, *DOST Caraga*

Photos by Lysinder Bariquit, *DOST Caraga*

SAFE WATER may be the next attraction in Siargao as the island puts on board the Eco-friendly Septic Tank System or Eco-sep. This technology consists of a septic water management system that addresses the problem on untreated wastewaters in resorts, public establishments, and households.

Launched in Siargao in September 2017, the Eco-sep technology is installed in three pilot sites, namely General Luna Market, General Luna High School, and Traveler's Beach Resort.

"Samples collected from these sites will serve as a baseline for the Department of Science and Technology (DOST) to encourage resort owners, local government offices, and households to adopt the technology in our campaign [as part of the project]," said Engr. Noel Ajoc, project coordinator from DOST Caraga.

Dr. Merlinda Palencia, developer of the Eco-sep technology, explained that the Eco-sep system deployed in the pilot sites contains Vigormin, an organomineral that hastens the decomposition

of harmful bacteria that lodge in septic tanks. Vigormin prevents bacteria from escaping from the tank, thus avoiding contamination of wastewater in sewage systems.

Palencia noted that the Eco-sep system will be very efficient in Siargao. Most septic tanks in the island have a bottomless design which allows wastewater to quickly seep through the ground. This poses higher risk of contamination in freshwater and seawater.

"Eco-sep will make an impact to Siargao since the source of its ecotourism are the pristine, fresh and very clean water along its beaches," said Palencia. "We don't want Siargao to follow the footsteps of other tourist areas where fecal bacteria are already in seawaters," she added.

DOST Caraga Regional Director Dominga D. Mallonga also assured that DOST will always continue its support in sustaining ecotourism in the island.

"With the development comes challenges



from the increasing influx of tourists in Siargao. DOST will always be along the way so that we will be able to plan out carefully and avoid problems in solid waste management and food safety," said Mallonga.

The Eco-sep technology is funded by the DOST-Philippine Council for Industry, Energy and Emerging Technology Research and Development. Its launch in the island was participated in by scientists, local government units, government agencies, educators, volunteer groups, and students.

During the launch of the technology, DOST also introduced other projects for Siargao such as food-based livelihood for the elderly, IT-enabled livelihood, and DOST's digital science and technology library called STARBOOKS (Science and Technology Academic and Research-Based Openly Operated Kiosk).

Why you need to wash kangkong longer

By Geraldine B. Ducusin, DOST-STII

VEGETABLES ARE known as healthy food. However, not all of them are. Some vegetables may contain heavy metals and bacteria that may cause sickness when ingested.

In the study “Lead, Cadmium and Bacterial Determination in *Kangkong* Sold in Selected Markets of Bacoar”, results show that there are fewer bacteria in *kangkong* or water spinach sample that has been washed longer.

The study investigated the levels of lead, cadmium, and bacterial contamination in *kangkong* (*Ipomoea aquatic*) sold in selected markets in Bacoar City. The researchers randomly collected fresh *kangkong*. The samples were tested after being washed for one minute, three minutes, and five minutes.

Bacteria were cultured and incubated for 24 hours. The findings show that there are fewer bacteria on sample that has been washed for five minutes.

“The study is very interesting because *kangkong* is consumed by most Filipinos. However, further studies and more samples are needed, so we can determine if what we are consuming is within acceptable limits,” said

Joselito A. Carteciano, head of the information section of the Department of Science and Technology-National Research Council of the Philippines (DOST-NRCP).

The results of these studies were exhibited in the 17th Conference of the Science Council of Asia which was jointly organized by the DOST-NRCP, the Science Council of Asia, and the Science Council of Japan.



Allowance affects teens' nutrition

By Geraldine B. Ducusin, DOST-STII

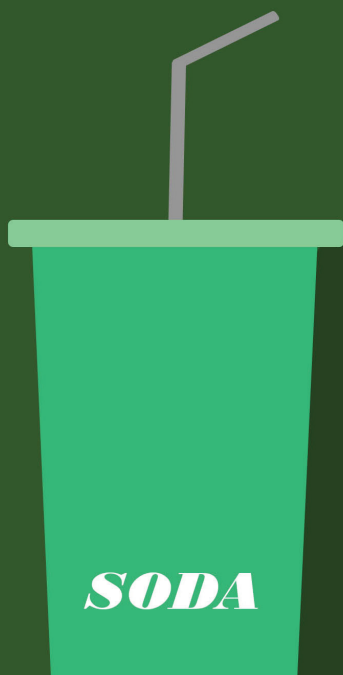
THE RESEARCH titled “Examining the Relationship of Daily Money Allowance, Sugar-sweetened Beverages Consumption, and Level of Nutrition Knowledge on the Nutritional Status Among a Select Group of Filipino Adolescents” finds a relationship between daily monetary allowance and sugar-sweetened beverage consumption. Sugar-sweetened beverage could also affect the nutritional status. However, the level of nutrition knowledge did not affect the nutritional status.

Conducted by the team of Beatrice Joy C. Fuertes of the Nutrition and Dietetics Department of the University of Sto. Tomas, the study had 200 senior high school students as respondents.

The research aims to investigate the relationship of daily money allowance, sugar-sweetened beverages and level of nutrition knowledge on the nutritional status of selected group of Filipino adolescents.

The researchers suggest that market regulation for the sugar-sweetened beverages among students should be followed. Students should also be provided with nutrition education, behavior-based interventions, and health-friendly environment.

The study was on exhibit at the 17th Conference of the Science Council of Asia which was jointly organized by the Department of Science and Technology-National Research Council of the Philippines, the Science Council of Asia, and the Science Council of Japan.





Pinggang Pinoy, an easy guide to good nutrition

By Ma. Susana O. Encarnacion, DOST-FNRI

THE BIRTH of Pinggang Pinoy or the Filipino food plate came as a clamor from the nutrition community to develop a food guide based on a per meal basis for a healthy adult.

Contrary to what others thought to be a replacement of the Daily Nutritional Guide (DNG) Pyramid for Filipinos, Pinggang Pinoy serves as a quick and easy guide in determining how much to eat per meal from each of the three basic food groups.

The DNG Pyramid, on the other hand, shows at a glance the whole day's healthy food intake recommendation for Filipinos in order to have a balanced diet.

Both tools are based on the latest scientific findings about how food, drink,

and activity choices affect people's health.

Food guides themselves are not unique. In fact, almost every country has its own version of a food guide.

So what makes Pinggang Pinoy unique? As its name suggests, Pinggang Pinoy is specially designed for Filipinos which features the Go, Grow and Glow foods represented by food items commonly consumed by the population.

The Go food group, for example, is represented by a bowl of rice, a staple food among Filipinos, the *tilapia* fish represents Grow food, and banana and *malunggay* leaves for Glow food.

Also included in Pinggang Pinoy's simple and graphic design is a picture of a glass of

water to stress the importance of sufficient water intake, and figures in jogging position to represent the importance of regular physical activity.

Recognizing the different nutrient requirements of the different age groups, the Department of Science and Technology-Food and Nutrition Research Institute (DOST-FNRI) has recently developed the Pinggang Pinoy plates for children, adolescents, pregnant women and lactating mothers, and the elderly.

It is the vision of the DOST-FNRI to provide innovative and timely food and nutrition tools that will ensure a healthy and well nourished Filipino population.

Coco milk helps improve kid's weight

By Ross Hettinger and Marilou R. Galang, DOST-FNRI

DID YOU know that coconut skim milk and dairy-coco milk blend can provide similar benefits as cow's milk in helping reduce underweight and stunting among children?

A study conducted by the Department of Science and Technology–Food and Nutrition Research Institute found that coconut skim milk or a dairy-coco milk blend can provide children the necessary nutrients as well as cow's milk.

The study randomly allocated underweight and stunted schoolchildren into three groups. The children in each group were given 200 milliliters of unbranded liquid form of either cow's milk, coconut skim milk or the dairy-coco milk blend for a 95 feeding-day period.

A significant increase in the mean weight and height of all participants was noted after the 95 feeding-day period of the study. Similarly, carbohydrate, protein, fats, and calcium intakes significantly increased in all milk type groups and contributed to increasing the total energy intake of the children.

All children in the study indicated that they “like very much” or “like moderately” all types of milk used in the study.

As the study shows, cow's milk is not the only way to give your children the extra boost they need to grow properly, coconut skim milk or dairy-coco milk blend are good alternatives as well.



For more information on food and nutrition, contact Dr. Mario V. Capanzana, director of the Food and Nutrition Research Institute, Department of Science and Technology, General Santos Avenue, Bicutan, Taguig City; Telephone/Fax Nos: 837-2934 or 837-3164; Direct Line: 839-1839; DOST Trunk Line: 837-2071-82 local 2296 or 2284; e-mail: mvc@fnri.dost.gov.ph or at mar_v_c@yahoo.com; or visit DOST-FNRI website: <http://www.fnri.dost.gov.ph>, Facebook page: facebook.com/FNRI.DOST, or Twitter account: twitter.com/FNRI_DOST.



PH in the forefront of ASEAN dev't in the next 50 years

By Rodolfo P. de Guzman, *DOST-STII*
Photos by Henry A. de Leon, *DOST-STII*

As chair of this year's ASEAN Summit which coincides with ASEAN's 50th founding anniversary, the Philippines strengthens its commitment in helping build a better ASEAN for the next 50 years and beyond.

The Philippine chairmanship in the Association of Southeast Asian Nations (ASEAN) Summit 2017 provided the country the rare opportunity to take on the driver's seat and pave the way in helping achieve the ASEAN regional development for the next 50 years. The country's chairmanship interestingly coincides with ASEAN's 50th founding anniversary.

One of the main initiatives of the Philippines in the Summit is the drafting of the ASEAN Declaration on Innovation through the Department of Science and Technology (DOST). The Declaration was adopted on 13 November 2017 by the ASEAN leaders during the 31st ASEAN Summit dubbed ASEAN@50: Partnering for Change, Engaging the World.

It was previously endorsed at the 17th ASEAN Ministerial Meeting on Science and Technology (AMMST-17) on 20 October 2017 in Nay Pyi Taw, Myanmar, and the ASEAN Economic Community (AEC) Council.

The Chair's statement made clear his appreciation on "the progress made towards the drafting of the ASEAN Declaration on Innovation, which encompasses the guiding principles and strategies to strengthen the ASEAN innovation ecosystem."

ASEAN: one dream, one community

DOST Secretary Fortunato T. de la Peña said that the ASEAN, since it was established in 1967, continues to live up with the aspiration of having one dream, one community, one ASEAN.

"Now we are at the threshold of a new transformative technological frontier where pilotless planes or driverless car and drones are no longer science fiction," Sec. de la Peña further said. "We are now in the so called Industrial Revolution 4.0 which will usher in more complex interconnected innovations."

Meanwhile, DOST Undersecretary for Research and Development and current ASEAN National Committee on Science and Technology (COST) Chair Dr. Rowena Cristina L. Guevara stressed that the ASEAN forums and parallel events were highly relevant to the science community, academe, business sector, stakeholders, and partakers of future technology. Topics related to the future of industry, the 4th era of industrial revolution where humans and computers interact with each other, are the most relevant, she said.

DOST pushes knowledge sharing

As the DOST takes up the challenge, it relies on the strength of its attached agencies, each with its own scientific expertise. Tapping the best human resource, the DOST organized and hosted several initiatives geared at supporting ASEAN.

One was the 1st ASEAN Packaging Conference held on 26-27 October 2017 that focused on new trends and development in packaging technology, engineering and design, as well as international standards. DOST-Industrial Technology Development Institute organized the conference in collaboration with the Packaging Institute of the Philippines.

Another was the ASEAN TELA Conference and Exhibit organized by DOST-Philippine Textile Research Institute and the ASEAN Foundation. Held on 8-10 November 2017, the event provided open discussions by textile experts on the latest state of the ASEAN region's textile industries and innovations in handloom weaving and use of natural dyes. On the last day of the Conference, a fashion show was held, featuring traditional and modern ASEAN textile.

For the agriculture sector, DOST-Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development and Department of Agriculture-Bureau of Plant Industry organized the International Conference on Harmonization of Biosafety Guidelines and Research Protocols on Biosafety for Agricultural and Fishery Products Derived from Modern Biotechnology held on 27-29 November 2017.

The ASEAN Network for Drugs, Diagnostics and Vaccine Innovation (ASEAN NDI) forged a harmonious collaboration in health research and development in ASEAN with the Declaration of ASEAN Concord II in Bali, Indonesia and the 12th ASEAN Summit in Cebu City on 13 January 2007. The DOST-Philippine Council for Health Research and Development manages the initiative and acts as the network secretariat. The network developed a web-based search facility for researchers called the ASEAN NDI Online Search System (ASEAN NDI Search).

Through the DOST, the Philippines also proposed several initiatives under the ASEAN COST and were approved last 73rd Meeting of the ASEAN Committee on Science and Technology in Myanmar. The Philippines, through DOST, has embraced the future now by crafting a number of ASEAN activities slated for 2018. (ASEAN-Committee on Science and Technology)

Embracing the future now

The various activities, where the Philippines takes the lead, showcase the country's commitment to the ASEAN community, and its aim of continuously staying on the forefront of ASEAN activities.

“Recognizing the role of science, technology and innovation (STI) as a key driver in economic growth, we welcomed the adoption of the Implementation Plan by the ASEAN Science and Technology Ministers to operationalize the adopted ASEAN Plan of Action on Science, Technology and Innovation (APASTI) 2016-2025.

We appreciated the progress made towards the drafting of the ASEAN Declaration on Innovation, which encompasses the guiding principles and strategies to strengthen the ASEAN innovation ecosystem.

We welcome the initiative on the establishment of the ASEAN STI Partnership Contributions and were pleased to note that the Philippines and Thailand had individually pledged USD1 million towards this Contribution.”

(Excerpt from the Statement of the Chair, signed on 29 April 2017 in Manila, Philippines)



PH allots US \$1M to ASEAN S&T scholarship

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

One million dollar worth of scholarship grant is no loose change and will surely go a long way to fund the aspirations and dreams of ASEAN researchers including Filipino scientists and engineers. This million-dollar scholarship grant is part of the Philippines' commitment in supporting ASEAN initiatives to strengthen human resource development in the field of science and technology. The fund will be used for scholarship and training of ASEAN researchers with special assistance to researchers from Cambodia, Lao PDR, and Myanmar (CLM).

Implemented by the Philippines through the Department of Science and Technology-Science Education Institute (DOST-SEI), the program will usher in a new era in human resource exchange in science, technology and innovation (STI) in terms of scholarship grants.

The Philippines, through this commitment, now stands at par with other ASEAN countries that also pledged same support to the program like Singapore, Malaysia, Indonesia, and Thailand. The commitments were made during the 9th Informal ASEAN Ministerial Meeting on S&T (IAMMST-9) held on 29 October 2016 in Siem Reap, Cambodia.

The scholarship program complements the Declaration on Innovation prepared by the DOST and endorsed at the 17th ASEAN Ministerial Meeting on Science and Technology (AMMST-17) held in Myanmar last year and the ASEAN Economic Community (AEC) Council. The Declaration was later adopted by ASEAN leaders on 13 November 2017 during the 31st ASEAN Summit held in Manila and chaired by the Philippines.

Harnessing human capital

This commitment, one of the many initiatives of the Philippines to the ASEAN through the DOST, reflects the lead role of the Philippines in harnessing human capital by providing ASEAN researchers the opportunity to study in Philippine universities. This also serves as an affirmation of the high quality standard for post-graduate studies offered in the country.

To date, the DOST-SEI has already interviewed 23 applicants from CLM who went through a series of tests as part of the assessment process.

Successful applicants may enroll in leading universities in the country like the University of the Philippines Los Baños, UP Manila, or De La Salle University.

The program leads the way to a free flow of information among researchers in the region, especially for collaborative work that addresses common concerns, such as in food technology, disaster risk reduction, remote sensing technology, information communication technology, enterprise development, packaging technology, and others.

The practical application of research studies in providing solutions to many modern day problems reaches the public as products and services that improve the people's quality of life.

Likewise, this program will enable the scholar-researchers to build strong networks open to sharing expertise in various fields of disciplines. Such networks strengthen STI capabilities in home countries as well as in the entire ASEAN region.

Capacity building through trainings

To further promote capacity building in ASEAN, the Philippines also hosted several non-degree training programs in 2017 with Filipino scientists and engineers sharing their expertise in different fields.

For one, participants from the ASEAN member states went through a short course on light detection and ranging or LIDAR on 26-30 June 2017 at the UP National Engineering Center.

Also held were two trainings on genomics and bioinformatics at the Philippine Genome Center and at the Computational Science Research Center in UP Diliman on 25-29 September 2017 and 16-20 October 2017, respectively, with participants from Cambodia, Brunei Darussalam, Lao PDR, and Myanmar.

Resource persons from Indonesia, Malaysia, Singapore, Thailand, and the Philippines likewise shared their experiences on the establishment and operation of food innovation centers in their own countries. This was held during the Seminar Workshop on Best Practices of Establishment and Operation of the Food Innovation Center (FIC) on 16-17 October 2017 with the aim of creating an innovation-driven economy with deep science, technology, and innovation enculturation.

