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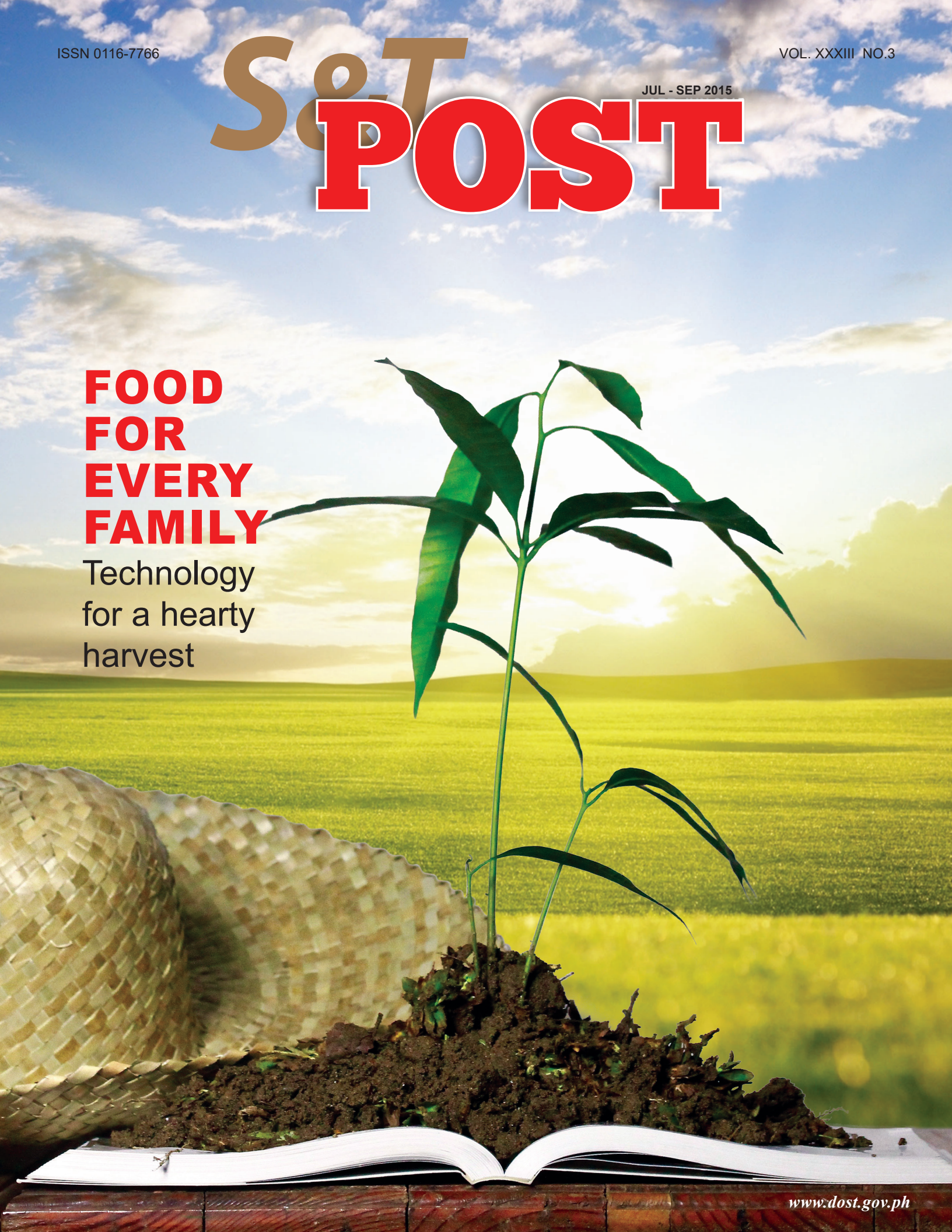
S&T POST

FOOD FOR EVERY FAMILY

Technology for a hearty harvest



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EDITORIAL

Celebrating science in everyday life

Undeniably, the Department of Science and Technology (DOST) has been on its toes in making science and technology all encompassing, ensuring that every Filipino becomes part of its journey towards realizing its vision. This is what we now call *Agham na Ramdam.*

Through Presidential Proclamation No. 169, s. 1993, declaring the third week of July as the National Science and Technology Week (NSTW) (amending Proclamation No. 2214, s. 1982), the law authorizes the DOST to undertake appropriate commemorative ceremonies and activities with the support of other government agencies and the private sector. Each year, the NSTW revolves around a certain theme: Filipinnovation: The Way Forward (2010); Nasa Siyensya ang Pag-asa (2011); Science, Technology and Innovation: Working Together for Growth and Development (2012); Science, Technology and Innovation: The Road to a Smarter Philippines (2013); Philippines: A Science Nation Meeting Global Challenges (2014); and Philippines: A Science Nation Innovating for Global Competitiveness.

True enough, the DOST has been trying to make the NSTW more attractive to Filipinos aged 5 to 95 by making it as colorful as other traditional festivals. With Secretary Mario G. Montejo at the forefront, this forms part of the current administration's paradigm of developing the country's own capacity which has been the guiding policy in all S&T activities, whether it is about developing cost-effective solutions to address the basic needs of the most ordinary Filipinos or providing solutions to everyday problems or even making use of cutting edge technologies. In terms of attendance, total per year has not reached the 20,000 mark since 2010. Only in 2013 did it breach the mark by having about 56,000 participants. Attendees in 2014 reached more than 34,000 while 2015 recorded the most number at 83,000. The number of participants from the private sector also increased while students remain to be on the top spot. The sudden upsurge in 2015 was truly remarkable. Can this be seen as a sign the Department is starting to be felt as envisioned? We can always hope for the best.

Aside from this national event every July, there are also four other celebrations held in geographically important areas in the regions clustered into Northern Luzon, Southern Luzon, Visayas, and Mindanao. The three most recent NSTWs (2013, 2014, and 2015) reached out to various and a bigger number of audiences showcasing S&T in the life of every Filipino while highlighting, at the same time, Filipino innovations in various fields: Agriculture, Countryside Development via MSMEs, Industry, IT-BPM, Government Services, Health and Nutrition, Human Resource Development, and Disaster Preparedness. The focus was on how science is interwoven in everyday life; and presented in different ways and events as exhibits, forums, conferences, bazaars, competitions, technology demonstrations, AVPs, among others. Here, Mang Juan and Aling Maria were the central characters as they represent every Filipino.

In this issue of the S&T Post, the editorial team has decided to feature, once again, stories about the recent NSTW; highlighting developments in agriculture sector or those belonging to Outcome 1. Specifically, this is about science-based know-how and tools that enable the agriculture sector to raise productivity to world class standards. This issue's theme, "FOOD FOR EVERY FAMILY, Technology for a hearty harvest" encapsulates the goals of DOST for Philippine agriculture: to tap science and technology and allow the sector to improve, thrive, and expand, and thus provide food on the table of every Filipino household.

Aristotle P. Carandang, PhD

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

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DEPARTMENT OF SCIENCE AND TECHNOLOGY

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OUR COVER

The DOST has identified agriculture as its Outcome One which highlights several technologies and services that the Department has developed and supported to improve productivity in agriculture, marine resources, and livestock, among others.This issue's cover is a very simple illustration of Filipino farmers (represented by the *buri* hat) making use of technology, innovation, and knowledge (represented by the open book) in agriculture (represented by the soil and seedling) to have an abundant harvest that gives our farmers good income and ensures food for every Filipino family.