Lastly, the Philippines, through the DOST, hosted the 5th ASEAN Workshop on Remote Sensing Ground Station Experts Exchange on 4-6 December 2017. The workshop enabled participants to work on significant amount of empirical data and human power for various applications using remote sensing technologies. Incidentally, it also served as an information exchange platform on space technology and applications.

National Committee on Science and Technology Chair -Philippines, Dr. Rowena Cristina L. Guevara, also DOST undersecretary for research and development, said that the ASEAN forums and parallel events were highly relevant to those coming from the science community, academe, business sector and stakeholders, and partakers of the future technology especially with topics related to the Industrial Revolution 4.0, the fourth era of industry, where humans and computers interact with each other.

The way forward

Moving forward, the Philippines is on its peak of commitments to the ASEAN community and consistently moves toward the forefront of more ASEAN activities.

ASEAN has shown remarkable progress since it was established in 1967, living up with the aspiration of having one dream, one community, one ASEAN, said DOST Secretary Fortunato T. de la Peña.

"Now we are at the threshold of a new transformative technological frontier where pilotless planes or driverless car and drones are no longer science fiction," Sec. de la Peña said. "We are now in the so called Industrial Revolution 4.0 which will usher in more complex interconnected innovations that will disrupt more businesses, communities, homes, and the way individuals think."

"The urgency to reinvent has risen as the next wave of inventions go mainstream. With this, we achieve our main objectives of showing you a glimpse of the future of technology," he concluded.

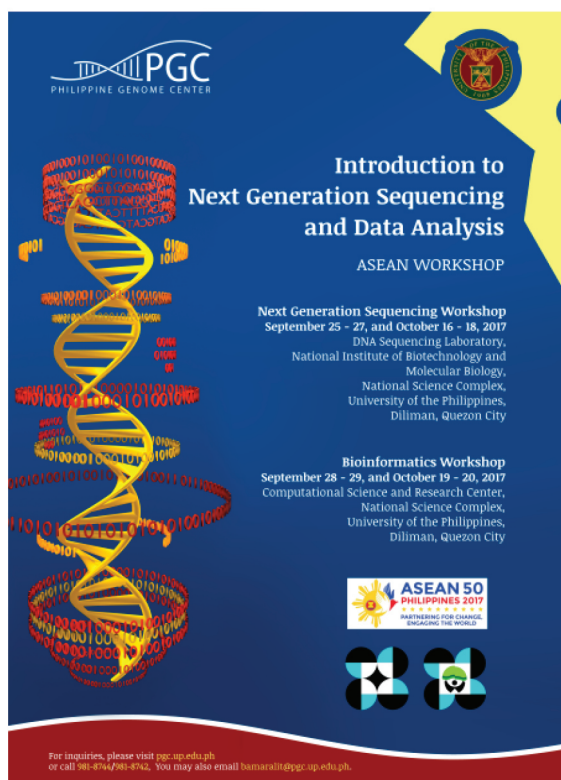


Photo from DOST-PCIEERD

ASEAN DECLARATION ON INNOVATION

We, the Heads of the Member States of the Association of Southeast Asian Nations (hereinafter referred to as “ASEAN”), namely Brunei Darussalam, the Kingdom of Cambodia, the Republic of Indonesia, the Lao People’s Democratic Republic, Malaysia, the Republic of the Union of Myanmar, the Republic of the Philippines, the Republic of Singapore, the Kingdom of Thailand, and the Socialist Republic of Vietnam, on the occasion of the 31st ASEAN Summit in the Philippines:

REAFFIRMING the importance of cooperation among ASEAN Member States (AMS) towards the formation of an ASEAN Community that is politically cohesive, economically integrated and socially responsible, as well as the development of human resources through closer cooperation in education and life-long learning, and in the creation of science, technology and innovation (STI) policies for people’s empowerment, inclusive growth, and strengthening of the ASEAN Community;

RECOGNISING the importance of Science, Technology and Innovation (STI) to foster sustainable economic growth, job creation,

and enhanced well-being and science and innovation systems, to spur creativity and innovation that will serve as a foundation in driving the growth and competitiveness of industries in the region;

COGNIZANT of the need for effective policies and laws that support a competitive, innovative and dynamic ASEAN;

ACKNOWLEDGING the principles adopted in the ASEAN Economic Community (AEC) Blueprint 2025 that provides broad directions through strategic measures for the AEC including the emphasis of STI as a driving force in the regional economic integration agenda;

WELCOMING the progress made in advancing STI under the ASEAN Plan of Action on Science, Technology and Innovation (APASTI) 2016- 2025;

MINDFUL of the changes in the ASEAN community as it becomes increasingly STI-enabled and therefore;

DECLARE that our states need policies that promote excellence and relevance in public research and encourage stronger links among government, academia, industry and society in order to strengthen the impact of STI, such as to:

1 **RECOGNIZE** the opportunities and benefits arising from innovative start-ups and disruptive technologies that enable transformation across sectors of society, thus requiring holistic policies that foster entrepreneurship and new business, facilitate movement of capital and talent and harness market scalability in the ASEAN region;

2 **PROMOTE** and reward innovative firms and businesses that generate employment opportunities by carrying out collaboration, capital investment, and cross-border transactions through digital technologies;

3 **STIMULATE** innovation literacy as well as the continuous development of Science, Technology, Engineering and Mathematics (STEM) and Information Communication Technology (ICT) generic, specialist and complementary skills, to equip the workforce with the skills and competencies for innovation through education and training policies attuned to the demands of our advancing economies;

- 4** **ENHANCE** the policy and regulatory environment for Micro, Small, and Medium-sized Enterprises (MSMEs), which promotes intra and inter-governmental cooperation and coordination mechanisms; involve MSMEs in the policy-making consultation process to enable better representation of their interests; provide support to micro enterprises in the informal sector and their integration; and streamline processes to set up business, to enable less costly and faster business formation, as well as processes and regulations that might limit firm growth or the exit of firms;
- 5** **HARNESS** STI to facilitate the realization of UN's Sustainable Development Goals by promoting further use of STI to address global challenges and societal concerns such as food security, health, energy, water, transport, environment, and disaster related problems, so as to improve the well-being of the ASEAN people in the urban and rural communities;
- 6** **FOSTER** a hospitable and dynamic intra-ASEAN policy environment for innovative research and technology transfer; and broaden supportive fiscal and non-fiscal policies for innovative R&D in both local and foreign owned firms in the region;
- 7** **ENCOURAGE** establishment of regional networks of joint research, capacity-building and innovation initiatives that focus on topics relevant to ASEAN, and enhance STI collaboration with global partners through such network organizations;
- 8** **PROMOTE** the use of the Intellectual Property Rights (IPR) system that facilitates research collaboration, technology commercialization and an innovation culture.

DIRECT all relevant ASEAN sectoral bodies to implement and review, as appropriate, the understanding that we have achieved in this Declaration so as to maintain its relevance to future challenges and opportunities confronting our economies and societies;

ENCOURAGE the relevant ASEAN bodies to promote and implement relevant policies and laws that support a pro-innovation, business and regulatory environment.

ADOPTED in Manila, Philippines on the day of Thirteenth of November in the Year Two Thousand Seventeen.

The ASEAN Declaration on Innovation, initially prepared by the Department of Science and Technology, was endorsed at the 17th ASEAN Ministerial Meeting on Science and Technology (AMMST-17) on 20 October 2017 and the ASEAN Economic Council, and adopted on 13 November 2017 by the ASEAN leaders on the 31st ASEAN Summit dubbed *ASEAN@50: Partnering for Change, Engaging the World*. The Declaration encompasses the guiding principles and strategies to strengthen the ASEAN innovation ecosystem.

S&T innovations in ASEAN traditional woven fabrics

By Rodolfo P. de Guzman, DOST-STII



Photo by Rodolfo de Guzman

The Sinh or Lao skirt represents the charm and elegance of Lao women while the T'nalak made of abaca fibers mirrors the intricate design and creative pattern formed out of dreams by the T'boli women weavers of Lake Sebu in Mindanao.

These unique and majestic fabrics were just a few of the many beautiful textiles showcased by the 10 ASEAN member nations during the 1st TELA ASEAN Textile Conference held 7-8 November 2017 at the SMX Convention Center, SM Aura, Bonifacio Global City, Taguig City. Other participants include Lao PDR, Cambodia, Indonesia, Malaysia, Myanmar, Singapore, Thailand, Vietnam, and the Philippines.

The conference dubbed "Weaves of Change, Fostering Ties that Bind" was organized by the Department of

Science and Technology-Philippine Textile Research Institute (DOST-PTRI) in collaboration with the ASEAN Foundation and the DOST-Philippine Council for Industry, Energy and Emerging Technology Research and Development (PCIEERD). TELA refers to the ongoing program of DOST-PTRI called "Textiles Empowering Lives Anew" that aims to infuse science and technology innovations to strengthen the Philippine textile industry.

"This conference is important to address common concerns among the ASEAN countries because clothing and textile are common denominators, and textile is a fusion of culture, tradition, and the arts," said DOST Secretary Fortunato T. de la Peña during his keynote address.

The science chief also stressed the need to marry technology and the creative arts to promote inclusive growth

and innovative capacity, and at the same time to understand the ASEAN, learning from the best practices, and addressing issues that affect the textile sector involving environmental security and sustainability.

"The TELA ASEAN Textile Conference is a first of its kind that coincides with PTRI's and ASEAN's 50th year anniversary, focusing on strengthening collaboration on textile research and technology, supporting the growth of the handloom weaving industry, and promoting the use of sustainable natural textile materials and natural dyes to achieve sustainable economic growth and meeting the demands of globalization," said Director Celia B. Elumba of DOST-PTRI.

The conference featured forums wherein each ASEAN country, except Brunei, presented the state of the textile

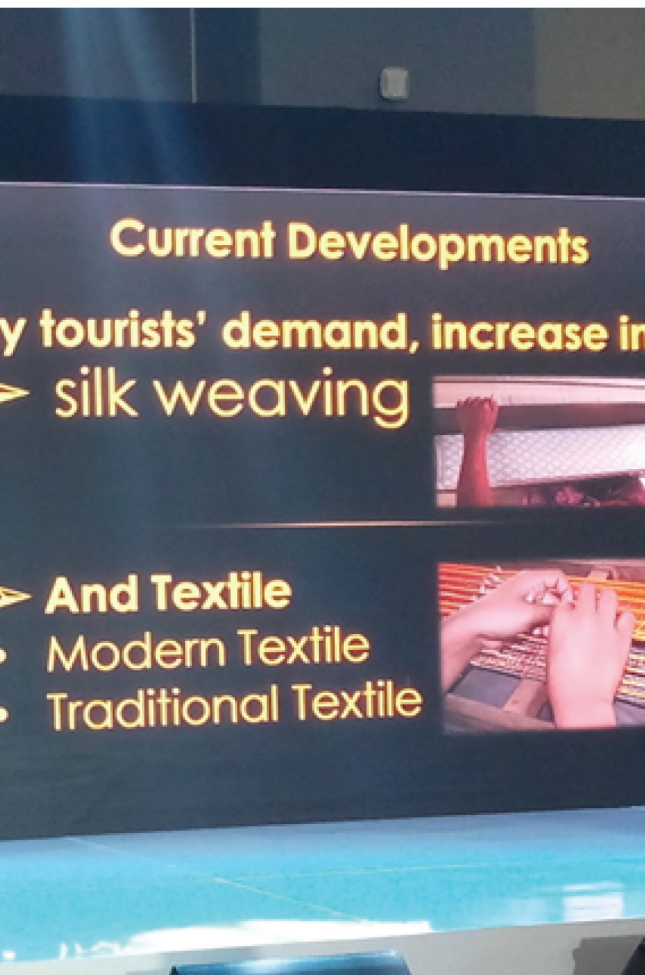


Photo by Rodolfo de Guzman



Photo by Rodolfo de Guzman

industry in their respective countries and the programs they are implementing to further develop handloom weaving and promote the use of natural dyes.

For one, Cambodia's Phon Sreyrath, general manager of Khmer Artisanry, discussed silk weaving incorporating traditional and ancient "ikat" technique using the flower and peacock patterns. "In Cambodia, we produce organic silk and naturally dyed products that help improve rural life by providing jobs for community workers, promote products made by disabled people, promote Khmer products in international markets, and inspire the young generation to keep dyeing alive and to preserve cultural pride," said Phon Sreyrath.

Meanwhile, Lao PDR's Kong Thong Nanthavongdouangsy, co-founder of the Phaeng Mai Gallery, discussed the

product policy they are implementing that harmonizes the environment and culture in their textiles. "In order to protect the environment, we, together with the weavers plant natural dye materials like almonds to produce brown-green color, ebony for grey color, and jackfruit wood and lac dye which is a mixture of sour fruit and sour leaves to produce bright red color," said Kong Thong.

Other speakers were Diana Jusuf of Torajamelo-Indonesia, Eric Ong of Society Atelier Sarawak-Malaysia, Phyu Ei Thein of Sunflowers Group Social Enterprise-Myanmar, To Hai Yen of Vietnam Rural Industries and Development Institute-Vietnam, Dr. Wiwat Hirunpruk of Thailand Textile Institute-Thailand, Dr. Nanci Takeyama of Nanyang Technological University-Singapore, and Jeannie Javelosa of ECHOstore Sustainable Lifestyle-Philippines.

As closing activity, a socio-cultural night featuring a gala fashion show was held after dinner where delegates and other stakeholders were treated with a colorful array of different apparels representing unique designs from each of the ASEAN member countries.

To wrap up the ASEAN event, the delegates had a half-day tour on 9 November of scenic and historical sites around the metropolis like Intramuros and later attended two DOST-PTRI sponsored workshops. The first one was on natural dye conducted by Ms. Kommaly Chanthavong from Lao PDR, a 2015 Ramon Magsaysay Awardee for Community Leadership. The other one was on Shibori dyeing, a Japanese method that uses a variety of ways of embellishing textiles or fabrics by shaping the cloth and securing it before dyeing with colors.



ASEAN collaboration on packaging technology development

By Rodolfo P. de Guzman, *DOST-STII*
Photos by Henry A. de Leon, *DOST-STII*

The importance of product packaging cannot be ignored because of the increasing market competition especially in the ASEAN region. The Department of Science and Technology (DOST) and its line agency, the Industrial Technology Development Institute (ITDI), have fully supported local initiatives to better improve packaging materials for Philippine made products.

"It is said that modern society is generally associated with packaging. I would say that packaging has a close connection with our society and economy; it always changes along

with transformations in society. Packaging is continuing to be given a greater role, whether in area of business or in bigger concerns like food security and environmental issues," said DOST Secretary Fortunato T. de la Peña in his keynote address during the ASEAN Packaging Conference.

For the first time, a conference of this for the ASEAN Summit was held on 26 October 2017 at the Sofitel Philippine Plaza Manila in Pasay City, marking the 50th year anniversary of the organization where the Philippines is a founding member along with Thailand, Malaysia, Indonesia, and Singapore. This is one of the three events under the DOST supported

by the ASEAN National Organizing Council and co-organized with the Packaging Institute of the Philippines.

The conference served as a good venue to discuss possible collaboration among the 10 ASEAN member countries and explore cooperation in common areas of development, such as 1) conducting packaging research and development, 2) addressing packaging regulations that hamper the competitiveness of ASEAN products, and 3) developing packaging standards that would benefit the ASEAN countries economically and socially.

"We all know that packaging is science

and technology based, thus scientific and technological innovations are the main components in making ASEAN packaged products at par, if not better, with those from industrialized countries,” Sec. de la Peña added.

The science chief cited examples of Philippine packaging innovations like the invention of the sachet or the single serve products like shampoo, and coffee. Such packaging is not only for convenience in handling but also for making the products more affordable to the consumers. He believes that this will be the trend in all ASEAN countries.

Aside from the technological expertise of scientists and innovators in the ASEAN region, Sec. de la Peña said that human capital is crucial to developing cutting-edge packaging technologies that will address

the demand of consumers in the region. This can be supported by strengthening the research and development agenda of each member country through collaboration and exchange of ideas.

“I believe we have world class designers in ASEAN. Look at our products in the supermarkets, duty free shops, and anywhere else in the world, ASEAN products are very competitive in terms of package design. Technological development in printing is so fast with digital printing technology and now we are in the age of 3D printing,” stressed Sec. de la Peña.

Sec. de la Peña underscored the importance of regional cooperation. He, likewise, extended his gratitude to the governments of Japan and South Korea, both members of the ASEAN Plus 3, for helping the ASEAN member states

in developing capabilities on packaging technology and engineering. Such development is achieved through technical cooperation projects and through the ASEAN member-states’ packaging research institutions.

“In the next 10 to 20 years there will be huge demands for packaging that provide adequate protection and preservation of natural and manufactured products. The urgency of fast packaging technology development is needed for us to catch up with the growing population in ASEAN; making products [especially food products] available and affordable to as many people as possible will be vital in perking up economic growth and uplifting our quality of life,” Sec. de la Peña concluded.



On the pipeline: **ASEAN-COST projects for entrepreneurs and materials science experts**



The ASEAN-Committee on Science and Technology (COST) on its 73rd meeting approved two projects proposed by the Philippines under ASTIF. Each project costs US\$50,000.

The project "Regional Workshop on Low Carbon Technologies for MSMEs in the ASEAN" intends to strengthen capacity and improve competitiveness of ASEAN MSMEs and reduce emissions through low carbon technologies. The workshop will serve as a regional platform for discussing best practices and technologies, and develop

replicability strategies, for energy efficiency and sustainable technology interventions among entrepreneurs in the region.

During the workshop, best practices that promote voluntary adoption and diffusion of low carbon technologies shall be identified. Subsequently, policies that support development and use of identified best practices among ASEAN MSMEs shall be formulated.

The workshop will likewise be the venue in establishing a voluntary data sharing platform of ASEAN entrepreneurs' innovative best practices on low carbon technologies. To be also introduced during

the workshop is the concept of carbon footprint labeling for MSMEs products in the region.

Meanwhile, the project Training on Advanced materials Characterization Techniques for Young Researchers from ASEAN Member Countries (SCMST) will help facilitate the identification of academic institutions, including research institutes/centers and laboratories, that will provide training in materials science and engineering.

This proposed training will be held in three ASEAN Member states, namely the Philippines, Singapore and Thailand. All ASEAN Member states will send their respective participants for the said training.

The training intends to upgrade capacities of participants, narrow the gaps, and make everyone at par with their

counterparts in other ASEAN member states, particularly in the electronic sector which is one of the priority integration sectors identified by ASEAN.

The training will consist of lectures on the basic principles of each technique and hands-on workshop on the following equipment: auger electron spectroscopy, time of flight secondary ion mass spectroscopy, high resolution transmission electron microscope, field emission scanning electron microscopy, electron probe X-ray micro analyzer, and X-ray photoelectron spectroscopy.

Participants should have a BS degree in Physics, Chemistry, Materials Science & Engineering, Metallurgy, Chemical Engineering, and related fields. *(By Framelia V. Anonas | Photos by Henry A. de Leon, DOST-STII).*

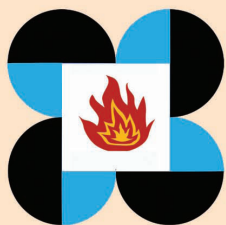
PH to host 2018 ASEAN events

The Philippines, through the DOST, will host the following annual activities:

- ASEAN Sub-Committee on Marine Science and Technology (SCMSAT) Meeting in April 2018
- 5th ASEAN-Japan Workshop (STSForum)
- 75th Meeting of the ASEAN Committee on Science and Technology (COST-75) in October 2018
- 10th Informal AMMST in October 2018

The following events will be hosted in parallel to COST 75 and IAMMST-10 which will be led by different AMS:

- Young Leaders Forum
- ASEAN Technology Transfer Forum
- IP Meeting/Workshop
- Health-related, Open Innovation and Entrepreneurship Platform
- Startup Innovation
- Public-Private-Partnership- People (P4) Forum



PHILIPPINE SCIENCE HIGH SCHOOL SYSTEM

Awards

MAIN CAMPUS (MC)



Gold

**Malaysia International
Young Inventors Olympiad**
1-3 April 2017, Malaysia

Lisa Jovellanos
Samantha Nicole Gaw



Most Innovative Research Project

International Student Science Fair
19-23 June 2017,
Korea Science Academy

Philippe Bungabong



First Place Research Presentation

STEP NUS Brain Camp
1-3 April 2017, Malaysia

Nathaniel Arvin Avila, Jean Ray
Dominic Dela Pena, Djuliana
Impreio and Kevin Kiunisala



Silver

Taiwan International Science Fair
5-11 February 2017, Taipei, Taiwan
(National Taiwan Science Center)

Joshua Kyle Sun-Myung C. Kim

ILOCOS REGION CAMPUS (IRC)



Silver and Bronze

**Malaysia International
Young Inventors Olympiad**
14-17 April 2017, Malaysia

Scholars (Silver Awards):
Eulogio Clarence Martin L. De
Guzman IV, Michael Merrit, Patrick
Joseph A. Samson, Aldous Leo V.
De Las Llagas, Leonel Pelayo and
Gerald Marco Valledor

Scholars (Bronze Awards):
Rhaena Ellyse A. Pablo, Melanie De
Guzman, Domnina Nicolas, Jewel
Rhianne I. Pasion, Czarelle Calautit,
Aubrey Bumanglag, Joshua T. De
Guzman, Rolly Jhan N. Maturan and
Elymie Nathaniel Pulido



Most Innovative Research Project

**Sri Aman International
Environmental and
Youth Leadership Summit**
April 2017, Malaysia

Scholars (Silver Awards):
Vincent LT L. Pataray and
Izel Praise A. Fernandez
(Gold - Creative English Poetry
Competition)

Amazing Eco Race:
1st Place: Vincent LT T. Pataray
4th Place: Gwyneth Cecille T. Soliven
4th Place: Randolph Cedric L. Chan
6th Place: Izel Praise A. Fernandez

BICOL REGION CAMPUS (BRC)



Gold and Special Awards

**World Invention Innovation
Contest 2017**

5-6 June 2017, South Korea

Gold & AICA Special Award
Nicole Kaye R. Calara
Sofia Mae V. Guadalupe
Kaira Danielle E. Lubis

Gold & Korea Invention News
Special Award
Maria Yzabelle Angel V. Palma,
Dominic P. Casio,
Julius Caesar M. Damo III,
Martin Judd B. Puerto

(Gold & Euro and Rif-Romania
Special Awards)
Jo Stephanie I. Ribaya
Marcia Clarice H. Rocha
Ma. Lourdes Josefa O. Guerrero

Gold & KIA [Korea Invention Academy
Special Award
Renee Marianne P. Bajamunde
Frances Dominique O. Caparanga
Jhetro V. Villafuerte

Gold & Asia Invention Association
Special Award
Bruce Brandon C. Imperial
Hannah Fenina Estrella
Ceejay Z. Regala

SOUTHERN MINDANAO CAMPUS (SMC)



**Gold and
Silver**

Malaysia International Young Inventors Olympiad

14-17 April 2017, Malaysia

Rojenn Claire Patigdas (Gold),
Krizzia Erika B. Barez (Gold),
Pauline Shean L. Garcia (Gold),
Klarisse A. Cruzado (Gold),
Francis Elisha U. Divinagracia (Gold),
Lorems Yrol Pedeglorio (Silver)



SOCCSKSARGEN CAMPUS (SC)



Bronze

2017 International Mathematics Wizard Challenge

19-23 May 2017, China

Kristen Pauline Gador
Marc Joshua Ayalde



CENTRAL LUZON CAMPUS (CLC)



Rank 3

International Physics Olympiad 2017 National Elimination

27 May 2017, Philippines

Charles Jerome Bartolo

Participants



Sakura Exchange Program PSMS scholars in Japan-Asia Youth Exchange Program

This year, 15 PSMS scholars were sent to Japan to participate in the Sakura Exchange Program, held on 14-20 May 2017. The PSMS Sys-tem sends scholars to this program every year to engage the scholars in the world-class technology of Japan.

Yzan Paolo Cadigoy, MC
Eljiamin Claveria, MC
Rafael Santiago, MC

Nico Catindig, MC
Marla Via Abao, MC
Clint Eldrick Petilla, SMC

Pia Junea Nebrada, SMC
Felix Suarez, WVC
Rajo Christian Cadorna, WVC

Justin Che Romero, BRC
Jan Francis Severo, BRC
James Gabriel Casia, CVC

Maria Kizha Espejo, IRC
Marvin Jericho Cava, IRC
Chezka Marina Hufano, CARC

WESTERN VISAYAS CAMPUS (WVS)



**Best in Presentation &
Best Innovation Award**

2017 Asia Pacific Forum for Science Talented

1-6 July 2017, China (Taiwan)

Danielle Anleigh Colacion
Reigen Placido
Justin Rey Secondes



**Silver, Best Poster
& Best Presentation**

2017 Super Science High School Student Fair

9-10 August 2017, Kobe, Japan

Luis Alfonso Pefianco
Kim Dale Dogeno
Gian Francesco Gamboa



Various Awards

Sri Aman Environmental Youth Leadership Summit 2017

16-21 April 2017, Malaysia

1st Place Eco Challenge:
Mica Antonia Jaen
2nd Place Eco Challenge:
Jose Gabriel Javellana,
3rd Place Smart City Competition:
Mica Antonia Jaen and Luke Socrates
Mica Antonia Jaen, Jose Gabriel Javellana,
Luke Socrates, and Christine Miraflores

Scholars (Silver Awards):
Vincent LT L. Pataray

(Gold - Creative English
Poetry Competition)
Izel Praise A. Fernandez

Amazing Eco Race:
1st Place: Vincent LT T. Pataray
4th Place: Gwyneth Cecille T. Soliven
4th Place: Randolph Cedric L. Chan
6th Place: Izel Praise A. Fernandez



**Best Speaker &
Team of the Year**

Global Youth Leaders Travel and Learning Camp 2017

3-7 August 2017, Singapore

Best Speaker
Mary Emmanuelle Castaneda

Participant
Adrienne Martha Barrientos

Team of the Year
Mary Emmanuelle Castaneda's Group



Participants

1st International RMA Young Scientists Conference & Exhibition

10-16 July 2017, Malaysia

Josh Thomas Clement
Ryan Izach Josue
Kyle Jeremiah Ledesma



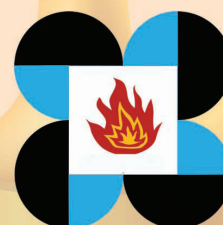
**Most Innovative
Research Project**

International Student Science Fair

19-23 June 2017,
Korea Science Academy

Philippe Bungabong

Congratulations to all awardees!





BRC Scholars for Global Excellence

GOLD

13th International Mathematics Contest
(Singapore) 2017

August 2017 in Singapore

John Angelo Oringo

4th International Young Inventors Award 2017
22-24 September 2017 in Indonesia

**Faye Espalmado
Zhavie Isabel Mago
Martina Joanna Manuel**

SILVER

11th International Earth Science
Olympiad, 22-29 August 2017
in France

Eugene Toribio

13th International Mathematics
Contest (Singapore) 2017
August 2017 in Singapore

Adrian Richard Salazar

4th International Young
Inventors Award 2017
22-24 September 2017 in
Indonesia

**Angel Palma
Sofia Mae Guadalupe
Marianne Dominique Nueva
Sheila Mae Tan**

BRONZE

13th International Mathematics
Contest (Singapore) 2017
August 2017 in Singapore

Jose Carlo Salazar

GOLD & SILVER

1st Royal Military College
Young Scientists Contest and Exhibit (I-Rysce)
5-10 July 2017 in Malaysia

**Elijah Hames Cal Ortiz (Gold)
Maria Angel Yzabell Palma (Silver)
Justine Che Romero (Silver)**

FINALIST

Young Inventor's Challenge
2017 Grand Finale
30 September 2017 in Malaysia

**Emie Jenelle Asanza
Ma. Louella Mayumi Caparoso
Kristine Angel Cerillo
Joseph Andrew Mendoza**

EAT YOUR HEART OUT

Saturated fats aren't as bad as you think

By Allyster A. Endozo, *Philippine Journal of Science, DOST-STII*

For years, conventional knowledge has instinctively compelled health buffs and weight watchers to think that saturated fats should be avoided. They purportedly haul a ton of harmful consequences to the human body, with cardiovascular diseases (CVD) and obesity being consistently cited as the most fearsome of all.

But nothing could be further from the truth according to Dr. Fabian M. Dayrit, a phytochemistry expert from Ateneo de Manila University and chair of the Scientific Advisory Committee for Health of the Asian and Pacific Coconut Community (APCC).

In his paper entitled "The Dietary Guidelines and Its Implications for Coconut Oil," Dayrit explained that modern misconceptions about saturated fats (coconut

oil in particular) are rooted on faulty research findings of the past, particularly those that were authored by Ancel Benjamin Keys.

"[He] was a very active and very influential physiologist-diet scientist whose career spanned over six decades, from the 1930s to the 1990s. He was a very prolific researcher, but was very aggressive with his ideas, to a fault," Dayrit said.

Keys' clout in the nutritional science arena extended even further with the 1986 publication of his "Seven Countries Study" which involved over 12,000 healthy men aged 40-59 years from Finland, Greece, Italy, Japan, the Netherlands, the United States, and Yugoslavia. The 15-year study highlighted a positive relation of death rate among subjects with regular consumption of animal fats, which are long-chain fats, unlike coconut oil which mostly contains medium-chain fatty acids.

In 1988, Keys formalized his hypothesis that the risk of coronary heart disease stemming from atherosclerosis is aggravated by high serum cholesterol caused by dietary saturated fats and cholesterol.

The hypothesis has already been disputed by a number of counter findings during the late 1950s and mid-1960s, and by actual case studies among people in developing nations. In spite of virtually zero sugar consumption and heavy fat intake from meat and milk, cardiac ischemia among the Samburu and the Masai tribes in East Africa had been observed to be rare in a 1965 study. Additionally, case studies among communities in Pukapuka and Tokelau in Polynesia (1981) and the Philippines (1987) has already disproven the widespread conjecture that saturated fats like coconut oil cause CVD.

Decades of scientific misrepresentation have managed to stamp a profound stigma on saturated fats, particularly on coconut oil.



Health risks vary

Soybean oil, which mostly contains polyunsaturated fatty acids, has been increasingly edging saturated fats away from the limelight of critics for its more lethal health effects. In 2009, experts demonstrated its tendency to raise LDL (low density lipoprotein cholesterol or bad cholesterol) and HDL (high density lipoprotein cholesterol or good cholesterol) ratio and total cholesterol despite curbing abdominal obesity, unlike coconut oil, which effectively contained all major parameters. In 2015, researchers established its propensity to dysregulate mouse genes involved in cancer, diabetes, inflammation, obesity, liver, and mitochondrial functions (unlike coconut oil).

High-fructose corn syrup (HFCS) has likewise been under the probe of nutrition experts for its detrimental impact, as diabetes was found to be 20 percent more prevalent in nations where HFCS is readily available. Some of its physiological effects include decreased glucose tolerance and increased levels of insulin, uric acid, and VLDL (very low density lipoprotein) cholesterol. Even more serious is HFCS's ability to form advanced glycation

end-products (AGEs) that can severely hinder or even block enzyme and receptor reactions, thus establishing its causative link with metabolic disorders such as Alzheimer's disease, diabetes, and CVD.

Further still, regular meat consumption also warrants great caution for a number of health risks, particularly when fried in polyunsaturated oil. These include atherosclerosis due to increased levels of oxidized cholesterol and trimethylamine oxide, as well as biomolecular disruption stemming from the formation of AGEs and free radicals.

In 2003, the World Health Organization reported that Pacific Islanders risk greater chance of developing diabetes (2.4 times) and obesity (2.2 times) if imported calorie sources (e.g., butter, canned meat, sweets) replace traditional sources (e.g., coconut, fish, pork).

With this statement, Dr. Dayrit concurs, "Foods which are high in refined sugar, HFCS, and readily digestible carbohydrates are major contributors to obesity. Unfortunately, modern lifestyle – which is less active and more sedentary – leads to excess calorie consumption and poorer overall health."

Implications for the country's coconut industry

Clearly, decades of scientific misrepresentation have managed to stamp a profound stigma on saturated fats, particularly on coconut oil. The subsequent spread of erroneous dietary facts has burdened the public with tremendous social cost that would take generations to upend.

"It's important to emphasize that the government has to be more proactive with its support of the coconut industry. For example, we have PhilRice as a rice research institute, but we do not have a coconut research institute. Note that the Philippine Coconut Authority is an administrative unit, not a research institute," said Dayrit.

For Dayrit, government interventions in the form of public information and research drives, child feeding programs, public-private partnerships, and transnational outreach could decisively aid the coconut sector in rehabilitating its besmirched stature. This is especially true for the Philippines, a member of the APCC that represents over 500 million coconut consumers across the region.



AGAPAY ALILEM

*Community empowered
through S&T*

By Flordeliza L. Alida, DOST-I

Photo by DOST-I

Through Department of Science and Technology's (DOST) community empowerment program, farmers and fisherfolks in Barangay Apang, Alilem, Ilocos Sur were able to find alternative income. Dubbed as the "poorest of the poor" in most surveys, farmers and fisherfolks in this barangay now have the time and resources to make each day economically productive. Rural communities where most farmers and fisherfolks live abound with many resources for industrial, medical, food production, and other applications, that could be developed as additional sources of income for the community. One of these communities is Barangay Apang in Alilem, Ilocos Sur, assisted by the DOST through the Community Empowerment through Science and Technology (DOST-CEST) program. One of these communities is Barangay Apang in Alilem, Ilocos Sur, assisted by the DOST through the Community Empowerment through Science and Technology (DOST-CEST) program. DOST-I calls the project "Agapay (Support) Alilem."

Folks in Barangay Apang mainly thrive on planting rice but most of them prefer to keep their harvest for the family rather than sell it in the market. With this, they earn from selling fruits and other vegetables in nearby markets or stores to be able to buy other goods. Among the products they sell are banana, banana blossom, bamboo shoot, and others.