Kuala Lumpur
ENGINEERING
science
fair

N NEUTRON
A ACID
E ELECTRICITY
C CELLS
B BACTERIA
M MAGNETIC

An initiative under SCIENCE to ACTION

KLESF

Kuala Lumpur Engineering Science Fair
2015年吉隆坡工程科技与科学展
Pesta Kejuruteraan dan Sains Kuala Lumpur 2015

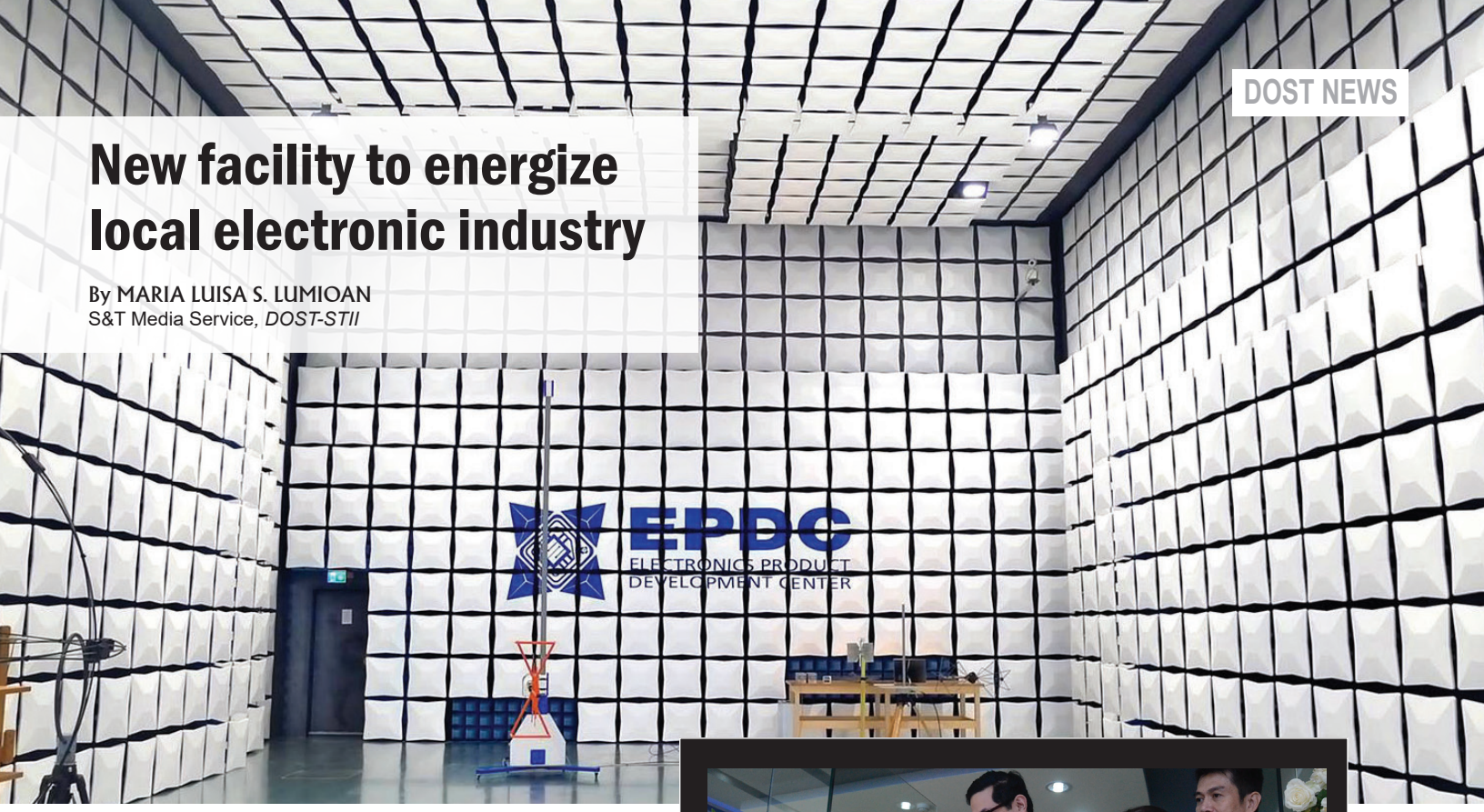
VENUE : Mines International Exhibition and Convention Centre (MIECC)
DATE : 30 October - 1 November 2015
TIME : 9am - 5pm

The Fair 2015

ADMISSION IS FREE

New facility to energize local electronic industry

By MARIA LUISA S. LUMIOAN
S&T Media Service, *DOST-STII*



An echo-free room designed to absorb reflections of sound and electronic waves, this three-meter semi-anechoic chamber for testing of electromagnetic compatibility (EMC) of devices is housed at the newly built Electronic Products Development Center at the MIRDC Compound, DOST Complex, Taguig City. EMC ensures that an electronic device does not cause interference with other devices.

Senator Paolo Benigno "Bam" A. Aquino IV (middle) leads ribbon cutting ceremony for the inauguration of the Electronic Products Development Center with DOST officials namely (from left) Usec. Rowena Cristina L. Guevara, ASTI Director Denis F. Villorente, Usec. Amelia P. Guevara, and Asec. Robert O. Dizon. *(Photo by Gerardo Palad, S&T Media Service)*

THE LOCAL electronics industry is poised to compete in the global market arena with the recent inauguration of the Department of Science and Technology's (DOST) Electronic Product Development Center (EPDC).

Envisioned to push our country from being just an assembler into becoming a designer, manufacturer, and marketer of our own electronic products, the EPDC boasts of cutting-edge technologies that will enable local companies, start-ups and the academe to conduct their research, design, and prototyping of electronic products right here in the country.

Secretary Mario G. Montejo, in a message delivered by Assistant Secretary Robert O. Dizon during the Center's inauguration, said that "this milestone is not only the achievement of the Department but also the success of the whole (electronics) industry."

Meanwhile, Engr. Alex Sy, president of the Electronics Industry Association of the Philippines, Inc. welcomed the initiative."It is about time to seriously look at product design activities especially with competition we could be facing in the upcoming ASEAN integration," he declared.

He explained that companies engaged in product design usually earn more than those that are engaged in subcontracting jobs. The electronics and semiconductor industry is the nation's top exporter, accounting for 41 percent of the total exports. However, Engr. Sy lamented that the industry is mostly dependent on subcontracting jobs which are at the low end of the global value chain.

Engr. Sy hopes that EPDC will encourage more research and development and provide the much needed practical experience for our pool of designers in the country.

The Center houses a Printed Circuit Board Prototyping and Fabrication Facility, a Product Prototyping Facility and a 10-m Semi Anechoic Chamber for Electromagnetic Compatibility and Safety Testing.

The EPDC is under the management of DOST's Advanced Science and Technology Institute, located at the Metals Industry Research and Development Center Compound, DOST Complex, Bicutan, Taguig City.