Enabling grassroots

In 2013, DOST-I, the Ilocos Sur Polytechnic State College (ISPC), and the municipalities of Alilem and Sugpon, both in the province of Ilocos Sur, signed a memorandum of agreement for the implementation of DOST's CEST program. Among the areas for science and technology interventions are on livelihood and enterprise development through on-site trainings and assistance. Barangays Apang, Kiat, and Danac in Alilem town, and Barangay Pangotan in Sugpon town, participated in said trainings.

From being mere suppliers of resources, the communities were trained on good agricultural practices for ginger; processing ginger into instant tea and powder; and processing banana into vinegar, powder, polvoron, chips, and cookies. Moreover, Barangay Kiat also went on training for bamboo bleaching, dyeing, and handicraft making.

Further, 18 elementary and high school teachers went on computer skills training

to enhance basic education and literacy. Elementary schools in Barangays Licungan, Danac, Calipayan, Apang, and Kiat received modern educational equipment while Alilem National High School and Sugpon LGU received computer sets installed with Super STARBOOKS (Science & Technology Academic and Research-Based Openly Operated Kiosk Station).

"Unang-una, nagpapasalamat po kami sa tulong na ibinigay ng DOST-I sa aming school. Mayroong computer at modules na ibinigay para makatulong na mapadali ang teaching at learning process dito sa aming school," said Thelma Palma, officer-in-charge and teacher of Apang Elementary School. (First of all, we thank DOST-I for the help extended to our school. Now, we have computers and modules to help facilitate teaching and learning process here in our school).

Moreover, DOST-I also implemented the project "Disinfecting Aqua's Noxious and Unwanted Microorganisms (DANUM) toward Safer Drinking Water for Communities." Among the interventions for this campaign

included water sampling and potability testing on springs and deep wells of Barangays Apang, Kiat, and Pangotan in Sugpon. Technologies such as the candle-type Ceramic Water Filter and hyposol solution were provided to households, daycare centers, and barangay health centers to ensure safe drinking water.

One of the priorities too was reducing malnutrition through DOST PINOY (Package for the Improvement of Nutritional Status of Young Children). Through this project, the regional office calibrated weighing scales and trained barangay health workers and mothers with the launch of the 120-day complementary food feeding program to 147 undernourished kids.

Ellena Leo Licwasen, barangay health worker, also recalled that children in their barangay were not given enough attention in terms of health, resulting in increased malnutrition cases. She thanked the DOST for the first phase of the 120-day complementary food feeding program to children aged six years and below conducted in their barangay.





Opportunities in the grassroots

Conducting S&T interventions such as trainings and seminars are among the significant activities that educate and create awareness in the grassroots. In Barangay Apang, folks sold ginger, turmeric, and bananas in nearby towns and cities. Upon learning how to process these resources into products, barangay farmers organized the Apang Farmer's Association led by Efren Cubalit. The association was organized to produce turmeric tea and banana chips applying proper health safety procedures. The association is composed of 30 members from the different sitios of Apang, mostly women.

The continuous assistance of DOST enabled the association to produce more than 100 packs of 10-gram banana chip pouch and more than 60 packs of turmeric tea a day. These products are being sold to nearby stores, schools, and municipalities. This proves that the people are now producers, rather than mere suppliers, of raw materials for turmeric tea and banana chips.

"Agyaman kami iti suporta nga inted ti DOST-CEST kas koma iti insuro da nga panagluto ti banana chips, turmeric tea, ken daduma pay nga livelihood programs," said Cubalit. (We thank the DOST for its support through CEST especially in teaching us how to make banana chips and turmeric tea and training us in other livelihood programs.)

Cubalit admitted that processing was previously very difficult as they did things manually due to lack of funds for equipment. This resulted in low output for the association. Cubalit and his members did not lose hope; rather, he requested DOST and other agencies for continuous support especially in providing equipment for the association to have higher productivity and success.

The members of Apang Farmer's Association also expressed

their support for the program. According to them, they no longer sell bananas and ginger cheaply as they now have more gains by processing their products.

Meanwhile, Hon. Mar Ruel P. Sumabat, mayor of Alilem, Ilocos Sur, also extended his support and appreciation to the DOST-CEST intervention. "You really made life a little easier for us. You gave us an inspiration and you gave us this living hope to go on and to improve on the program that you started," said Mayor Sumabat. "We lack funds but because of your innovative interventions, nakikita po namin yung progreso, nakikita po namin na makakawala po sila sa tanikala ng kahirapan." (We see improvements and we know that they will be freed from the chains of poverty.)

He also explained that it is important to learn first the technical know-how in starting a business among individuals or associations to make a business successful.

Dr. Armando Q. Ganal, regional director of DOST-I, thanked the ISPSC and local government units for their commitment and support during the implementation of S&T interventions. He further encouraged the municipalities of Alilem and Sugpon in Ilocos Sur to create the Municipal Science and Technology Coordinating Council to further strengthen and implement S&T programs in the community.

From the experience of Alilem, strengthening partnerships between government and non-government agencies to empower the grassroots, and providing people with skills to harness their resources, will lead to economically productive and healthy communities.





Born dedicated

By Flordeliza L. Alida, DOST-I
Photo by DOST-I

I have pledged myself to teach students in the future, and I want to be a factor in people's upbringing, especially in their academic life," says Jeric Aren Ordoñez Dedicatoria, a Department of Science and Technology (DOST) scholar-graduate of Bachelor of Secondary Education major in Mathematics, magna cum laude, in 2016 from the Ilocos Sur Polytechnic State College (ISPSC) in Sta. Maria, Ilocos Sur.

Dedicatoria is among the first batch of DOST scholar-graduates under RA 10612 who were mandated to teach full time high school subjects in a secondary public or private school for two years. This type of scholarship aims to strengthen science and technology education by fast-tracking graduates in the sciences, mathematics, and engineering.

The DOST scholar as awardee

Jeric hails from Bateria, San Esteban, Ilocos Sur and is passionate, dedicated, and determined towards his goals as can be seen in his academic and extracurricular achievements.

Aside from having received the highest honors in his class, he also bagged medals recognizing his excellence in the academe such as the ISPSC Medallion Award, Gov. Ryan Singson Academic Excellence Award, Cong. Eric Singson Leadership Award, Best Undergraduate Research Award, DOST Academic Excellence Award, Student Writer of the Year, and Journalist of the Year.

"Being an academic awardee has never been my goal, it's just a freebie of what I have learned in school. Well, maybe the most important thing that I may have realized in achieving a certain recognition is 'not taking it too seriously.' I believe that I can do my best even though I don't have to be too serious. Also, maybe I have believed that 'too much' is lethal in achieving goals," said Dedicatoria.

From tin to gold: Recapturing the story of the Ilocos Superkalan inventor

By Flordeliza L. Alida, DOST-I
Photo by DOST-I



Q: Who was the first person to land on the moon?

A: Neil Armstrong.

Q: Who invented the telescope?

A: Galileo Galilei.

Q: Who invented the kalan (local stove)?

...

We can confidently answer the first three questions but the last question makes us dumb because we don't actually know the people behind the small technologies we use in our daily living.

In the Ilocos Region, we have the Superkalan which comes very useful when our gas stove runs out of fuel. The inventor of this wonder kitchen tool is Narciso P. Mosuela, a man who dresses simply and borders on the talkative but speaks with so much sense. When he speaks, he has the tendency to go around the bush but all he wants is to encourage and inspire others.

Mosuela is a multi-awarded farmer and inventor from Bangar, La Union. He became popular in the region for his Superkalan which is sold locally and abroad.

Tracing the path of a multi-awarded farmer

Mosuela resorted to farming when his parents could no longer afford his studies and he had to drop out when he was in first year high school. Since then, he spent his life in the rice fields until he married and was blessed with four children. However, he realized that his income from the farm alone was not enough to cover the needs of the family.

He then decided to go to Manila where he was employed as an automotive electrician in a franchised Ford dealer company. In the said company, he worked with dedication and patience. A Tagalog quote says, "Pag may tiyaga, may nilaga (Patience will bear good result)." Mosuela's hardwork paid off when he was transferred to the engineering department of the company where he honed his engineering skills for eight years.

While working, he took all the opportunities to discover and learn

the techniques in manufacturing metals. Thus, he was able to start inventing his own Superkalan and thresher that led him to put up his Natomo Enterprises.

The Superkalan, known as the Natomo Superkalan in the market, is an energy-saving cooking tool designed to use wood, paper, sawdust, and other locally available and inexpensive fuel.

From “Super Kalawang” to Superkalan

In the world of invention, the first output is not the final. According to Mosuela, he experienced difficulty in marketing his first Superkalan. It was first made of tin and his customers complained because the product got rusty when washed with water. It was then dubbed “Super Kalawang” because of the rust in his Superkalan.

“Mahirap ang Superkalan, kung iniisip ko ngayon parang hindi ko kayang gawin. Nagsimula sa lata tapos ipinagbili ng ipinagbili, pero noong balikan ko ang mga bumili ang tawag sa akin ‘super kalawang.’ Ang problema kung hinuhugasan, laging kinakalawang,” said Mosuela.

(Creating Superkalan is difficult. I thought I will not be able to do it. I started with tin which I was able to sell. But the buyers called it “super rust” because it got rusty when washed with water.)

Despite the problems and criticisms from other people, Mosuela did not dump his invention in a corner. Instead, he got more encouraged to

find ways to improve his kalan. He then decided to try aluminum alloy metal which he found successful.

“Wala na talagang ibang paraan kundi gawing aluminum yan, diyan ako nahirapan kasi kung saan-saan ako nagpunta,” he added. (There was no other way but to use aluminum. It was hard for me because I went everywhere [just to validate it]).

Financial difficulty hindered Mosuela from reproducing his invention. Thus, Natomo Enterprises availed of the Department of Science and Technology-Small Enterprise Technology Upgrading Program (DOST-SETUP) and was granted support in 2008. With this, the firm was able to acquire upgraded machines and he was able to manufacture more Superkalan units.

“Natawa sa akin ang tao noon pero sa awa ng Diyos, natapos ko yung kalan. Gumanda ito hanggang sa naki-exhibit ako sa Maynila na sponsored ng DOST. Tapos, akalain mo, napili yung kalan ko na pinakamagandang exhibit. Nagkaroon ako ng plake. Sunod-sunod na ang aking award kasi pinaganda ko ng pinaganda,” stressed Mosuela.

(People at first laughed at me but in God’s mercy, I was able to fine-tune the stove. Then I joined a DOST-sponsored exhibit in Manila where my product was chosen as the best exhibit. I was awarded a plaque for it then more awards came after the improvements I made on the product.)





Imagination is the limit Unique designs from scrap

By Maria Luisa S. Lumioan, DOST-Abra

Photos by DOST-Abra

Double zero waste campaign by Department of Science and Technology-Cordillera Administrative Region (DOST-CAR) among furniture industry players in Abra resulted in unique products and competitive firms while keeping the environment clean.

Producers can use left-over materials from production and turn them into something useful. This piece of advice from Forester (For.) Moreno L. Santander, Jr. inspired Abra furniture makers to explore their imagination to come up with unique and creative products.

The furniture makers were participants to a series of trainings for Abra-based furniture producers organized by the DOST-CAR thru its provincial office in Abra in partnership with DOST-Forest Products Research and Development Institute (FPRDI).

Santander, science research specialist of DOST-FPRDI, was one of the resource persons in said training series that focused on mixed media furniture, resin lamination, and upholstery. He underscored that one of the main advantages of mixed media design is that production scraps can be turned into something useful.

In furniture making, mixed media pertains to the use of different raw materials like wood, metal, bamboo, rattan, and others in a single product.

Raw material combinations for unique designs

Santander added that furniture makers can create distinct products from their own designs and native raw material combinations to set them apart from other companies. Likewise, furniture makers can take advantage of raw materials to create designs that would be difficult for others to copy.

For. Santander also emphasized that product development should be an integral part of a company's activities. He added that developing forest products is a continuous process that involves research of possible

materials and their characteristics, concept generation or visualizing and sketching possible designs, and evaluation of the components of the product.

For. Aralyn L. Quintos, senior science research specialist also at DOST-FPRDI, discussed wood finishing techniques and remedial measures on finishing problems.

Science Research Analyst Eduardo M. Atienza, meanwhile, gave DOST-FPRDI recommended procedures in finishing. Participants also had the chance to work on actual mixed media designs provided by DOST-FPRDI under the guidance of Fernando M. Pesigan, science aide of the same institution.

Hands-on training

In addition to mixed media design and wood finishing techniques, DOST-FPRDI also provided the participants hands-on training on resin casting/lamination.



Resin is a highly viscous substance that can be extracted from plants or can be synthetically produced. In resin casting or lamination, synthetic resin and other materials such as scrap wood, shells, leaves, etc. are put into a desired mold and allowed to harden. Products that can be made through this process include accessories, drawer handles, and decorations, among others.

“Imagination is the limit in creating resin laminated products,” said Quintos.

The five-day training was held on 7-11 November 2017 at DOST-Abra and Balbin's Furniture in Bangued, Abra. The training aims to keep local furniture makers competitive in the market. It is one of the programs of PSTC-Abra that support local micro, small, and medium enterprises through the sharing of DOST technologies.

Furniture making is one of the thriving industries in the province because of the availability of raw materials for furniture.

Challenges in furniture making industry

However, recent restrictions on the harvest and use of certain hardwoods have posed some challenges to the local furniture industry.

“There is a need to expand the raw material base in furniture production so that local producers can remain competitive,” explained Menandro B. Buenafe, provincial director of DOST-Abra.

Buenafe further said that this training can also help the local furniture makers minimize waste by giving them ideas on how to transform scraps into useful materials.

Zero waste company in Abra

“Here in Abra for example, Balbin's Furniture, one of our cooperators for Small Enterprises Technology Upgrading Program, is already practicing zero waste in its production process,” Buenafe said.

Balbin's Furniture turns scraps of woods, bamboo, wood shavings, and even saw dust



into high value by-products. Trimmings are usually used as fuel for the lumber kiln dryer and the excess are mixed with saw dust to turn into charcoal briquettes. The process of making charcoal briquettes also produces another by-product, liquid smoke, which can be used as deodorizer, disinfectant, and insect repellent.

As a breakthrough in recent years, DOST-FPRDI experts introduced another way of using waste materials by turning scrap wood,

bamboo, and saw dust into mosaic accents in furniture. Balbin's Furniture adopted this method and began creating furniture with mosaic accents. These products found their way in big markets after being exhibited in the SM Mall of Asia during one of the National Science and Technology Week events, a yearly activity organized by DOST to promote science and technology in the country.



Of pitcher plants and tribal wars

By David Matthew C. Gopilan, DOST-STII



ONLY IN THE PHILIPPINES *Nepenthes malimumuensis* (left) and *Nepenthes manobo* (right) represent the 50 *Nepenthes* species of the country. Photo courtesy of Adeline Calaguian and N. Lagunday.

Tribal wars in the mountains won't stop a group of botanists from finding new species of pitcher plants.

Botanists Noel Lagunday, Dr. Florfe Acma, Dr. Veneracion G. Cabana, Novo M. Sabas, and Dr. Victor Amoroso reported two new pitcher plants in Mt. Pantaron Mountain Range in Bukidnon, Mindanao. They named the first plant as *Nepenthes malimumuensis* to denote its

discovery in Mt. Malimumu, and *Nepenthes manobo* to honor the Manobo tribe who has the ancestral territory in the area. Their paper appeared on the June 2017 issue of the Philippine Journal of Science (PJS).

Lagunday described the Manobo Matig-Langilan tribe as the “fiercest” in the province. “They practice *magahat* or tribal war which totally changes the safety conditions when working in the area,” Lagunday said in an email interview.

He also added that there are bandits and rebels in the area, as well as cross fires between the Philippine army and rebel groups, thus making the Mt. Pantaron Mountain Range partly explored. “We cross paths with them but we introduce ourselves as friends, and not enemies,” Lagunday said.

Carnivorous, detritivorous, mutualist

Nepenthes is a group of plants that have pitcher-shaped leaves that can lure and catch frogs, rats, and insects. At the bottom of these pitchers are liquid enzymes that can slowly digest the caught victim, giving much-needed nutrients to the plants. Research suggests that some members of *Nepenthes* plants have mutual relationship with mountain shrew rats. A *Nepenthes* pitcher plant from Borneo secretes sugary nectar, an important food source for the mountain shrew rat. The rat then poops on the pitcher, giving nutrients such as nitrogen to the plant. Other *Nepenthes* plants absorb extra nutrients from forest detritus like leaves that fall on the pitchers.

“Most of *Nepenthes* species we have in the country are endemic to the Philippines or only found in the country and nowhere else in the planet,” Lagunday mentioned. “[Flora and fauna] works have to be conducted to assess the biodiversity, ecological, and conservation status of the species harbored by these mountain ranges. The data gathered will then be used as basis for the full protection of the area and its remaining biodiversity by a republic act,” he added.



NOT A WALK-IN-THE-PARK This is how Noel Lagunday (second from right) describes his scientific expedition with Datu Novo M. Sabas (rightmost), and their research assistants Jeff Carolino (leftmost) and Kyla Bocala (in pink jacket). Photo courtesy of Harold C. Armecin.