COA lauds STARBOOKS

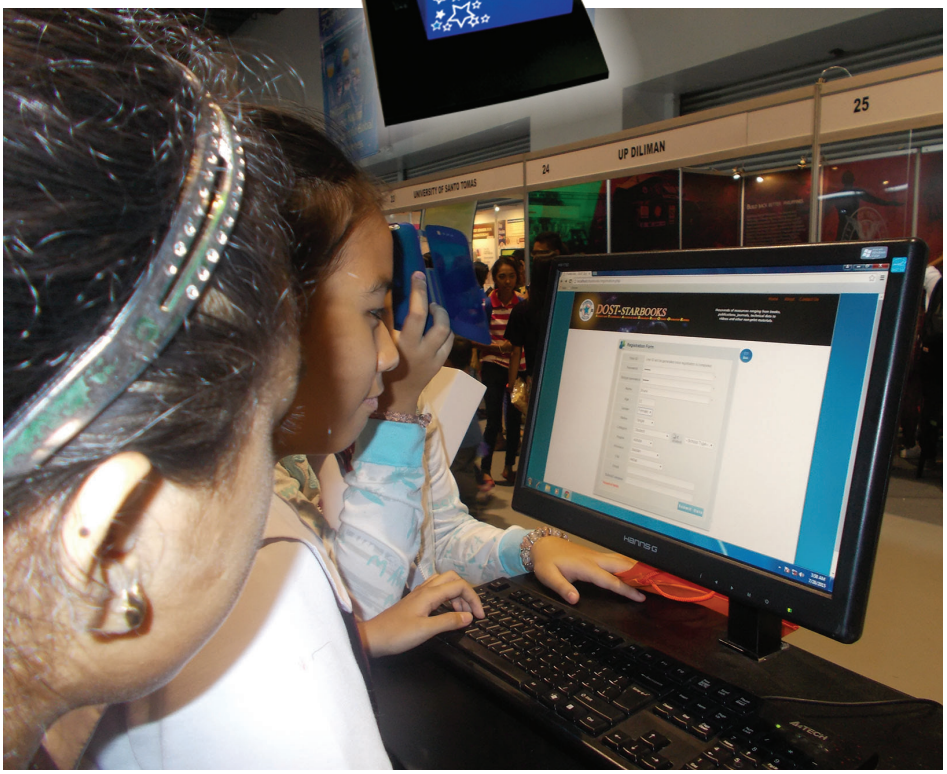
By RODOLFO P. DE GUZMAN
S&T Media Service, *DOST-STII*

THE COMMISSION on Audit (COA) has lauded the Department of Science and Technology's STARBOOKS or Science and Technology Academic and Research-Based Openly Operated Kiosk Station, the first digital science library in the Philippines which can run without Internet connection.

In its final report of 2014, the COA indicated that STARBOOKS is one innovation that merits praise because it provides opportunities to deprived but deserving students in the countryside and gives them access to information on S&T for free.

"Looking at this program, bringing this library to far-flung areas is very noble as far as COA is concerned," stated Karlo Almonidovar, Commission on Audit supervising auditor assigned at the DOST. "The social impact of STARBOOKS is very important because this addresses one of the strategic objectives of the government which is poverty alleviation through education, and we approve of it, that's why COA is called 'partner in development.'"

STARBOOKS is a technological innovation of the traditional library, transforming it to digital format where it contains knowledge products and research materials such as scientific journals, audio-video productions and film clips, tutorials and detailed information on Filipino scientists and inventors and their works. It covers varied topics such as food and nutrition, health and medicine, energy, environment, livelihood technologies, and others.



In 2013, its content was further beefed up by the addition of the Britannica Ultimate Encyclopedia 2013 Edition.

It is a virtual "library in a box" – bridging the technological divide to benefit students with limited access to the internet.

"The STARBOOKS program was conceptualized primarily to provide easy access to S&T information by our students especially in the countryside where we have limited Internet access," said DOST Secretary Mario G. Montejo. "Since this module requires no Internet connection, DOST is able to level the playing field in terms of providing updated knowledge products that otherwise could have been available only to those with financial means."

Recently, the American Library Association (ALA), an international organization of library associations in the United States, took notice of STARBOOKS and conferred the program with the ALA Presidential Citation for Innovative International Library Projects last June 29, 2015 at the International Librarians Reception at the San Francisco Library in San Francisco, California.

"This is the essence of bringing education to far-flung areas. The program is worth pursuing because of its accomplishment as the program has already been distributed nationwide and has gained significant milestones," added the COA official.

As of this writing, DOST's Science and Technology Information Institute, the lead implementing agency for STARBOOKS, has already installed 654 units/kiosks in 69 provinces all over the country (Per COA Annual Audit Report as of December 2014, there were 12 STARBOOKS kiosks established in CAR, Masbate, Negros Oriental and MIMAROPA and 351 for schools, LGUs, provincial S&T centers and public libraries).

Low-cost handicraft dryer helps Japanese designer

By RIZALINA K. ARARAL
S&T Media Service, *DOST-FPRDI*

The low-cost handicraft dryer is a cheaper, safer, and cleaner way for Cavite-based Masaeco to dry its products.

Wataru Sakuma makes world-class decors from handmade paper which in turn comes from agricultural wastes

WATARU SAKUMA, a Japanese designer based in the Philippines, is one of the newest adopters of the Department of Science and Technology - Forest Products Research and Development Institute's (DOST-FPRDI) low-cost handicraft dryer (LCHD).

His company, the Cavite-based Masa Ecological Development, Inc. (Masaeco), is the maker of eco-friendly and world-class handmade paper products made mostly of local agricultural wastes such as pineapple and banana fibers and cogon grass. Sakuma's masterpieces are exported to the US, Europe, Japan and Australia.

"We make around 100 sheets of paper daily, each measuring 250 cm X 100 cm, and we convert these into art panels, wall decors and lamps," says Sakuma.

He reports that his 35-cubic meter LCHD has helped his company to dry its products more efficiently.

Developed by an FPRDI research team led by Wency H. Carmelo, the LCHD uses 22 percent less wood fuel and is 40 percent cheaper to build than the FPRDI furnace-type lumber dryer.

"We now have an easier and safer way of drying paper," reveals Sakuma. "This gives us more control of the process, unlike before when we simply exposed our products to a direct heat source. This was a messy system that made a lot of ash which often soiled our products."

Without the ash problem, the sheets of paper are now cleaner and they have fewer rejects. They also doubled their production, the new dryer being twice bigger than their old one.

"Compared to our old kerosene-fired dryer, the handicraft dryer allows us to save as much as P 60,000 – 70,000 a month on fuel cost," Sakuma adds.

The LCHD is one of several local technologies developed by DOST for industry use. "They are useful, effective and cost-efficient, proof that our local experts have the capability to come up with excellent, world-class products," said DOST Secretary Mario G. Montejo. "A technology such as the LCHD is so efficient and high performing that even foreigners appreciate what our own people have made."

According to the Japanese designer, they found the handicraft dryer so useful that they decided to install another unit this year. "Within the next few years, we will probably need a third one," he relates.

His fresh product designs have earned for the artist the coveted Katha Award in 2005, 2006 and 2009. A highlight of the Department of Trade and Industry's Design Week Philippines, the Katha Award is "given to designers and exporters whose products embody exceptional quality and high-caliber design in furniture, housewares and furnishings, holiday décor and gifts, and fashion."

"Masaeco not only allows me to earn while expressing my artistry," Sakuma shares. "It also allows me to pursue another passion – giving jobs to young people in the provinces."

To know more about the low-cost handicraft dryer and other FPRDI technologies, contact FPRDI at (+6349)536-2586/ 536-2360/536-2377 or email at info@fprdi.dost.gov.ph.

Scholarship program in sync with ASEAN integration

By RODOLFO P. DE GUZMAN
S&T Media Service, *DOST-STII*

THE DEPARTMENT of Science and Technology (DOST) has redefined and beefed up its scholarship program in science and technology courses to address the need of the country to be at par with other APEC economies for the ASEAN integration this year.

APEC, or the Asia-Pacific Economic Cooperation, is composed of 21 countries including the Philippines, United States, Canada, Australia, Russia, Malaysia, Indonesia, Thailand, Singapore, Chinese Taipei and Vietnam. One of the priority concerns of the APEC is education, especially the sharing of science and technology information among the member countries.

At the forefront of this endeavor is the DOST's Science Education Institute (SEI) that oversees the department's programs on scholarship and assistance to students in the field of science and technology. Another program of the DOST is the Philippine Science High School System, the country's premier secondary school in science, math and engineering education.

During the DOST Scholars' Summit held in conjunction with the Science Nation Tour campaign of the DOST in Vigan City recently, hundreds of scholars from the Philippine Science High School in San Ildefonso, Ilocos Sur and other schools were feted by DOST officials led by DOST Undersecretary for Science and Technology Services Dr. Rowena Cristina L. Guevara, Assistant Secretary and Program Manager for Countryside Development Dr. Urduja A. Tejada and DOST Region I Director Dr. Armando Q. Ganal.

"We are at the forefront of enriching our human resource capital by providing quality education to the poorest of the poor in the countryside," said Undersecretary Guevara.

Under the DOST programs there are three main scholarship vehicles, namely: 1) the RA 7687 known as the Science and Technology Scholarship Program, which provides full scholarship to poor and deserving students; 2) Merit Scholarship Program, which provides scholarship for the best students in science and technology and 3) the Junior Level Science Scholarship Program under RA 10612 which provides full scholarship to third year students enrolled in the said fields and are willing to teach in science, technology, engineering, agriculture and mathematics subjects after graduation.

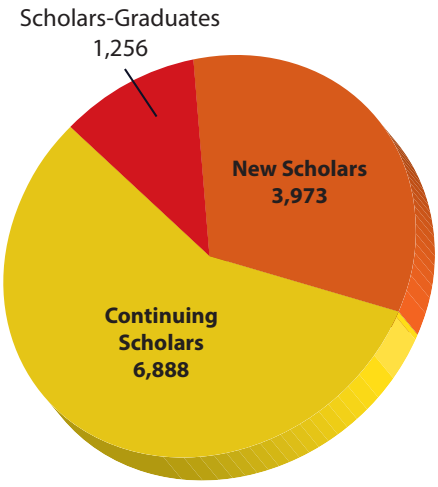
In her presentation to the DOST scholars, Usec. Guevara also said that the number of DOST scholars has dramatically increased over the last five years starting in 2010 under the Aquino administration. Likewise, the total investments for the scholarship programs have increased to allow more scholars to avail more financial aid and opportunities. In fact, there are now 14 Pisay campuses all over the country, including Batangas and Zamboanga as the latest campuses that opened this schoolyear.

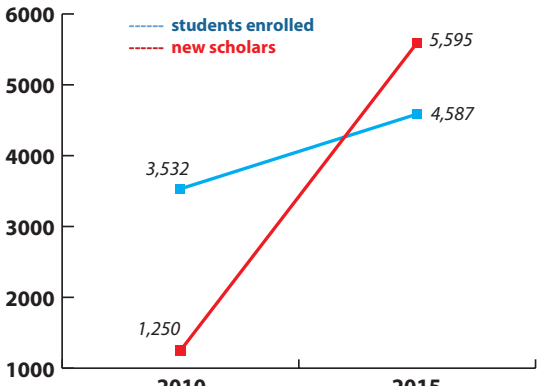
The Philippine Science High School System adopts the One Campus per Administrative Region strategy in line with RA 9036-- targeting 16 DOST - Philippine Science High School (DOST-PSHS) campuses to be established in the country.

Further, with the assistance of lot donors from both private and public entities, the sites for two PSHS Campuses, namely PSHS - Western Mindanao and PSHS-MIMAROPA, have already been identified and are programmed to commence classes this coming SY 2016-2017.

In 2014, a total of 12,117 scholars were supported by these programs composed of 3,973 new scholars, 6,888 continuing scholars and 1,256 scholar-graduates. New scholarship slots have been expanded from 1,250 in 2010 to 5,595 in 2015.

As of SY 2014-2015, the total PSHS System students enrolled have risen to 4,587, from 3,532 in SY 2010-2011.





GRAPHIC: JBI

DOST reps get trained on technology and policy in Korea

By MARIA JUDITH L. SABLAN
S&T Media Service, *DOST-STII*

FOUR REPRESENTATIVES from the Department of Science and Technology were the Philippine's official delegates to the training on technology and policy held in South Korea last March to April. The training, sponsored by the Korea International Cooperation Agency (KOICA) and organized by the Science and Technology Policy Institute (STEPI) in Korea, aims to build the capacity of developing countries by sharing Korea's experience and success in science, technology and innovation policies.

DOST delegates to the Technology and Policy (TAP) training program, (from left) Joseph Escorial from PCIEERD, DOST Region VIII Assistant Regional Director Ernesto Granada and STEPI Visiting Scholar Maria Judith L. Sablan, don the hanbok, Korea's traditional costume during the fellowship day.

Commonly known as TAP, the training provided participants with essential knowledge and understanding about the core elements of science and technology policy formulation, including technology management skills which are significant tools for national development. It likewise provided opportunities to strengthen future cooperation among the participating countries especially in areas of science and technology.

This year, 16 representatives from four countries, namely, Bangladesh, Pakistan, Philippines, and Timor Leste, participated in the program. They visited several government research institutes and universities that played critical roles in advancing Korea to become what it is today - one of Asia's economic giants.

DOST Region VIII Assistant Regional Director Ernesto Granada, a delegate to the technology and policy (TAP) training program, tries out a new technology designed for deaf people during a visit to Electronics and Telecommunications Research Institute in South Korea.

From being an underdeveloped country in the '60s after the devastation brought about by the Korean War, the country has evolved from merely exporting textiles and garments to become a leading exporter of mobile phones, automobiles, and even satellites. Korea's economic advancement was made possible by technological innovation and corresponding enabling policies, and thus can serve as model for participating developing countries like the Philippines.

Visits to various research institutes, universities, and industries including technoparks helped the participants clearly realize the role of science, technology and innovation in the Korean economic development. They likewise witnessed different cutting-edge technologies that are new or still-to-be-released in the market.

The four DOST representatives were Regional Office No. 8 Assistant Regional Director for Technical Services Ernesto Granada, Technology Application and Promotion Institute's Jovito Gonzales, Philippine Council for Industry, Energy and Emerging Technology Research and Development's Joseph Escorial, and Philippine Council for Health Research and Development's Paul Ernest de Leon.

Joseph Escorial said, "I learned a lot about the Korean innovation experience, all of which are important in research planning and coordination."

"We also need to invite relevant sectors in the Philippines to be able to come up with a focused and harmonized research agenda," he added. He is thankful for the chance to participate in the TAP program and the opportunity to experience and enjoy Korean culture.

Meanwhile, Maria Judith Sablan from the Science and Technology Information Institute was on a one-month fellowship at Korea's STEPI to conduct benchmarking study on knowledge management.