Man-made destructions

Illegal logging, slash-and-burn farming, and poaching of plants and animals for economic purposes endanger not only the plants but the whole ecology of the mountain as well. “But political instability and tribal animosity seem to be holding the gates thus minimizing anthropogenic destructive activities,” Lagunday explained.

Political instability is not new to scientists who study in the mountains. Last 2009, Leonard Co, a renowned Filipino botanist, was killed in Kananga, Leyte. Co and his companions were thought to be members of the New People’s Army; thus they were shot by the Philippine Army. Last 2013, the PJS released a special issue in his honor. His murder case is yet to be resolved.

Son of a Respected Datu

Bloodline served as an advantage to Lagunday. As a son of an esteemed *datu* or chieftain of Talaandig tribe, Lagunday was granted special access together with his team to the unexplored mountains of Central Mindanao. He himself is actually a Lumad of Bukidnon.

When scientists want to know if an organism is new to science, they refer first to taxonomic key, (a device to identify unknown/classified organisms), and other journal articles to identify it. If keys and published papers could not point them to an already-discovered organism, most likely the organism is new to science. But scientists need to report their paper first to a journal so other experts can review or evaluate the new scientific findings.

Lagunday assured that “there are more species out there just waiting for discovery.”

The full article of the paper “Two New *Nepenthes* Species from the Unexplored Mountains of Central Mindanao, Philippines” can be downloaded for free in the PJS Vol. 146 No. 2 at philjournalsci.dost.gov.ph. The PJS Special Issue for Leonard Co can be read also for free at the PJS website.



HONORING HIS FELLOW MANOBO Lagunday poses with some children in one of the Manobo villages in the area. Photo courtesy of Adeline Calaguian.

HILLARY DIANE ANDALES

Breaking the Mystery of Relativity

By Rosemarie C. Señora, DOST-STII



Photo by Henry A. de Leon

The Philippines is once again put on the world map as a grade 12 student from Eastern Visayas surprised everyone with her winning of what is considered as the “Oscars” in the world of science.

Hillary Diane A. Andales of the Philippine Science High School-Eastern Visayas Campus (PSHS-EVC) in Palo, Leyte bagged the grand prize of the 2017 Breakthrough Junior Challenge last 3 December 2017 (4 December in Manila) at the NASA Ames Research Center in Silicon Valley, California, USA.

Her winning three-minute video entry was about the Feynman’s path integrals, with her explaining the theory of relativity and the equivalence of reference frames.

The previous year, Andales bagged the Breakthrough Junior Challenge Special Prize and won a \$100,000-Science Lab for her school.

Organized by the Breakthrough Prize Organization, Breakthrough Junior Challenge is an annual global competition for students aged 13 to 18 from countries across the globe to inspire creative thinking about science. The students are invited to create and submit a three-minute original video that brings to life a concept or theory in the life sciences, physics, or mathematics.

As the grand prize winner who bested more than 10,000 students from 178 countries around the world, Andales was able to bring home a scholarship

worth \$250,000 (P12,670,000) college scholarship, and a new science laboratory worth \$100,000 (P5,069,000). The lab was designed by the Cold Spring Harbor Laboratory.

These are in addition to the \$100,000 state-of-the-art DNA molecular biology laboratory she won last year for her school which was severely damaged by typhoon Yolanda.

In her interview with the magazine Asian Scientist, Andales said that her family has always been interested in science.

“My father, Roy Andales, is a chemist who is really fond of physics while my mother, Imelda, is an accountant who also likes science. They are

the ones who encouraged me to read books and keep abreast with the latest science news,” she said, adding that she also has a younger brother who is also a student at the PSHS or “Pisay.”

As for the topic of her winning entry, the grand winner said that right after dealing with the results of the previous competition, she started looking for new topics and prepared for what can be considered as a tedious process of video making and editing.

“Last summer, I started to write the script. After about 20 drafts and some 200 hours of animation and shooting, I came up with a new video. My father helped me a lot through the whole process; he was the one checking the scripts,” she said.

Her inspiration

Aside from her family and friends being her inspiration, Andales said that one of the scientists she looks up to is Filipino astrophysicist and data scientist Dr. Reinabelle Reyes.

“Her story amazes me. I also love that she is into science communication too. I also look up to Richard Feynman, like any other physicist does. I get really, really excited whenever I hear him speak and when I read his works,” she said.

In addition to this, she said that during their internship in 2015, she had the honor of being mentored by another physicist at the University of the Philippines National Institute of Physics, Dr. Francis Paraan. “We were programming different things in his laboratory, the Structure and Dynamics Group,” said Andales.



A screen shot of her winning video that explains relativity in daily life. Observer A sees figure 9 while Observer B sees figure 6 and they are both right, depending on one's vantage point.

The future generation

She believed that the youth has a huge potential and responsibility towards future generations.

“We need to take care of the world we're living in as we will soon inherit this world. We have the responsibility to make this world a better place to live in and science can help us do that. A generation that appreciates science can take care of the world better,” she said.

“May this inspire more young people, especially my dear Filipinos, to look up and become scientists themselves—the stars we should all look up to,” said Andales, who, after this huge achievement, plans to pursue a research career in physics, probably with expertise in fundamental or particle physics.

Testament to this, she was awarded the “Mga Bagong Rizal: Pag-Asa ng Bayan” for her strong advocacy for Science, Technology, Engineering, and Math education and awareness.

Mga Bagong Rizal: Pag-Asa ng Bayan is a biennial search for young Filipinos who demonstrate extraordinary abilities and gifts in various fields while exemplifying love for country, reflective of the national hero Dr. Jose Rizal's virtues.

(With reports from Romelie Janelle Maranan, DOSTv)



Photo grab: Hillary Andales Facebook

**NEXT PAGE:
KNOW MORE ABOUT HILLARY'S
BREAKTHROUGH JUNIOR CHALLENGE
EXPERIENCE**



IT FINALLY HAPPENED

By Hillary Diane A. Andales, PSMS-EVC

(Editor's Note: This is Hillary's post dated 08 December 2017 on her Facebook account, reprinted on the S&T Post with her permission and with very minimal editing)

Last year, I joined the Breakthrough Junior Challenge for the first time. I toiled through sleepless nights just to research, make the script, edit, animate, and learn everything on my own. All throughout, I was kept alive and motivated by my own vision of me finally receiving the award onstage at NASA Ames. But it never happened.

Initially, I was devastated. I felt like I disappointed the thousands of people who voted for me in the Popular Vote Challenge. Yet, there was something in me that was itching to try again.

I collected myself and decided to join again. I started passively looking for topics – quantum electrodynamics, perturbation theory, general relativity, quantum chromodynamics – I was all over the place!

This was undoubtedly the hardest part because the topic had to be big, complex, unique, and relatable to a layman audience. I also had to do intensive research so I could completely understand the material and deliver it to the audience in an accurate, creative, and engaging manner.

Afterwards, I wrote the script. I started with a file called “BJC 2017 Script v1” and ended with “BJC 2017 Script v17 FINAL FINAL EDITED PRINT PLS.” Once I finished scriptwriting and filming, I began editing and animating, all while watching around 200 YouTube tutorials like “how to make jiggly text” and “wave effect after effects.” Altogether, I spent about a year making this little three-minute video. (And they say joining the Junior Challenge is easy. It’s called a “challenge” for a reason)

After an arduous process, I submitted it. The waiting began. The anxiety crept in. This time, I was confident because I knew that I had improved on my weaknesses from the previous year. However, I was also scared because I had gone so far last time that I felt like I had to go further.

The waiting persisted. I felt like the waiting never stopped. But it finally did. A call came in and told me that I actually won the 2017 Breakthrough Junior Challenge out of 11,000 entries worldwide. Next thing I know, I’m at NASA Ames actually receiving the award in front of the world’s greatest scientists and innovators. IT FINALLY HAPPENED!

For me, the entire thing has been a whirlwind experience and it didn’t sink in until earlier today. While on a two-hour car



Photo grabbed from Breakthrough Facebook page

trip listening to Hillsong, I could not stop crying. I realized how much my life will change because of this. I realized how lucky and blessed I am to have my secret dream come true. I realized just how huge this was—and I am truly, truly grateful for everything.

First of all, I thank my family with all the matter in me for simply existing and for encouraging me like they have always done. They were there when I was anxious, frustrated, and desperate for feedback on my script. (They were actually more anxious than I was.) I share this achievement with them. They ignited my passion for science and I will keep this flame burning for them.

Of course, I also give my biggest thanks to the Breakthrough Prize Foundation for making this all happen! To the founders and Breakthrough staff who warmly accommodated me and made me feel like I was genuinely contributing something to the world, I cannot thank

you all enough. You have changed my life in ways I could have never dreamed of.

I also thank our energetic Campus Director Rey Garnace for the crazy amount of support ever since last year. To Sir Xavier, friends, relatives, the whole Philippine Science High School - EVC fam, fellow Filipinos, and even the random strangers who voted for me, I bow to you all and offer my sincerest thanks. You are all amazing and I still find it hard to grasp that you've taken time to support me. THANK YOUUUUU SO MUCH EVERYONE!

Now that I have been given this platform to speak to many more people, I want to encourage other young people to be ambitious and dream big. The world needs more dreamers!

Other than that, I want to tell everyone (and I mean everyone) that science is interesting and worthwhile. I want (no, need) everyone to appreciate it! Science is beyond the equations and

the intimidating terms; science is the way we understand the Universe. Everything around you can be explained by science: how plants make food, how the sun keeps burning, how your eyes are reading this, and the list goes on indefinitely. Science has also given us the wealth of digital technology which is ironically used to denounce its value.

In the future, I hope that this achievement will inspire and ultimately create new scientists (because they change the world with their minds and they're cool that way). I also hope to continue working for science beyond the Junior Challenge. I do not wish to be stuck as the "student who won P20M in a science competition." I want to make a bigger difference in the world for others.

I am beyond elated that my secret little dream finally happened. Now, I can dream bigger. If it ever happens, I hope I can leave a greater impact with it.



Breakthrough Junior Challenge
<https://breakthroughjuniorchallenge.org/>

My Video Entry
<https://www.youtube.com/watch?v=TLfZiGQjVT8>

Behind The Scenes
<http://hillaron.com/behind-the-scenes-breakthrough-junior-.../>

Awarding Ceremony (Skip to 33:30 to watch the BJC 2017 Awarding)
<https://www.facebook.com/BreakthroughPrize/videos/1965587930133220/>

Breakthrough Prize Press Release
<http://www.spaceref.com/news/viewpr.html?pid=51914>

DOST honors exemplary agencies, employees and Pisay studes for 2017

By Jasmin Joyce P. Sevilla, *DOST-STII*

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



Among the awardees during the year-end celebration of DOST were DOST-ITDI Director Dr. Maria Patricia V. Azanza (left) and Undersecretary for Regional Operations Brenda L. Nazareth-Manzano (right). With much pride, DOST Secretary Fortunato T. de la Peña (middle) presents the award to DOST-ITDI and DOST regional offices to recognize their initiatives that surpass customer requirement.

DURING THE annual holiday celebration of the Department of Science and Technology (DOST), seven DOST-attached agencies, eight DOST employees, and nine DOST-Philippine Science High School (PSHS) students were given recognition for their utmost contribution in various areas of science and technology for 2017. The awarding ceremony was held on 12 December 2017 at the DOST Grounds.

DOST Secretary Fortunato T. de la Peña led the awarding to the following agencies: DOST-Food and Nutrition Research Institute (DOST-FNRI) (NAST's Best Institute Award); DOST-National Capital Region (Gold Anvil Award); DOST-IX (Development Academy of the Philippines' Government Best Practice Recognition 2017); DOST-Science and Technology Information Institute's STARBOOKS (Gold Anvil Award); DOST-Industrial Technology Development Institute (DOST-ITDI) and DOST regional offices (Benita & Catalino Yap

Foundation (BCYF) Innovation Award for Government Service); DOST-Philippine Nuclear Research Institute (DOST-PNRI) Research Team (2017 Excellent Research Team of the Year Award of Japan-based Forum for Nuclear Cooperation in Asia [FNCA]); and DOST-FNRI and DOST-XI (Outstanding Government Workers Award [PAGASA Award]).

On the other hand, the DOST employees who received recognition during the annual holiday celebration were: Ana Marie P. Alo from DOST-Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD) (2017 PhilEASNET Outstanding Extension Project Award); Fernando B. Aurigue from DOST-PNRI (conferred Scientist I under the Scientific Career System); Glenda Obra from DOST-PNRI (conferred Scientist I in the Scientific Career System); Dr. Annabelle V. Briones from DOST-ITDI (NRCP's Achievement Award for Chemical Sciences;

and conferred Scientist I in the Scientific Career System); Dr. Rosalinda C. Torres from DOST-ITDI (conferred Scientist I under the Scientific Career System); Dr. Marissa A. Paglicawan from DOST-ITDI (conferred Scientist I under the Scientific Career System); and Dr. Maria Patricia V. Azanza from DOST-ITDI (Gregorio Y. Zara Award, Julian Banzon Outstanding R&D Award; and DOST International Publication Award); and Dr. Alexander R. Madrigal from DOST-CALABARZON (GAWAD KALASAG Award - National Level) of the Regional Disaster Risk Reduction and Management Council).

Sec. de la Peña also proudly presented the certificates of recognition to selected PSHS students who excelled in prestigious science competitions, namely: Maria Janine L. Juachon from PSHS-Central Luzon Campus (CLC) (Bronze Medal in the 11th International Earth Science Olympiad); Charles Jerome R. Bartolo from PSHS-Central Luzon Campus (CLC) and Arthur



DOST-STII Director Richard P. Burgos (left) receives the award for STARBOOKS.

Reiner V. De Belen from PSHS-Main Campus (MC) (Bronze Medal in the 2017 International Chemistry Olympiad); Philippe Gene Bungabong, Maded Batara III, and Justine Marcus Oplencia from PSHS-MC (Silver Medal in the 2017 Clean Tech Competition); Kyle Patrick Dulay from PSHS-MC (Silver Medal in the 58th International Mathematical Olympiad); Mikhail Angel C. Torio from PSHS-MC (Silver Medal in the 11th International Earth Science Olympiad); Eugene Fajardo Torribio from PSHS-Bicol Region Campus (BRC) (Silver Medal in the 11th International

Earth Science Olympiad); Dann Lawrence Labore from PSHS-Southern Mindanao Campus (Bronze Medal in the 14th International Geography Olympiad); Mikhail Angel Torio from PSHS-MC, Eugene Fajardo Torribio from PSHS-BRC and Maria Janine L. Juachon from PSHS-CLC (Gold Medal in the 11th International Earth Science Olympiad); and Hillary Diane Andales from PSHS-Eastern Visayas Campus (Grand Prize winner in the 2017 Breakthrough Junior Challenge).

In addition, two DOST executives on secondment status were given due distinction

for their exemplary service to their respective agencies. DOST-ITDI Director Dr. Maria Patricia V. Azanza and DOST-Philippine Council for Industry, Energy and Emerging Technology Research and Development Executive Director Dr. Carlos Primo C. David were both professors at the University of the Philippines Diliman before they were appointed to their corresponding agencies in 2014 and 2015, respectively. By January 2018, they will resume their teaching profession in UP Diliman.

Hillary Diane A. Andales (right) receives the award from DOST for winning the grand prize in the 2017 Breakthrough Junior Challenge.



DOST-IX receives government best practice award

By Bon Rafael A. Padayhag, DOST-IX

Photo by DOST-IX



DOST-IX staff who received the award led by then Officer-In-Charge (now Regional Director) Martin Wee.

FOR INNOVATIVELY addressing customers' needs through an online referral system, the Department of Science and Technology Region IX (DOST-IX) received the Government Best Practice Recognition 2017 (GBPR) award from the Development Academy of the Philippines.

DOST-IX was recognized for its innovative and customer-focused "Online Referral System" which grants the public access to the agency's testing and calibration services no matter where they are in the country.

Through the referral system, the customers' needs are addressed at a single touch point. Samples are handled promptly and seamlessly—

from receiving and referral down to transport and analysis—allowing for the timely delivery of results to waiting customers.

DOST-IX was one of the five finalists that received the recognition.

The awarding ceremony was held on 11 October at the Development Academy of the Philippines in Tagaytay City.

The GBPR seeks to recognize successful and validated practices demonstrated by all public sector organizations. It also provides a platform to showcase and promote these practices as a way to foster knowledge sharing and to contribute in sustaining performance results.

DOST-XII awards best inventors in the region

By Framelia V. Anonas, DOST-STII

Photo by Gerardo G. Palad, DOST-STII

THE BEST inventors in SOCCSKSARGEN brought home the bacon in the 2017 Regional Invention Contest and Exhibit held at the KCC Convention Center, General Santos City on 17-19 October 2017.

Winning the Outstanding Utility Model were Julie E. Albano and Richie B. Espallardo from the Sultan Kudarat State University in Tacurong City for their utility model named *High Intensity Light Emitting Diode Squid Flashing Device* with Reg. No. 2-2015-000003.

The Likha Award (Creative Research), meanwhile, went to the team of Maria Amelia R. Punla, Tres Tinna B. Martin, Dr. Edna P. Oconer, and Christine Dawn G.

Obemio of the Mindanao State University – GSC for their research *Evaluation and Development of Nutraceutical and Cosmeceutical Products from Saluyot (Corchorus olitorius) and Okra (Abelmoschus esculentus): Protective and Preventive Alternatives for Health and Wellness*.

A very practical and usable student research named *Electronic Mosquito (Culicidae) Repellent Bracelet* bagged the Sibol Award (Student Creative Research for College). Researcher Kenny Walter C. Diolola of the Notre Dame of Kidapawan College and his coach Engr. Mar Lou P. Galinato received the award.

Students of the Philippine Science High

School-SOCCSKSARGEN Campus composed of Xyz Phoelane Beth-Amiel C. Dagum, Ysadell V. Bernardo, Bea May Clarisse A. Tacdoro, and Ericka Michelle L. Factor with their coach Kevin Daga-as pocketed the Sibol Award (Student Creative Research for High School) for the research *pinDOT: Low-Cost Arduino-Based Braille Printer*.

There was no winner in the Outstanding Industrial Design category.

The Board of Judges was composed of Joseph Chua-Kao, CPA; Dr. Emmanuel Leaño; Dr. Jonaib Usman; Engr. Allan Rafols; Capt. James Reamon; and Engr. Jessel Cofleros.



DOST-MIMAROPA awards the region's best technopreneurs

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

Photos by MIMAROPA



DOST-MIMAROPA presents the Winners of the 2017 Best Technopreneur Awards during the Changing Lives through Science Event in Odiongan, Romblon.

THIRTEEN NOMINEES vied for the 2017 Best Technopreneur title under the Core and Non-Core Categories in the Department of Science and Technology (DOST)-MIMAROPA's annual search for Best Technopreneurs. The search, which included micro, small, and medium enterprises (MSMEs) and community-based enterprises (CBEs), had its awarding during the 5th Best Technopreneur Awards at Virginia Centurione Bracelli School in Odiongan, Romblon. The awarding ceremony was part of the regional celebration of the S&T Week dubbed as "Changing Lives through Science."

Named as the 2017 Best Technopreneur for the Core Category was Shapes Bakeshop, a well-known producer of flat breads, cookies, and pastries in Romblon. Shapes Bakeshop sought DOST's assistance in upgrading its baking facility in terms of the firm's overall operations through the Manufacturing Productivity Extension Program (MPEX) and Consultancy for Agriculture and Manufacturing Productivity Improvement (CAMPI) Program; production

of better products and services through acquisition of cGMP-compliant (Current Good Manufacturing Practices) food technologies such as heavy-duty oven, mixer, and dough kneader; and enhanced quality and appearance of products through packaging and labelling assistance.

Meanwhile, Balanacan Multi-Sectoral Credit Cooperative (BMSCC) from the province of Marinduque bagged the 2017 Best Technopreneur title for the Non-Core Category. BMSCC was the very first firm to acquire the vacuum fryer technology in the province of Marinduque through the assistance of DOST and Department of Labor and Employment. According to Celso Quinto, president of BMSCC, DOST's interventions have helped cooperative become one of the most established businesses in the province.

"Napakalaking tulong po ng mga intervention ng DOST tulad ng pagbigay ng vacuum fryer para sa dilis, pagsasaayos ng packaging, pagbibigay ng mga trainings kagaya ng GMP and food safety, mga

consultancy sa MPEX at CAMPI," he said.

(DOST's interventions are of great help such as the vacuum fryer which we use for anchovies, which is the first in the country, as well as in improving our packaging, and providing training such as GMP and food safety, and consultancy services such as MPEX and CAMPI.)

"Higit sa lahat ay ang pagtulong sa amin upang higit na maibenta ang aming produkto sa tulong ng Mimaropa Ventures, isang online selling website, at ang pag representa po ng inyong lingkod sa programang Radyo Negosyo ni Dr. Carl E. Balita na lubhang nakatulong upang mas makilala ang aming produkto sa buong bansa," he added.

(Most of all, I am thankful for the help in making our products more saleable through Mimaropa Ventures, an online selling website, and when I represented the cooperative in the Radyo Negosyo program of Dr. Carl Balita. This greatly helped in making our products more popular in the country.)

Other winners in the Core Category were Brilliant Juice Manufacturer of

Marinduque (second place) and Ashley Bakeshop and Restaurant of Romblon (third place). Meanwhile, other winners in the Non-Core Category were Kalipunan ng Liping Pilipina (KALIPI)-Sta. Fe Chapter of Romblon (second place) and Maharlika and Little Caramay Abaca Growers Association of Palawan (third place).

Winners received plaques of recognition and cash prizes. The 2017 Best Technopreneur Awards selection committee was composed of members from DOST-MIMAROPA's Regional Technical Evaluation Committee.

The Best Technopreneur Awards is given to exemplary MSMEs and CBEs in the region who have infused science, technology and innovation into their enterprises' success. It aims to distinguish entrepreneurs who, through the Small Enterprise Technology Upgrading Program of DOST, have improved their business productivity, profitability, employment, and overall contribution to the regional economy. The award hopes to encourage and inspire MSMEs, CBEs, and budding entrepreneurs to embrace the culture of science, technology, and innovation in doing business to further spur inclusive economic growth in the MIMAROPA region.



Celso Quinto, BMSCC president, receives the 2017 Best Technopreneur title for the Non-Core Category in behalf of the cooperative. Photo by Henry A. de Leon



Kim Fernandez of Shapes Bakeshop receives the 2017 Best Technopreneur Award for Core Category

Candon, Laoag now in sync with PH standard time

By Dr. Aristotle P. Carandang, *DOST-STII*

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



AMID SIMPLE ceremonies, the cities of Candon in Ilocos Sur and Laoag in Ilocos Norte officially switched on their time pieces conspicuously mounted in the center of their respective cities. The time pieces were put in sync with the Philippine Standard Time or PhST which is managed and maintained by the Philippine Atmospheric, Geophysical and Astronomical Services Administration or PAGASA under the Department of Science and Technology (DOST).

The launch, organized by DOST-I, was within the celebration of the Regional Science and Technology Week held 3-6 October 2017 in various parts of the region with the main celebration held in Candon City.

"It is a continuing information campaign about the value of time and the need to respect the time of others in order that the people may realize the importance of synchronized time," according to DOST Region-I Director Dr. Armando Q. Ganal.

Meanwhile, DOST Undersecretary Brenda Nazareth L. Manzano said, "Time is more valuable than money for we are all only allotted a certain amount of time in our lives. And so, we need to make sure that we use it wisely."

The importance to synchronize all time pieces is highlighted under Republic Act 10535 or the Philippine Standard Time Act of 2013. It is an act to set the Philippine Standard Time in all official sources throughout the country, to provide funds for the installation, operation and maintenance of synchronized time devices to be displayed in key public places and to declare the first week of every year as National Time Consciousness Week.

PhST is an advocacy of the DOST which it calls Juan Time – the New Filipino Time. The advocacy's main aim is to synchronize the time in the whole archipelago and likewise to change the notorious "Filipino Time" of being late. The law says that all government offices and media

networks are required to use the PhST as a basis to set their time pieces. The law also sets penalties for institutions that do not comply with the requirements of the PhST.

In Ilocos Sur, Candon City Mayor Ericson G. Singson thanked the DOST for the partnership and for providing the digital clock that is in sync with the DOST-PAGASA atomic clock. "Respect time, value your time, and respect the time of others," he advised.

Meanwhile, Mayor Chevylle V. Fariñas of Laoag City, Ilocos Norte shared, "Whenever they see Juan Time, we are reminded that here in Laoag City we don't buy that reasoning na awan time." She explained that awan, Iloco term for "no" or "none," is not acceptable since everyone can have the time if they want to. "May time pag gusto (There is time [for something] if you want to have time)," she said.



Interactive teaching tool wows students and teachers in Candon City, Ilocos Sur

By Jasmin Joyce P. Sevilla, *DOST-STII*

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

DURING THE recently held Regional Science and Technology Week (RSTW) in Candon City, Ilocos Sur, the Department of Science and Technology-Science Education Institute (DOST-SEI) led a two-day interactive seminar on 3-4 October 2017 among public school teachers and students within the region. Spearheaded by Josephine S. Feliciano, a science research specialist of DOST-SEI, the event featured the virtual and augmented reality tools that can be used for a more effective and interactive way of teaching and learning.

Virtual reality (VR), by definition, is an artificial simulation or re-creation of a real life environment or situation. Augmented reality, on the other hand, shows the actual view of the real world environment but with added or “augmented” computer-generated elements such as sounds, videos, and photos.

Both of these technologies immerse the users by making them experience the simulated reality firsthand through visual and hearing stimulations.

According to Feliciano, these tools were initially introduced in gaming softwares and applications but they thought of incorporating it in teaching as well for a more fun, exciting, and interactive way of learning. Feliciano also explained in the seminar that these technologies are part of DOST-SEI’s Access to Resources and Innovations in Science Education (ARISE) program.

Launched in December 2015, ARISE is a 21st century ecosystem of learning environments, education, information and communications technology resources, and innovations that serves as a support to the K to 12 Curriculum and Science, Technology,

Engineering, and Mathematics (STEM) education.

One VR tool presented during the seminar is the VR box that turns the visuals projected on a smart phone device into a virtual reality experience. It can be bought online or through physical stores but it can also be made using cardboard boxes and a pair of biconvex lens. Teachers could use this device for a more detailed and elaborate explanation of their lessons such as introduction to marine and wildlife habitat, for example, or a peek through the planets in the solar system. Through the VR box, the students can actually see and experience what it’s like under the sea or what it feels like to be out in space just by sitting on their chairs.

DOST-CAR launches program on climate change adaptation

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

Photos by Kimverlyn C. Sayson, *DOST-STII*



DOST-CAR Director Dr. Victor B. Mariano (third from left) and Tabuk Mayor Ferdinand B. Tubban (fourth from left) present the ceremonial check for the financial assistance given to state colleges and universities in the region to fund climate change and adaptation program

IN AN effort to address the negative impact of climate change and implement science-based solutions to minimize its effects and ensure the viability of agricultural programs, the Department of Science and Technology-Cordillera Administrative Region (DOST-CAR) launched the S&T Action Frontline for Emergencies & Hazards (SAFE) Program. The launch coincided with the celebration of the regional science and technology week of DOST-CAR and was held on 9 October 2017 at the Kalinga State University-Main Campus in Tabuk, Kalinga.

The SAFE Program on Disaster Risk Reduction on Climate Change Impacts on

Agricultural Farms in CAR is a multisectoral initiative spearheaded by the DOST and DOST-Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD), in partnership with the Highland Agriculture, Aquatic and Resources Research and Development Consortium, and the six participating state colleges and universities (SUCs).

“On behalf of DOST Secretary Fortunato T. de la Peña, we are fully supporting the SAFE Program and he will be very happy to know that the SUCs here in the Cordillera region are doing research and development (R&D) to study ways to minimize the negative effects

of climate change particularly in agriculture,” said DOST-CAR Director Victor B. Mariano who represented the DOST Secretary.

Director Mariano further said that researches that remain on shelves are useless. Thus the importance of the SAFE Program is very obvious as it represents the results of R&D. This is the reason why the funding agency, DOST-PCAARRD, did not hesitate to provide P43 million in assistance to the SUCs.

Dr. Carlito P. Laurean, vice president for research and extension of the Benguet State University and the program leader, presented the components of the SAFE Program. He explained how it will be implemented in the

six provinces in CAR to get the most benefits for the farmers who are the most vulnerable and at risk of climate change.

The SAFE Program has six project components, including the one launched for Kalinga State University that focuses on the different conditions of the different provinces in CAR.

Project 1 is about Disaster Risk Reduction Climate Change Impacts on Vegetable Farms in Abra. The project will be implemented by the Abra State Institute of Science and Technology. The project is headed by Dr. Vicente A. Ato and received a funding of P6.991 million.

Project 2 is about Disaster Risk Reduction Climate Change Impacts in Agricultural Farms in Apayao Province to be implemented by the Apayao State College. Dr. Reymalyn C. Aman heads the project which has a funding of P6.289 million.

Project 3, titled Disaster Risk Reduction Climate Change Impacts on Vulnerable Terrace Farms in Benguet, is led by Dr. Carlito P. Laurean of the Benguet State University. It has a total funding of P10.299 million.

Project 4 deals with Disaster Risk Reduction Climate Change Impacts on Rice and Vegetable Farms in Ifugao and a funding of P6.109 million. It will be implemented by the Ifugao State University through Dr. Teresita D. Allig.

Project 5 is called Disaster Risk Reduction Climate Change Impacts on Vulnerable Coffee Farms in Kalinga to be implemented under the leadership of Dr. Robert A. Rodolfo of the Kalinga State University. Funding for the project is P6.312 million.

Lastly, Project 6 titled Disaster Risk Reduction Climate Change Impacts on Vulnerable Farms in Mountain Province will be implemented by the Mountain Province State Polytechnic College. The



DOST-CAR Director Dr. Victor B. Mariano stresses the importance of using science and technology in helping minimize the negative effects of climate change, particularly in agriculture.

P7.097 million-project is led by Elmer D. Pakipac.

The launch was attended by DOST-Science and Technology Information Institute Director Richard P. Burgos, Gary Damian representing Kalinga Representative and Vice Chair of the House Committee on Science and Technology Allen Jesse C. Mangaoang, Tabuk Mayor Ferdinand B. Tubban, DOST-CAR Director Victor

B. Mariano, Supervising Science Research Specialist Noel A. Catibog representing DOST-PCAARRD Executive Director Dr. Reynaldo V. Ebora, Benguet State University President Dr. Feliciano G. Calora Jr., Dr. Carlito P. Laurean of Benguet State University and SAFE Program Leader, and Kalinga State University President Dr. Eduardo T. Bagtang.

SETUP SUCCESS STORIES IN GENSAN

By Framelia V. Anonas, *DOST-STII*
Photos by Gerardo G. Palad, *DOST-STII*

Solid and durable, these words describe not only this company's products but the company as well. Gensan Rafols Industrial Machine Shop, Inc., first established in 1960 as a machine shop that also provides engineering services, now offers various services such as fabrication, repairs and maintenance, engine reconditioning, and towing services. Its various services made its current owner, Engr. Allan B. Rafols, (center) realize the need for more advanced machinery to cater to the growing market demand. He availed of various support from Department of Science and Technology (DOST-XII), including the procurement of a 20-foot lathe machine that buoyed up the company's production, including product quality. The company was trained in Manufacturing Productivity Extension Services that extensively enhanced the managerial capability and technical skills of the workers. Its personnel were also trained in equipment operation, maintenance, and even in appearance improvement. No wonder the firm's productivity shot up dramatically from a monthly sale of P100,000 to P3 million. The company now has added branches and expanded its production area by constructing a new building. Expanding its services, the company recently launched the Rafols Tires and Service Center. Rafols now has 110 regular workers who attest to having a positive change in their lives. In photo: Engr. Rafols is congratulated by DOST Secretary Fortunato T. de la Peña (left) and Dr. Zenaida P. Hadji Raof-Laidan (right), DOST-XII regional director.



VL Food Products is making a crunchy crack, just like its tuna chicharon, into the tuna market. It has 19 product lines, four of which are top sellers in the business that sent Mrs. Lorna Mosquite's children to school. Customers flock to its store and outlets for its famous tuna chorizo, embutido, lumpia, nuggets, miniballs, siomai, hotdog, sausage, calamares, burger patty, tocino, and others. Various forms of support from DOST-XII helped raise the company's production volume by 30 percent and productivity by 35 percent, and improve its product quality, shelf life, packaging, and labelling. More workers were hired too which, when coupled with broader market avenues, naturally led to increased company sales.

More (brown) rice, please. The increasing demand for brown rice made Romulo B. Solivio, Jr. (2nd from left), owner of Sunrice Solivio Rice Mill, look for ways on how to lengthen the shelf life and increase the production of brown rice. Through the help of DOST-Small Enterprise Technology Upgrading Program (SETUP), the company was able to use technology that improved its production of up to 22,000 sacks per month, enabling it to supply various supermarkets and groceries in the cities of Koronadal and General Santos. DOST also enabled the company to acquire machines such as the dehydrator and vacuum sealer machine that prolong the shelf life of the brown rice by controlling temperature and removing moisture. Technical consultancy on Manufacturing Productivity Extension Program, likewise, greatly improved overall operation as the company was given access to technologies to help it run more efficiently.



Tissue-cultured banana seedlings abound in the location of Greenlands Agritech Ventures in Brgy. Isidro, General Santos City. The firm which was originally a plant nursery contracting tissue-cultured meristems from various banana laboratories in Davao now has a sophisticated laboratory that produces over a hundred thousand planting materials in a year. It also has a bigger nursery for mass production and further research and development of tissue cultures. Helping the firm flourish are various kinds of support from DOST-XII such as acquisition of various equipment to boost production, training on current Good Manufacturing Practices and Hazard Analysis and Critical Control Point requirements. As a result, the firm increased its production volume by more than 100 percent as well as its market range, added workers, and dramatically lowered microbial contamination of plant tissues from 15 to the current three percent. Upper photo: With Sec. de la Peña and Dir. Laidan is the firm's owner Remedios S. Flamiano (middle). Bottom photo: Tissue-cultured banana plantlets in various stages in the firm's laboratory.