In a class of their own:
Kids prove science smarts in Clash of Class

By ESPIE ANGELICA A. DE LEON
S&T Media Service, *DOST-STII*

IT WAS a clash of science smarts alright, but it was no quiz bee inside an auditorium.

Instead of contestants quietly sitting on chairs onstage, ready to answer science questions fielded to them by the quizmaster, competitors huddled around their tables excitedly to create and perform fun, science-based items and experiments amidst Manila Ocean Park's amazing aquatic displays.

Tinkering with everyday materials like sticks, nails, strings, pencils, straws, bond paper, tape, eggs, and others, each team raced against time to prove that their school is the best and that they've got the smarts.

In the end, Baclaran Elementary School Unit II, composed of Princess Diane Daval Santos, Issa Marian Lazatin, Dave Paradela, Cris Miole, Sophia Anamarie Benitez, their teacher Vilma Dames and coach scientist Martha Dealino of UP Diliman's Electrical and Electronics Engineering Institute, emerged as overall winner in the elementary division of "Clash of Class."

Organized by the Department of Science and Technology's Science Education Institute (DOST-SEI) and Philippine Science High School System (DOST-PSHS) in cooperation with Manila Ocean Park, "Clash of Class" was one of the activities during DOST's National Science and Technology Week from July 24-28, 2015.

"We want you to experience that science is not just a subject that is memorized, that science is not difficult, that it is fun. We want to excite you, put a spark in your eyes, and put a smile in your faces whenever you encounter science in your life," SEI Director Dr. Josette T. Biyo told the young participants in her message during the opening ceremony.

Aside from Baclaran Elementary School Unit II, the other competing schools were Antonio Luna Elementary School, Magat Salamat Elementary School, Bagong Tanyag Elementary School, Almanza Elementary School, Bagong Silang Elementary School, Amado V. Hernandez Elementary School, and Manuel L. Quezon Elementary School. Each school or team also included one teacher and a DOST scholar who served as the team's coach scientist.

One of them was Robert Padrina, weather specialist 1 of PAGASA. "Today, we went out of the forecasting center to mingle with kids," he shared. "This is a good opportunity for us to share with them what a scientist's work is all about, instead of just being in the confines of our laboratories."

The games involved poking sharpened pencils into a bag of water without causing it to leak, solving puzzles using tangrams and popsicle sticks, creating a model jellyfish that will not readily sink, balancing 14 nails, pouring five different liquids in a glass to form a Density Tower, keeping an egg from breaking when dropped from a height of five meters, hitting a fixed target using mirrors and a prism, and many others.

"The games were super amazing. They were very easy but super addictive," enthused a participant from Bagong Tanyag Elementary School.

"What I learned from "Clash of Class" is how to enjoy mathematics and science, that it does not have to be hard," said another participant, a Grade 5 student from Almanza Elementary School. "Other kids should also learn math and science so they will understand its importance in our lives."

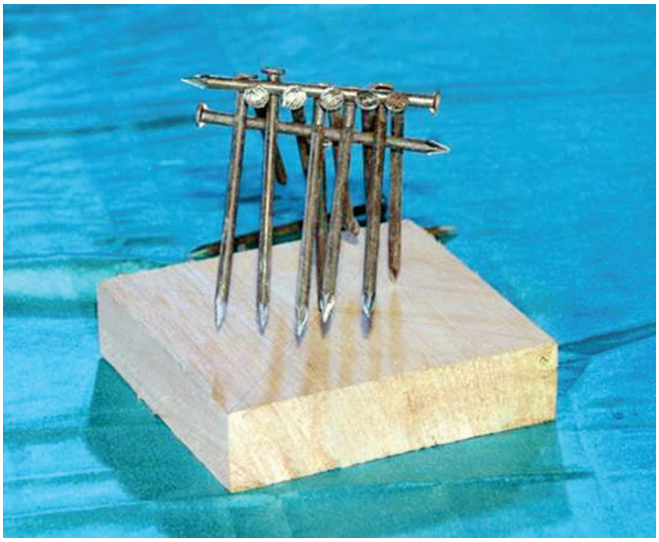
"It was fun and we learned a lot of things, like teamwork and cooperation within a group," shared a Grade 6 student from Amado V. Hernandez Elementary School.

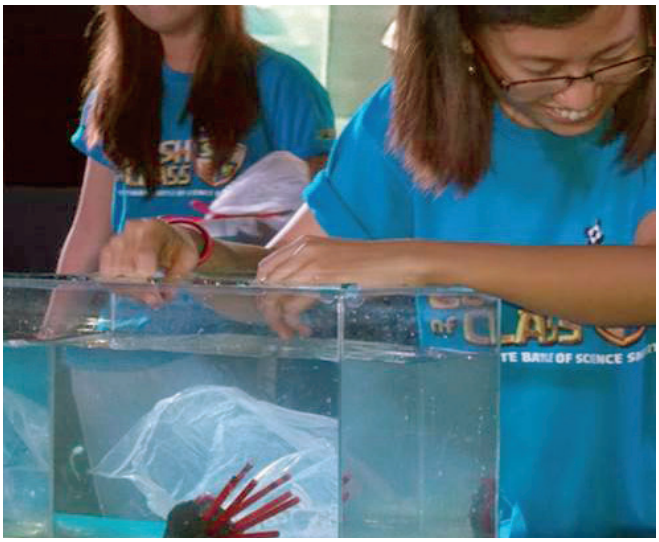
Another participant from Bagong Tanyag also mentioned the value of creativity. "Each one was able to prove his ability to create. If we don't use our creativity, we will not be able to finish each game," he said.

After the elimination round, five teams advanced to the final round, namely Amado V. Hernandez, Magat Salamat, Manuel L. Quezon, Antonio Luna, and Baclaran Elementary School Unit II.

Eventually, Baclaran Elementary School Unit II stamped its class after 10 grueling games which enhanced the students' skills, knowledge, and creativity and set them on the path toward becoming smart scientists which is the objective of "Clash of Class."

Overall champion Baclaran Elementary School Unit II with SEI's S&T Manpower Education Research and Promotion Division Chief Ruby Cristobal (left), DOST Undersecretary for Scientific and Technological Services Dr. Rowena Cristina L. Guevara (right), and Desiree Gestiada of Manila Ocean Park (second from right). *(Photos by Gerardo Palad, S&T Media Service, DOST-STII)*





Gaining a strong second place finish was Magat Salamat while Amado V. Hernandez emerged as the third best team in the annual competition.

Baclaran Elementary School Unit II teacher Vilma A. Dames revealed that prior to "Clash of Class," their principal's advice to them was simple: You have nothing to review, you just have to enjoy and do your best.

The team members, who dream of becoming either doctors or engineers someday, did not expect to win, which made their victory even sweeter.

"We are happy that we placed first and that we will also become DOST scholars someday," remarked Issa Marian Lazatin who is in Grade 6.

Coach scientist Martha Dealino summed it best however. "Our victory is just a bonus," she claimed. "Our real victory is knowing that the kids enjoyed the experience and that it ignited their passion for science and technology."

In the high school division, "Clash of Class" was won by Pasay City East High School composed of Rachel R. Maculi, Mark Joshua Lorico, Rhicalline Pabro, Sean Troy Ros, Jesie Dhiocane Petalio, teacher Raquel Besmano and coach scientist Andrea Adorna, a chemist from DOST's Philippine Textile Research Institute.