(Photos by Framelia V. Anonas)



It's like a scene from Charlie Wonka and the Chocolate Factory. Chocolate bars in every flavor one can imagine, most of which are not yet produced by other brands in the market. Most amazing is the label design of the sweet things ethnic textile designs of various Mindanao tribes which make every piece a work of art. According to owner Ma. Arlene A. Motong, Great Harvest Food Industry was established in 2010 with dried fruits as primary product. Good feedback from customers encouraged her to venture into other products such as salad dressing and personalized chocolate bars with different flavors using Barry Callebaut Chocolate and Bensdorp Cocoa as base ingredients. Technology upgrading of the company's chocolate processing facilities swelled its production volume to more than 100 percent even as it improved its product quality and shelf life, plant layout, packaging and labelling, and market reach, all of which subsequently resulted in increased company sales. Currently, the company has secured its License to Operate from the Food and Drug Administration.





Biotech week highlights R&D that improve people's lives

By Allan Mauro V. Marfal, *DOST-STII*
Photos by Gerardo G. Palad, *DOST-STII*

RESEARCH AND Development (R&D) projects of the Department of Science and Technology (DOST) are designed to support various industries and fields such as agriculture, healthcare services, and food manufacturing. R&D programs in biotechnology are likewise geared towards the development of innovative products and services.

"In DOST, all of our researches and services are anchored on wanting to make science and technology applications become an integral part in improving the lives of every Filipino. Among those applications that I am referring to is biotechnology," said Dr. Jaime C. Montoya, executive director of DOST-Philippines

Council for Health Research and Development (DOST-PCHRD) during the closing program of the 13th National Biotechnology Week (NBW) celebration on 24 November 2017 at Fisher Mall in Quezon City.

Montoya said that the public managed to have a glimpse and appreciation of the various benefits of biotechnology through technological products exhibited in this year's NBW festivities.

"All of the products highlighted by DOST for this edition of the National Biotechnology Week seek to give people a better explanation on how biotechnology applications can make a positive impact on different services and fields that many people heavily rely on," Montoya said.

One of the featured DOST products was DOST-PCHRD's funded project called Biotek-M Dengue Aqua Kit, a diagnostic test designed to detect dengue infections in serum/plasma during the first three days of illness. In just an hour after testing, Biotek-M produces the result, giving doctors a quicker way to confirm or rule out dengue.

Aside from Biotek-M Dengue Aqua Kit, other DOST projects featured in this year's NBW celebration were the Bioactive Bamboo of DOST-Forest Products Research and Development Institute; Nutritional Research on Genomics of DOST-Food and Nutrition Research Institute; Molecular Characterization of Edible Mushroom Collection of DOST

Industrial Technology Development Institute; and Mutation Breeding and Tissue Culture for Mangosteen and Efficient Sterilization Technique for Biofertilizer Carrier Production Through Gamma Irradiation both of DOST-Philippine Nuclear Research Institute.

“We are always looking forward to an event like the National Biotechnology Week as it gives opportunities for our researchers, engineers, and scientists to

present to the public their innovative products and researches. NBW provides hope for the public and inspiration for our scientists, especially in the area of biotechnology to discover life changing technologies,” said Montoya.

Aside from the exhibits, DOST also organized various forums during the entire celebration that focused on researches on cardiovascular diseases and diabetes, agriculture and aquaculture, as well as food safety.

Montoya added that the DOST will continue to increase its efforts in advocating for all the developments in the area of biotechnology. He shared that in DOST’s harmonized R&D agenda, biotechnology is included as one of the core fields in the program.

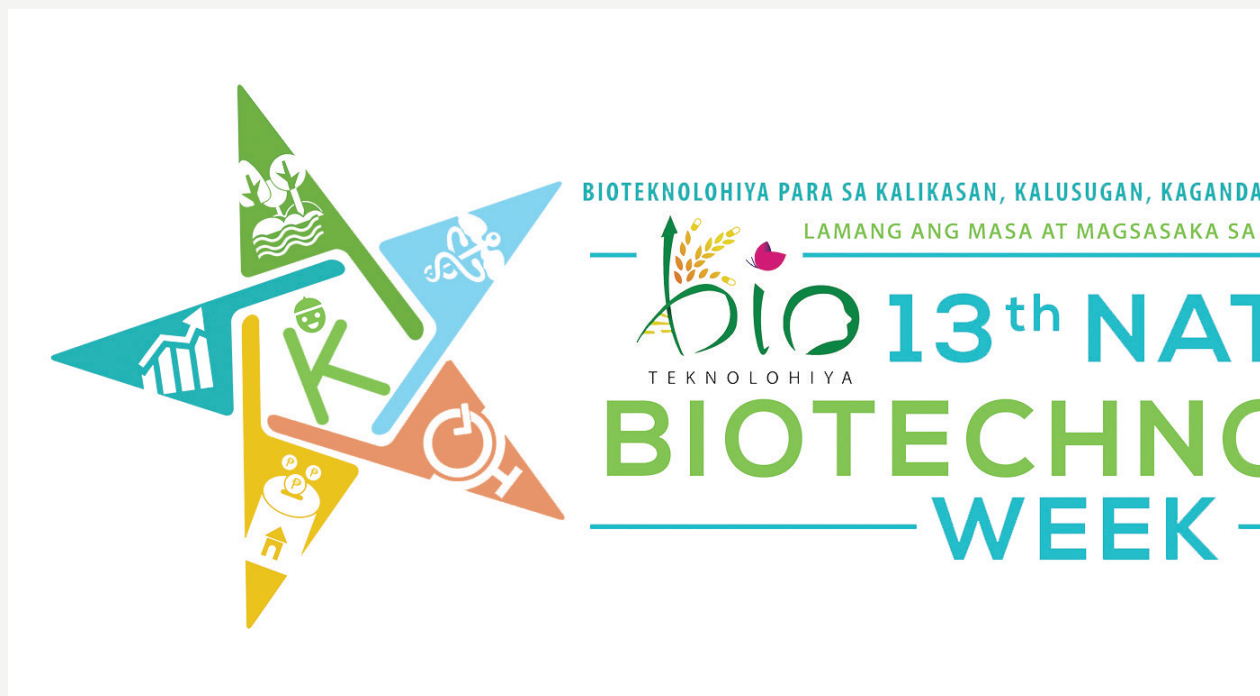
Montoya also represented DOST Secretary Fortunato T. de la Peña in accepting the chairmanship from the Department of Agriculture for hosting the 2018 NBW celebration.



Juan Carlo J. Longamen, a librarian from Department of Science and Technology-Science and Technology Information Institute explains to guests the contents of the STARBOOKS or Science and Technology Academic and Research-Based Openly Operated Kiosk. Installed in said digital science and technology library are local and international science and technology materials in video and audio formats such as math coursewares, livelihood videos, and K-12 materials. (Photo and text by Allan Mauro V. Marfal, DOST-STII)



Andrea Luz G. Nery, science research specialist from Department of Science and Technology-Philippine Nuclear Research Institute gives student-visitors relevant information on the project Mutation Breeding and Tissue Culture for Mangosteen. Ongoing mutation breeding researches on mangosteen at DOST-PNRI seek to obtain varieties with increased yield, improved fruit quality, more desirable agronomic traits, such as short stature to facilitate harvesting, early maturity, and all year round fruiting. (Photo and text by Allan Mauro V. Marfal, DOST-STII)



Gov't execs push for biotech regulation to ensure safety

By Sheila Marie Anne J. de Luna, *DOST-STII*

REPRESENTATIVES OF various government institutions agree that there are many benefits to the use of biotechnology that can help a lot of people and the country's development. However, they are also keen on putting in place regulatory systems to ensure the safety of technology and put people's concerns on biotech applications in check.

Dr. Segfredo R. Serrano, undersecretary for policy and planning of the Department of Agriculture (DA), said that there is no such thing as a riskless state of technology; thus it is important that we know which ones will be good for us and for our country.

"It is very important that we also establish

a regulatory system that can do the assessment and the risk management that can ensure the safety and application of technology," Serrano said.

Moreover, Serrano highlighted what's in store for the future in agricultural biotechnology. "Genetically modified (GM) corn has raised the productivity of our corn farmers. We are now planting more than eight thousand hectares of GM corn," said Serrano.

He also mentioned several GM varieties that are being developed further like the GM *talong* (eggplant) that eliminates heavy pollutants in production, and the golden rice, which Serrano said is "one of the most

efficient ways of addressing passive Vitamin A deficiency, especially among the youth."

Dr. Vivencio R. Mamaril, program director of the Biotechnology Program Office of the DA, talked about how the biotech program under the DA provides grants for research and development, as well as assistance for institutional capacity and development.

Aside from the DA, the Department of Environment and Natural Resources (DENR) also joined in the celebration of the Biotech Week. Gregorio Santos, chief of the Ecosystems Research and Development Bureau of DENR, bared some of the programs of the department that involves the application of biotechnology.

AN, KABUHAYAN, AT KAUNLARAN
 LIMANG "K" NG BIOTEKNOLOHIYA

NATIONAL BIOLOGY

20-24 November 2017



Santos mentioned about the isolated species of fungus used as biofertilizer to enhance the growth of fruit-bearing trees, tissue culture propagation of important species, urban eucalyptus, and the rehabilitation of mined out area in Samar to get rid of heavy metals in soil.

Carmelita Mojica of DENR Ecosystems Research and Development Bureau talked about the microbial enzymes technology that is patented and helps boost growth and survival of plants. She said that the technology has been mass produced already and is now ready for communication.

On the part of the Commission on Higher Education (CHED), Dr. Custer Deocaris, chief of the Research and Management Division, talked about how higher educational institutions (HEIs) help nurture the country's

intellectual capital. He said that HEIs are now tasked to connect to community, society and industries to help spur economic development through science and technology.

For the Department of Science and Technology (DOST), Dr. Jaime C. Montoya talked about the various activities that the department has in store for the public in relation to the celebration of the NBW, which include exhibits, forum, science journalism workshop, and opportunities for the youth to encourage them to take up courses related to biotech and science. It was also announced that for next year's 14th NBW, DOST will be the lead agency.

The celebration of the biotechnology week is a collaboration among the DOST, DA, DENR, Department of Interior and Local

Government, Department of Trade and Industry, Department of Education, CHED, and the Department of Health. The 13th NBW highlighted the importance of modern biotechnology in relation to food security, equitable access to health services, and sustainable and safe environment.

With this year's tagline "Bioteknolohiya para sa Kalikasan, Kalusugan, Kagandahan, Kabuhayan at Kaunlaran: Lamang ang Masa at Magsasaka sa Limang "K" ng Bioteknolohiya", the 13th NBW unveiled the latest in biotechnology innovations, trends, and technologies. Held at the Fisher Mall (exhibit) and Brentwood Suites (fora) in Quezon City, the event ran from 20-24 November.

Journalists recognized for highly informative biotech stories

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

Photo by J. Burgos Media Services, Inc.



JOURNALISTS FROM various publications recently received recognition for their stories that highlight the benefits of biotechnology to society and the Filipino people during the 2017 Jose G. Burgos, Jr. Awards for Biotech Journalism. Now on its 11th year, the said award aims to push the frontiers of science by popularizing biotech stories that make people more aware of this scientific discipline.

For the news category, the story of James Konstatin Galvez of The Manila Times entitled “Challenged SEARCA stresses ‘safe, scientific’ agri technologies” bagged the first place, followed by Jasper Arcalas’ story entitled “Use of high-yielding GM varieties will allow farmers to export corn” which was published in Business Mirror. Finishing at third place was the article entitled “PH is top grower of GM crops in SEA” written by Sun Star Davao’s Ace June Rell Perez.

For the features category, Galvez bagged again the top spot with his article entitled “SEARCA seeks stronger law on biotech crops.” Manuel Cayon of Business Mirror got the second spot with his article “GM crops planted in 185 M ha worldwide.” Rounding up the top three is the story from Stephanie Tumampas

entitled “Filipino scientists, regulators look into GMO perceptions” which was published in Business Mirror.

Recognition was also given to the newspapers with the most number of biotechnology articles published. Business Mirror bagged the first place, second was Philippine Star, and tied in third place were The Manila Times and Manila Bulletin.

The winning articles were chosen by a panel of judges composed of Ares Gutierrez, head of the Public Affairs and Information Services Office of Quezon City; Angelo Palmones, former congressman and radio and television anchor of DZRH and Net25; and Melly Tenorio, radio supervisor and broadcaster of Radyo Pilipinas.

The top three winners in all categories received trophies plus cash prizes with the amount of P30,000.00 given for first place, P20,000.00 for second place, and P10,000.00 for third place.

“It is an honor to be recognized for the Jose G. Burgos Jr. Awards for Biotechnology. The hope of biotechnology journalism is to investigate and deliver the truth about it to the people and the hope that the stories we

writers make will be heard and understood by each and every Filipino,” said Tumampas who bagged the 3rd prize for feature stories category. “We strive our best to deliver what is true and what is there to discuss in order to find the truth, and deliver it at the best language we can in order for us Filipinos to understand these important issues,” Tumampas added.

The awarding ceremony was held on 22 November 2017 at Brentwood Suites in Diliman, Quezon City as part of the celebration of the 13th National Biotechnology Week (NBW). This year’s NBW, held 20 to 24 November, featured exhibits, career talk, and science journalism workshop, as well as technology forums that tackled various biotech applications in agriculture, aquaculture, environment, and health and nutrition.

Organized by J. Burgos Media Services, Inc., the Jose G. Burgos Jr. Awards was one of the main highlights of this year’s NBW that was hosted by the Department of Agriculture in partnership with the Department of Science and Technology and other government agencies. *(With information from J. Burgos Media Services, Inc.)*

DOST officials, academicians hailed as champions of biotechnology

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

Photo by J. Burgos Media Services, Inc.

OFFICIALS FROM the Department of Science and Technology (DOST) and academicians were recognized for their significant contributions in the field of biotechnology during the celebration of 13th National Biotechnology Week.

As part of the five-day festivity, the Department of Agriculture (DA)–Biotechnology Program Office held the second “Filipino Faces of Biotechnology” event on 23 November 2017 at the Brentwood Suites in Quezon City.

Filipino Faces of Biotechnology is an event which aims to honor and celebrate the exceptional contributions and efforts of scientists, policymakers, farmer-leaders, and communicators to the development of biotechnology in the Philippines.

For this year, DOST officials who were named as “Filipino Faces of Biotechnology” included Dr. William G. Padolina, former DOST secretary and president of the DOST-National Academy of Science and Technology (NAST) for leading institutions and furthering more meaningful development agenda for biotechnology; Dr. Reynaldo V. Ebor, executive director, DOST- Philippine Council

for Agriculture, Aquatic and Natural Resources Research and Development for leading institutions for biotechnology research and development; and academicians Dr. Evelyn Mae Tecson-Mendoza for pioneering genetically modified organism research and advancing biotechnology education and Dr. Emil Q. Javier for leading institutions and championing agricultural science.

Meanwhile, former AGHAM Party-list representative and radio broadcaster Angelo B. Palmones was also named as one of the “Faces of Biotechnology” for advocating science and communicating biotechnology for food security and industry development.

Completing the list of awardees were Dr. Segfredo R. Serrano, DA’s undersecretary for policy and planning, for steering biotechnology policies and programs for greater relevance and meaningful impact in agriculture and former Senator Edgardo J. Angara for championing science, technology, and innovation for agricultural development.

“Biotechnology researches are tested and proven when it comes to its ability to provide

further boosts to different industries and produce high value products from various crops such as coconut and banana. Investments in biotechnology projects have to be enhanced, it is not a matter of putting more money but looking at the quality of the research and the kinds of problem that we need to address,” said Padolina.

During the event, DA’s Biotechnology Program Office also announced the criteria for the third Filipino Faces of Biotechnology. The public nomination is open to Filipino individuals who are of good moral character and who work in the fields of agriculture; health; environment; information, education, and communication (IEC); and policy.

Judging will be based on the exceptional contribution to the advancement of biotechnology in the country (90 percent) and awards and/or citations received related to biotechnology (10 percent). The nomination period will run from 8 January to 30 June 2018. Those interested may send their nominations to Director Vivencio R. Mamaril through biotechpiu@gmail.com with the subject “Faces of Biotech Nomination.”





Scientists pitch informative biotech stories

By Allyster A. Endozo, *DOST-STII*

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

IN A forum organized by the Philippine Science High School (PSHS) system, local scientists promoted biotechnology as an exciting and promising career choice among students by imparting their insights on its beneficial impact to Philippine society.

Dr. Edsel Maurice T. Salvaña, director of the National Institute of Molecular Biology and Biotechnology-National Institutes of Health of the University of the Philippines Manila, shared that genuine interest can entice a young mind to embrace biotechnology as an auspicious career path to take. "Doctors can be scientists as well. It is a longer path but, for me, it's still a good path," he said.

In his presentation, Salvaña showcased the ability of the latest medications like the Highly Active Antiretroviral Therapy to practically restore the lifespan of HIV patients.



He deemed such development as a welcome one amid the steep rise in new HIV cases nationwide – from one every three days in 2000 to 30 per day in 2017 – caused by the spread of a novel hyperaggressive viral strain (CRF01-AE) in Southeast Asia.

Salvaña also emphasized the critical role of media influence in spreading awareness and encouraging early onset testing among high risk individuals. “Immediate increase in the number of Filipinos undergoing voluntary testing clearly coincides with greater media coverage on this epidemic,” he said.

For Dr. Maria Corazon A. De Ungria, head of the DNA Analysis Laboratory of the Natural Sciences Research Institute at the University of the Philippines Diliman, biotechnology occupies a decisive yet underrated role in aiding the Philippine justice system. She explained that the proper use of techniques like DNA testing led to the release of wrongfully convicted individuals in actual criminal cases, as well as the precise identification of victims ravaged by calamities and fatal tragedies.

In the context of rampant cases of alleged extrajudicial killings, she asserted the



Dr. Edsel Maurice T. Salvaña encourages student-participants to take biotechnology as a career.



Dr. Maria Corazon A. De Ungria poses with some of the participants.

need for the implementation of more reliable forensic techniques to protect the citizenry from possible abuse by the authorities. “We need powerful tools more than ever to fight back against abuses by those who enforce the law,” she said.

The event dubbed “Exploring Biotechnology: Forum and Career Talks for High School Students” was held on 22 November at the Brentwood Suites in Quezon City in celebration of the 13th National Biotechnology Week held from 20-24 November 2017.

Participants in the forum came from the following schools: Camp Emilio Aguinaldo High School (Grade 10), E. Rodriguez, Jr. High School (Grades 9-10), Manila Science High School (Grade 10), Masambong High School (Grade 9), Quezon City Science High School (Grade 12), San Bartolome High School (Grade 8), Sergio Osmeña High School (Grade 10), St. Mary’s College (Grade 10), and St. Theresa’s College (Grade 10).



Science journalists share biotech writing tips

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

THE FACT that science news now appears in newspapers shows that people appreciate the value of science in society today. This is a breakthrough from the old notion that the affairs of science are exclusive to scientists, the academe, and those who study science.

Although science news are yet to headline newspapers on a regular basis, stories about the environment, space technology, plants and animals, and medicine now enjoy their own section in broadsheets. This advent in journalism demands journalists to not just chase after and report science stories but to do so in a laymanized, accurate, and interesting manner. For this, the Department of Science and Technology-Science and

Technology Information Institute (DOST-STII) organized a writeshop for students, particularly on how to write creative and engaging biotechnology stories.

Two seasoned science journalists, Dr. Aristotle P. Carandang, chief of the Communication Resources and Production Division of DOST-STII, and Shaira R. Panela, a freelance science reporter, served as resource persons for the writeshop.

Held on 22 November at Brentwood Suites, Quezon City, the writeshop was done in partnership with the DOST-Philippine Council for Health Research and Development, as part of the 13th National Biotechnology Week from held 20-24 November 2017.

Inspire, engage, convert

When writing science stories, Dr. Carandang suggested that “instead of using Information, Education, and Communication to stand for IEC, try to use verbs instead.” He suggested another acronym for IEC—inspire, engage, and convert—to guide writers in doing their science stories.

According to Dr. Carandang, writers can use their news stories to create interest on the subject among its readers and inspire them. Next step is to engage them with the story in a way that they will be moved to take action or convert them into adopters and advocates of science, technology, and innovation.

“Creating a new mindset is our goal,” he said. Carandang concluded by emphasizing the role of science writers to communicate science to the public “to earn greater support.”



Participants of the writeshop with DOST-STII staff.

What to ask yourself

Humanizing stories is one of the techniques that Panela said she uses in her writing. “Filipinos like stories so you can use stories of farmers and users [of biotechnology products] to engage readers.”

“Readers always ask, ‘What’s in it for me?’” said Panela. Accordingly, the question is usually as important as the “W-H” questions, she said.

Panela also gave three steps in writing news stories: researching which involves investigating reliable sources and interviewing people relevant to the topic; writing which includes translating jargons and making the story “alive and relevant”; and reviewing and editing wherein writers can ask feedback from others.

Other tips she shared included preparing in advance when interviewing experts, following up on the stories you have previously written, and looking for hidden interests.

“Take every opportunity to publish good science stories,” Panela remarked. She ended her talk by encouraging the participants to enjoy the writing experience.



Rapid diagnostic test kit for dengue featured at NBW exhibit

By Sheila Marie Anne J. de Luna, *DOST-STII*
Photo by Allan Mauro V. Marfal, *DOST-STII*

A NOVEL and locally developed dengue diagnostic test kit that can detect the presence of the disease within an hour, was one of the featured products in the 13th National Biotechnology Week exhibit, which was held from 20-24 November at the Expo Hall of Fisher Mall in Quezon City.

Biotek-M™ Dengue Aqua (BMDA) kit, is a rapid test kit for the confirmatory diagnosis of dengue. A team of Filipino scientists from the Institute of Molecular Biology and Biotechnology-National Institutes of Health (NIH) of the University of the Philippines (UP) Manila, led by Dr. Raul V. Destura, developed the technology as part of a UP funded research on dengue prevention.

Dr. Destura, who is associate professor at UP Manila and a research faculty at the UP NIH, formed the startup company Manila HealthTek Inc. in 2014 to distribute the BMDA kit. BMDA kit has been in the market for commercial use since the third quarter of 2016.

In previous interviews, Dr. Destura maintains that the diagnostic kit “will bring the advantage of anticipatory management because of early diagnosis.” Destura believes that the technology would translate to better delivery of healthcare to patients, with doctors being able to manage patients confirmed to have the disease earlier than usual. A delay in

the diagnosis of dengue can sometimes put patients’ lives in danger.

With an early diagnosis of dengue, affected patients can be treated early and immediately, thereby reducing cost on the part of the patients. On the part of hospitals, there will be less patient admissions if patients are diagnosed early, reducing the time patients will stay in the hospital while waiting for test results to come out.

Unlike the other molecular-based dengue diagnostic technologies available in the market today, BMDA kit can produce results within an hour. With the other dengue diagnostic tests, patients need to wait five days within or after the onset of fever before confirmatory dengue test can be administered. With BMDA kit, doctors can rule out dengue quickly without having to admit patients who are suspected of having the illness.

The most commonly used test for dengue diagnosis are the dengue antibody tests and the dengue NS1 antigen capture ELISA test. Biotek-M has proven to be as effective as the Polymerase Chain Reaction (PCR) technology, but less expensive.

However, getting BMDA kit in the market has been a challenge at first because most government hospitals would wait for Department of Health (DOH) recommendations, says Joy Ann

Petronio-Santos of Manila HealthTek Inc. “Even if they would like to use Biotek-M, their budget is dependent on DOH. Now that DOH purchased, it is much easier to market,” says Santos, who is also a university researcher at the Institute of Molecular Biology and Biotechnology-NIH.

The PCR test costs around P7,000-8,000, while the test using Biotek-M™ Dengue Aqua Kit costs only P500. The test kit is now available in the following hospitals: The Medical City, Marikina Valley Medical Center, Marikina Doctors Hospital and Medical Center, Inc, and Vicente Sotto Memorial Medical Center. The major customer is still the DOH, which plans to deploy the kits in 15 hospitals in three provinces, says Santos. These are Ilocos Norte, Capiz, and Zamboanga Sibugay.

Biotek-M uses a variation of the PCR technology, the isothermal PCR method wherein nucleic acid is extracted from the blood and added to the mixture. After an hour, the mixture will turn green if blood is dengue infected, and it will turn orange if negative.

The development of the technology was funded by the Department of Science and Technology-Philippine Council for Health Research and Development (DOST-PCHRD) as part of DOST’s anti-dengue program.

“We are actually developing the next generation BMDA kit that will make the preparation easier, wherein RNA extraction will not make use of the commercially available kits before they can use the BMDA, as it will already be included in the kit,” adds Santos.

The World Health Organization believes that dengue is the most common mosquito-borne viral disease and a major global public health concern. According to the DOH’s Dengue Disease Surveillance Report, 97,287 dengue cases were reported nationwide from 1 January to 30 September 2017, with most cases coming from the following: Metro Manila (16.82 percent), Cebu (7.91 percent), Negros Occidental (4.20 percent), South Cotabato (4.17 percent) and Pampanga (4.16 percent).

The BMDA kit was developed in 2012 as a joint undertaking among DOST-PCHRD and the DOH-National Epidemiology Center, Biotech Manila, and the Philippine Genome Center.



Singapore scientists make breakthrough discovery to treat fibrotic diseases

By Indra Gurung, *Duke-NUS Medical School*

RESEARCHERS FROM Duke-NUS Medical School (Duke-NUS) and the National Heart Centre Singapore (NHCS) have discovered that a critical protein, known as interleukin 11 (IL11) is responsible for fibrosis and causes organ damage. While it is surprising that the importance of IL11 has been overlooked and misunderstood for so long, it has now been very clearly demonstrated by this work.

Fibrosis is the formation of excessive connective tissue, causing scarring and failure of bodily organs and the skin. It is a very common cause of cardiovascular and renal disease, where excessive connective tissue destroys the structure and function of the organ with scar tissue.

“Fibrotic diseases represent a major cause of illness and death around the world. The discovery that IL11 is a critical fibrotic factor represents a breakthrough for the field and for drug development. It is an incredibly exciting discovery,” explained the study’s senior author, Professor Stuart Cook, Director, National Heart Research Institute Singapore.

A protein known as transforming growth factor beta 12 (“TGFB1”) has long been known as the major cause of fibrosis and scarring of body organs, but treatments based on switching off the protein have severe side effects. The scientists discovered that IL11 is even more important than TGFB1 for fibrosis and that IL11 is a much better drug target than TGFB1.

Fibrosis of the heart and kidney eventually leads to heart and kidney failure, thus this breakthrough discovery — that inhibiting IL11 can prevent heart and kidney fibrosis — has the potential to transform the treatment of millions of people around the world.

“Currently, more than 225 million people worldwide suffer from heart and kidney failure and there is no treatment to prevent fibrosis. The team is at the stage of developing first-in-class therapies to inhibit IL11 and this offers hope to patients with heart and kidney disease,” shared Professor Terrance Chua, Medical Director, NHCS.

“This therapeutic target for fibrotic diseases of the heart, kidney and other organs may be exactly what we need to fill the unmet pressing

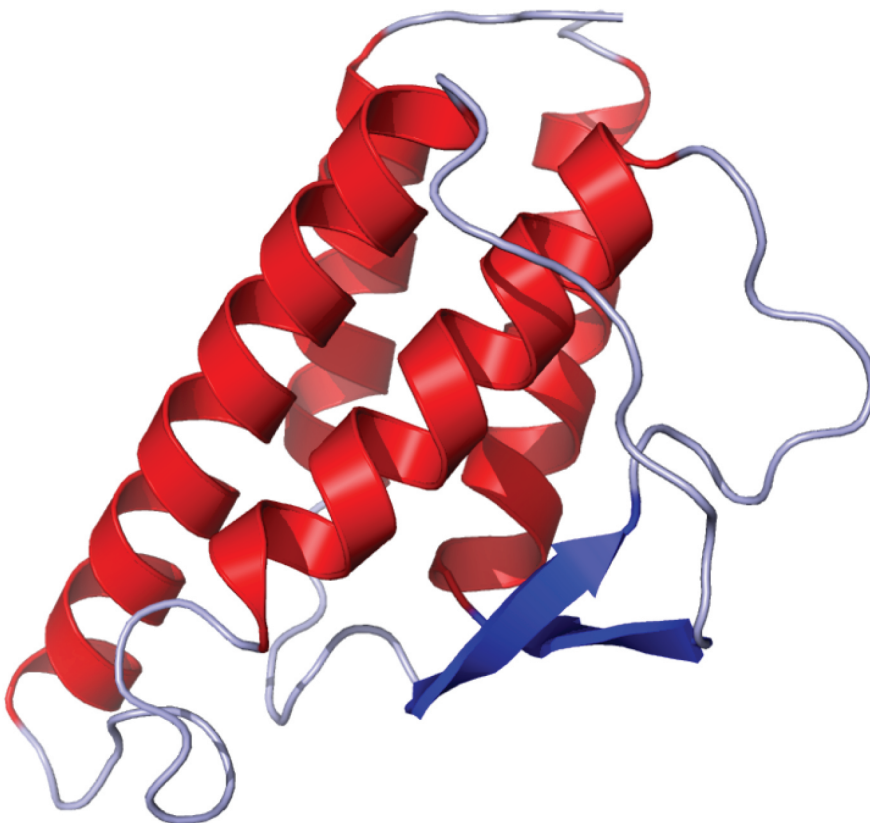
clinical gap for preventing fibrosis in patients. We are proud to announce that the suite of intellectual property arising from this research has been licensed to a newly launched Singapore-funded biotechnology start-up Enleofen Bio Pte Ltd, which is co-founded by Professor Cook and Assistant Professor Schäfer,” said Professor Thomas Coffman, Dean of Duke-NUS Medical School.

The international team, led by Professor Cook, Tanoto Foundation Professor of Cardiovascular Medicine, along with Assistant Professor Sebastian Schäfer, both from NHCS and Duke-NUS’ Programme in Cardiovascular and Metabolic Disorders, carried out the translational research to identify the key drivers of chronic

fibrotic disease in heart, kidney and other tissues.

The team also includes researchers from Harvard University and University of California, San Diego/UCSD (USA), Max Delbrück Center for Molecular Medicine/MDC-Berlin (Germany), London Institute of Medical Sciences/MRC-LMS and Imperial College London (the UK), and the University of Melbourne (Australia).

The research was supported by the National Medical Research Council under its Singapore Translational Research award; the National Research Council Singapore Centre Grant to the NHCS; Goh Foundation; Tanoto Foundation; National Heart, Lung and Blood Institute, UK; Howard Hughes Medical Institute, USA; and the Fondation Leducq.



Interleukin 11
(Image from: fiercebiotech.com)

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 3 October 2017 | Turnover of DOST-Science and Technology Academic and Research-Based Openly Operated Kiosk (STARBOOKS) in collaboration with Department of Education (DepEd) and launching of "Juan Time" campaign in Laoag City, Ilocos Norte.

2 10 October 2017 | Committee Hearing on Space Agency Bill

3 5 December 2017 | After the DOSTkusyon press conference in Kamuning Bakery, a DOST-SETUP beneficiary, the Secretary checked out the famous bakery's "pugon" (traditional oven).



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4 11 October 2017 | Philippine Instrumentation and Control Society National Convention held in Crowne Plaza Manila Galleria Philippines showcased different technologies that may benefit people in their everyday lives.

6 14 October 2017 | New Provincial Science and Technology Center in Kalinga at DOST-CAR.

8 15 December 2017 | At the Makati Business Club Joint Membership Meeting, the Secretary shared the different DOST programs to the private sector.

5 7 November 2017 | The Secretary was keynote speaker at the “Sustaining Chemical Engineering Ingenuity and Breakthroughs Towards a Successful ASEAN Integration” held at the De La Salle University in Manila.

7 7 November 2017 | Secretary Fortunato T. de la Peña was the guest speaker in the “Weaves of Change: Fostering Ties That Bind” at ASEAN TELA Conference of DOST-Philippine Textile Research Institute.

9 18 December 2017 | Grand Launching of Hybrid Electric Road Train in General Santos City.



DEPARTMENT OF SCIENCE AND TECHNOLOGY (DOST) *in cooperation with*
Science and Technology Information Institute (STII) *and*
Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA)

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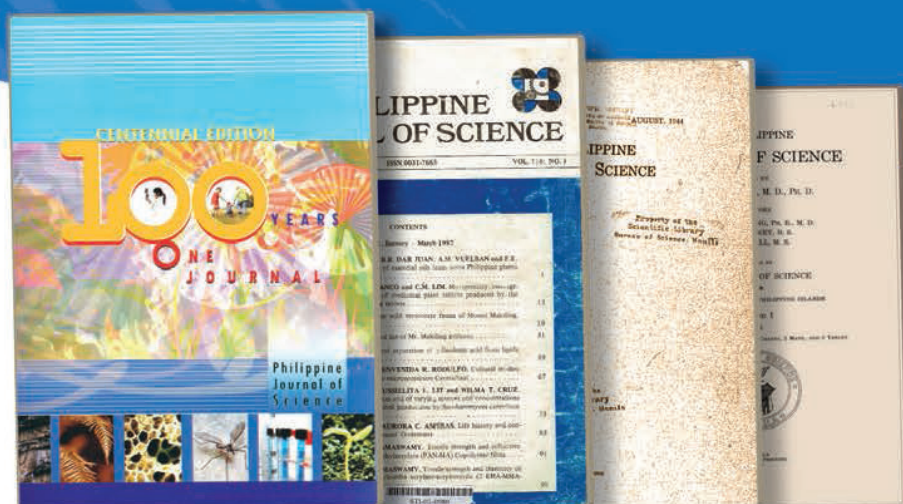
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