In her message, Biyo expressed DOST's hope that the youngsters will eventually be the next wave of DOST scholars and the next breed of scientists and engineers who will provide solutions to many of the country's pressing problems.

CEST, a solution to poverty – Gina Lopez

By LOTUSLEI P. DIMAGIBA
S&T Media Service, *DOST-STII*

GINA P. Lopez, managing director of ABS-CBN Lingkod Kapamilya Foundation, singled out a Department of Science and Technology (DOST) program for community empowerment as a way to get the Philippines out of poverty.

Dubbed as Community Empowerment through Science and Technology or CEST, the program aims to empower the poorest and most depressed communities in the country, via S&T interventions in health and nutrition, water and sanitation, basic education and literacy, livelihood/economic enterprise development, and disaster risk reduction and climate change adaptation.

"We can get our country out of poverty," said Lopez during the CEST Forum, one of the events during the 2015 National Science and Technology Week at the SMX Convention Center in Pasay City last July 27.

But, she added, "I need the help of DOST."

Lopez shared the story of how the foundation invested on and developed Ugong Rock, a site in Brgy. Tagabinet, Puerto Princesa City, Palawan which features a spectacular 18 million year-old rock formation. The group developed it into a tourist attraction, with a zipline and caving adventure that propelled it into one of the must-see destinations in the city.

These developments turned what was once a poor community into what is now a major tourist attraction that brought livelihood opportunities to the people, thus elevating their quality of life. From an annual income of P 133,800 in 2009, their income improved, reaching up to 30 million by 2014.

"Ang goal nila ay alisin ang kahirapan sa buong barangay, sa buong munisipalidad (Their goal is to eliminate poverty from the whole barangay, the whole municipality), and I'm going to do that with DOST," Lopez said in the forum. "That is why I'm here because we're going agriculture, and agriculture alone is not going to do it. We need value added. We need science and technology if we want to go into processing."

Providing equipment for food processing is just one of the many activities undertaken under CEST.

The others are supplementary food feeding program, distribution and utilization of clay water filters, deployment of Ovicidal/Larvicidal (OL) traps for dengue prevention, establishment of municipal-based weather forecasting system and early warning system through the installation of LiDAR (Light Detection and Ranging) and automated rain gauge, water hyacinth production development, installation of DOST's Science and Technology Research-Based Openly-Operated Kiosk System or STARBOOKS in schools, assistance to MSMEs through DOST's Small Enterprise Technology Upgrading Program or SETUP, packaging and labeling, and various trainings.

"Because every community has a story and every CEST model community is a work in progress all over the Philippines, we have now 79 CEST communities, where appropriate, reliable and timely S&T intervention can serve as bridging point in improving the lives of the people in the community," said DOST Secretary Mario G. Montejo in a message read by DOST Usec. for Regional Operations Dr. Carol M. Yorobe during the forum. "With CEST, DOST is able to build more active, sustainable and smarter communities nationwide," Montejo added.

Aside from Lopez, Mayor Enrico Z. Caping of Aroroy in Masbate, Joseph A. Centino of Northern Samar, and Mayor Jasmin F. Monton of Jabonga, Agusan del Norte also shared their experience and successful implementation of CEST which was established in response to President Benigno S. Aquino's National Program on Poverty Alleviation.

According to Mayor Caping, DOST provided several equipment for their food processing facility in Aroroy, which eventually helped in the community's livelihood and enterprise development. "Now, they're earning on their own; they don't receive salaries from the municipality. They help one another," he said.

"If there is no teamwork, lives will not progress," Lopez added.

High schoolers' creative juices flow in poster contest

By ROMELIE JANELLE MARANAN
S&T Media Service, *DOST-STII*

Winners of the Likhang SIPAG On-the-Spot Painting Contest: (From left) first place winning entry by Jestoni Albarillo Rubantes, second place winner by Yanicko Sydbourne Covar, and third place winner by Princess Dianne D. Sabino.

Jestoni Albarillo Rubantes of Pasay City West High School works on his winning entry.

HIGH SCHOOL students from around Metro Manila and Laguna took part in the Likhang SIPAG On-the-Spot Poster Making Contest of the Department of Science and Technology- Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (DOST-PCAARRD) during the last day celebration of the 2015 National Science and Technology Week (NSTW).

Now on its second year, the contest aims to dramatize the linkage between the science and technology (S&T) sector and education sector in achieving a strong S&T-based agri-economy.

Using only water-based paints as medium, the artworks revolved around the theme Strategic Industry Program for Agri-Aqua Growth, focusing on PCAARRD's role to provide science-based know-how and tools that enable the agriculture, aquatic, and natural resources sectors to raise productivity to world-class standards.

Jestoni Albarillo Rubantes of Pasay City West High School won first place with his painting depicting PCAARRD's commitment to raise the productivity of agri-aqua- natural resources sectors.

Second and third place went to Yanicko Sydbourne Covar of Southbay Montessori School in Sta. Cruz, Laguna and Princess Dianne D. Sabino of St. Louis College of Valenzuela respectively.

Covar's work depicts the value of cooperation in achieving science-based knowledge and making it work for economic development while Sabino's presents S&T's role as an important ingredient in the country's success in the field of agriculture and fisheries as it allows the country to double food production and provide farmers and fisherfolk with additional income.

The entries were evaluated according to originality, relevance to the theme, creativity, and execution. Winners received cash prizes and certificates of recognition.

Librarians get more engaged with STARBOOKS

By ESPIE ANGELICA A. DE LEON
S&T Media Service, *DOST-STII*

ACCORDING TO Department of Science and Technology (DOST) Asst. Secretary Raymund E. Liboro, librarians will no longer be the typical detached person inside the library with STARBOOKS around.

Instead, more students and library users will approach and rely on them for information they need from a technology such as STARBOOKS, or Science and Technology Academic and Research-Based Openly Operated Kiosk Station, the first science digital library in the Philippines.

Liboro made this statement during the STARBOOKS Convention, one of the activities in the 2015 National Science and Technology Week.

Developed by DOST's Science and Technology Information Institute (STII), the internationally recognized STARBOOKS is user-friendly and may be accessed without Internet connection. It contains local and foreign S&T resources in text, video, and audio formats including journals, investigatory materials, and livelihood videos. The materials cover a diverse range of topics, from food and nutrition, health and medicine, energy, to environment, livelihood technologies, and many others.

"Librarians hold the key to this information in STARBOOKS, which continues to increase," said Liboro at the Convention, encouraging the librarians to learn how to navigate through its contents and be familiar with the information contained in it. Knowing its contents, Liboro said, will allow them to readily recommend to students and teachers the appropriate materials and sources they need and which they can easily access in STARBOOKS.

In 2013, STARBOOKS gained an ace up its sleeve by acquiring Britannica Ultimate Encyclopedia.

The project marked another milestone in July 2015 when it inked a partnership with the National Library of the Philippines (NLP). The signing of the Memorandum of Understanding between DOST and NLP, represented by Assistant Director Yolanda E. Jacinto, was the highlight of the STARBOOKS Convention which was attended by officials and staff of STII and NLP, librarians, and library operators.

Under the partnership, select pilot municipal libraries will boost their resources with the addition of STARBOOKS with NLP content into their collection, thus making these extensive materials more accessible to more Filipinos, including students.

"That is why we developed STARBOOKS, to make S&T information more accessible to students," said DOST Secretary Mario G. Montejo. "We want to encourage our students to take up courses in S&T because we believe that to achieve inclusive growth we need to strengthen and beef up the pool of scientists, engineers, programmers that we have today."

The pilot municipal libraries are located in Quezon City, Manila, Pasig, Marikina, Malabon, Navotas, Las Piñas, Makati, Taguig, Tondo, Mandaluyong and Pateros.

"Library system as a platform is evolving. Digital is the way to go," Liboro told the audience.

In 2015, STARBOOKS earned the nod of the international community when it was awarded with the American Library Association Presidential Citation for Innovative International Library Projects last June 29, 2015 at the International Librarians Reception at the San Francisco Library in San Francisco, California.

Meanwhile, Liboro announced at the Convention that Filipinos can now look forward to SUPER STARBOOKS.

SUPER STARBOOKS, he said, will contain some 20,000 livelihood materials, including 120 full-length livelihood videos on "how to make longanisa, chicharon, and a lot more," said Liboro.

For more information about STARBOOKS, email dost.starbooks@gmail.com or starbooks@stii.dost.gov.ph.

Undergrad scholarship slots more than triple in 2015 – Montejo

By ESPIE ANGELICA A. DE LEON
S&T Media Service, *DOST-STII*

DOST Secretary Mario G. Montejo

DOST scholar Ernest Nathan L. Nogales, summa cum laude graduate from UP Diliman with a degree in BS Chemical Engineering (middle), and his parents with (from left) DOST Usec. Dr. Rowena Cristina L. Guevara, DOST Sec. Mario G. Montejo, and DOST-SEI Dir. Dr. Josette T. Biyo (far right). *(Photos by Gerry G. Palad, S&T Media Service)*

THE NUMBER of slots for undergraduate scholarship offered by the Department of Science and Technology (DOST) under its Science Education Institute (SEI), has more than tripled in five years, jumping from 1,250 in 2010 to 5,595 in 2015.

"We're also now preparing the groundwork for recruiting new partner universities and introducing innovations into the program for us to expand by 100% in 2017, on our way to meet the required critical number of scientists," stated DOST Secretary Mario G. Montejo in his keynote speech at "In Touch with Excellence," one of the events during the National Science and Technology Week.

In addition, DOST is now producing an average of 350 Master's and 35 PhD graduates in priority science and engineering courses annually.

"Since 2010, we have been strengthening and enhancing our S&T ecosystem, an ecosystem that empowers our scientists and engineers to come up with innovative ideas to improve productivity, enhance delivery of government services, and address the most pressing concerns of Aling Maria and Mang Juan," said Montejo during the event which feted DOST scholars who achieved academic excellence in schoolyear 2014-2015.

According to the Science Secretary, the most critical component of this ecosystem is its human resources, and their number is critical for the Philippines to become a Science Nation able to sustain its development.

"You are blessed with intelligence," Montejo said, addressing the scholars in the audience. "It's only proper to use this God-given intelligence to explore and understand nature. Whatever God created in nature is for our benefit. Let us use this for our country's own good."

Meanwhile, Ernest Nathan L. Nogales, a scholar who graduated summa cum laude from UP Diliman with a degree in BS Chemical Engineering and one of the honorees, rallied his co-DOST scholars to "think about serving the people, not out of duty but out of love. I assure you there is lasting happiness there."

In his speech, Nogales reminded them that some areas in the country remain marginalized – with no electricity, among others.

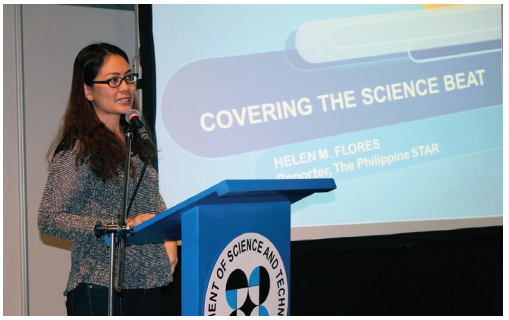
On the other hand, DOST Undersecretary for Scientific and Technological Services Dr. Rowena Cristina L. Guevara called on the scholars to venture in entrepreneurship while completing their dissertation or thesis.

Around 239 undergraduate, MS, and PhD scholars under SEI's various scholarship programs were honored this year for their academic achievements in "In Touch with Excellence" held at the Philippine International Convention Center.

For more about the scholarships, log on to www.sei.dost.gov.ph and www.science-scholarships.ph

Studes get trained in disaster preparedness reporting

By ALLAN MAURO V. MARFAL
S&T Media Service, *DOST-STII*



DZRH radio anchor and Philippine Science Journalists Association President Angelo B. Palmones speaks to student participants of the Department of Science and Technology-Science and Technology Information Institute's (DOST-STII) writeshop for science journalists during the National Science and Technology Week. *(Photos by Ceajay N. Valerio, S&T Media Service)*

AS PART of this year's celebration of National Science and Technology Week (NSTW), the Department of Science and Technology's Science and Technology Information Institute (DOST-STII) conducted a writeshop for campus science journalists and mass communications students to mold a new breed of science communicators in the Philippines.

"The Art in Science Journalism Writeshop" held last July 25, 2015 at SMX Convention Center in Pasay City gathered communications students, campus paper journalists, and professors from different educational institutions, mostly in Luzon.

It covered print and online journalism with focus on disaster preparedness information. Participants were given the chance to engage in writing exercises involving typhoon and earthquake bulletins, and be critiqued by professionals in the industry. They were GMA News Online SciTech Editor Timothy James Dimacali and Philippine Star's Helen Flores.

"We are aware that many science journalists do not have degrees in the scientific disciplines they cover," said DOST Assistant Secretary Raymund E. Liboro in his opening message. "Regardless of background, though, it is always good practice for all science journalists to formulate and answer deceptively simple questions such as 'What does this mean to Mang Juan and Aling Nena?,' because they can go a long way in developing useful material for their respective readers."

According to Dimacali, the solution is "to use an analogy or metaphor to help make it understandable."

Meanwhile, Flores, who has been covering DOST's PAGASA for almost a decade, said that science journalism has already evolved in recent years.

"In the past, they just mentioned LPA, thunderstorm, and storm surge in their reports," she said in her presentation. "Now, they explain specifically what it means and how it will affect the life of the readers."

Flores added that this has resulted to a scenario wherein even young children can understand what an LPA or thunderstorm are and their possible hazards.

Meanwhile, DZRH radio anchor and Philippine Science Journalists Association President Angelo B. Palmones gave an overview of science journalism before the start of the talks and the writeshop proper.

"If S & T consciousness could reach the grassroots, the process of development could be achieved. That is the role of science journalists," said Palmones.

The writeshop was attended by approximately 230 students and advisers from about 28 schools around Metro Manila and neighboring regions.

DOST, DOH to scale up eHealth innovations for inclusive health

By MARIA LUISA S. LUMIOAN
S&T Media Service, *DOST-STII*

THE DEPARTMENT of Science and Technology (DOST), through its Philippine Council for Health Research and Development (PCHRD) in partnership with DOH and other institutions, will deploy at least 100 more RxBox devices by the end of 2016.

This was revealed in the second eHealth Summit held during the National Science and Technology Week celebration.

RxBox is a device with built-in medical sensors capable of storing data in an electronic medical record, transmitting health information via the Internet upon the consent of the patient, and facilitating tele-consultations.

The deployment of the devices aims to help promote inclusive health or equitable access to quality healthcare by all Filipinos regardless of socio-economic status. The move is part of DOST's efforts to expand ICT-based innovations in health or eHealth, in a bid to broaden and improve access to healthcare services and real-time health information for better decision-making.

"I am convinced that eHealth can address our challenges in accessing healthcare services and accessing real-time information for decision making. In my travel especially in island provinces, I saw how RxBox can help both patients and health workers. The benefits are enormous and beyond healthcare," DOST Secretary Mario G. Montejo attested in his message for the Summit which was delivered by PCHRD Executive Director Dr. Jaime C. Montoya.

Currently, RxBox devices are deployed in 115 health centers all over the country.

Another eHealth innovation supported by DOST, the Philippine Health Information Exchange (PHIE) is also set for full implementation by 2016.

PHIE aims to harmonize data records from hospitals to ensure that accurate and timely health information is available to both health practitioners at point of service and decision makers for more effective and efficient provision of health services.

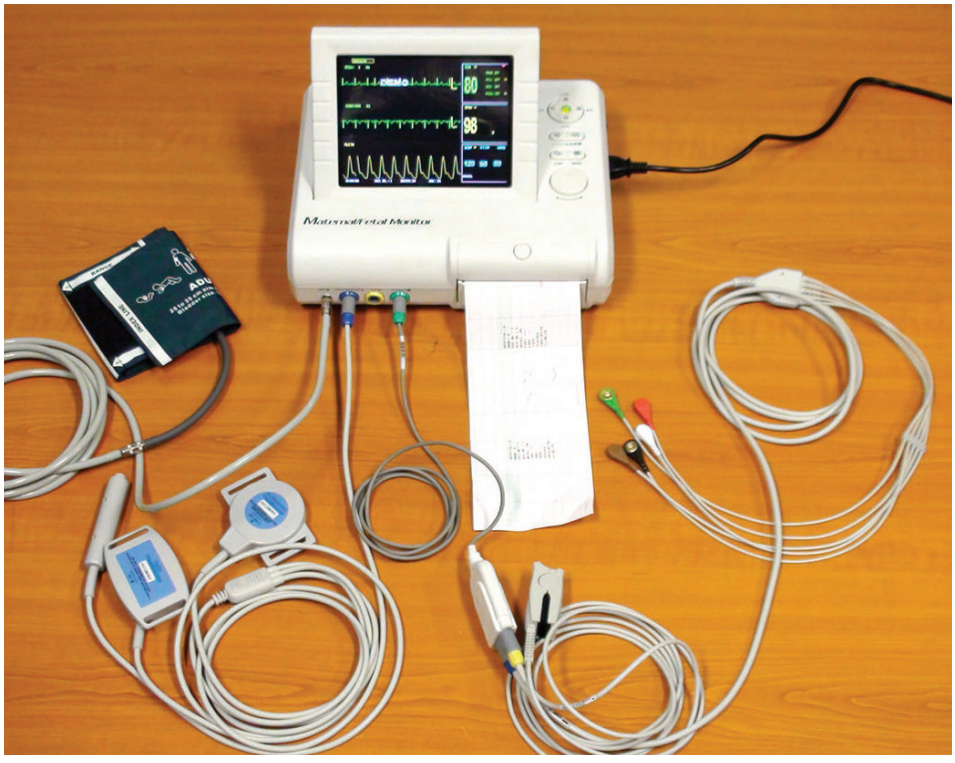
PHIE will also help avoid duplication of treatments and eliminate redundant and unnecessary tests for patients seeking treatment from different hospitals.

"The PHIE is envisioned to become an integral component of healthcare delivery system as a platform where health facilities and healthcare providers can communicate and interoperate to provide better and real-time healthcare services to our citizens," said DOH Secretary Janette P. Loreto-Garin in her message read by Undersecretary Dr. Vicente Belizario, Jr.

Such eHealth innovations change the way information is collected, processed, and accessed to plan, manage, deliver and monitor health services, according to Dr. Garin. From the traditional practice of paper form transactions and manual reporting, the country is moving toward automated yet integrated processing and aggregation of data and information in electronic databases, thereby allowing the information to be searchable, accessible, usable, and actionable.

As of press time, 85 hospitals are already inputting their data into the PHIE registries.

The PCHRD and Ateneo de Manila University have also started rolling out eHATID LGUs or eHealth Tablet for Informed Decision Making of Local Government Units, an android application in a tablet that provides health information and decision-making support to LGUs through an electronic medical record that generates particular health reports for the DOH and Philippine Health Insurance Corporation. For 2014-2015, the project will deploy the eHATID to 450 cities and municipalities nationwide.



The Rx Box

Cocolisap hotspots fall

By LOTUSLEI P. DIMAGIBA
S&T Media Service, *DOST-STII*

FROM THE previous number of 57 cocolisap hotspot areas, only seven remain in the Philippines as of December 2014.

"Our latest report is that, in fact, there are no more hotspots in CALABARZON and the remaining problem is only in Basilan," stated Philippine Coconut Authority (PCA) Administrator Romulo N. Arancon Jr. during the recent Agri-Aqua Forum by the Department of Science and Technology's Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (DOST-PCAARRD).

The forum was one of the activities during DOST's 2015 National Science and Technology Week.

Cocolisap, or coconut scale insect (CSI), possesses specialized mouthparts for sucking the sap directly from the tree's vascular system. This causes yellowing, wilting, premature nutfall, and eventually, low coconut yield.

According to PCAARRD Acting Executive Director Dr. Reynaldo V. Ebora, CSI has created devastating damages to coconut farmers in CALABARZON and Basilan in Mindanao.

"About 2M trees were infested with varying degrees. Some almost died and are hopeless to recover, while others can still survive if properly handled," said Ebora.

A science-based Integrated Pest Management Protocol (IPM Protocol) against CSI contributed to this positive development. The IPM Protocol has several components namely, leaf pruning and harvesting, trunk injection, organic spraying, mass production of biological control agents, establishment of quarantine checkpoints, and surveillance and quick response.

"By zeroing in on science and using cutting-edge technologies, we can find solutions to this problem," said DOST Secretary Mario G. Montejo.

In 2014, a total of 1,660,756 CSI infested trees were leaf pruned in CALABARZON and Basilan and 158,800 in Batangas were fertilized as of March 2014. Meanwhile, 1,548,528 CSI infested trees were trunk injected with systemic insectide (Dinotefuran) in CALABARZON and Basilan while 686,848 were sprayed with organic pesticides.

Overall, P 177 M was spent for the treatment of CSI-infested trees in 2014.

In 2015, 559,652 CSI infested trees have been leaf pruned in CALABARZON and Basilan, 545 have been treated via trunk injection in Sampaloc, Quezon, while 1.3 M trees in CALABARZON are targeted for fertilization this year.

According to Arancon, concerted efforts of the national government, LGUs, PCAARRD, DA, PCA, UPLB, National Crop Protection Center (NCPC), Regional Crop Protection Center, Bureau of Plant Industry, and the coconut farmers, led into the establishment of the Protocol.

"There are protests from organic advocates against the use of pesticide in trunk injection. Some of the farmers are doubting the effectiveness of the IPM Protocol," Arancon noted. "But despite these criticisms, we have to bite the bullet and trust science."

Both Arancon and Ebora admitted that the scourge of the cocolisap cannot be completely eliminated but it will be managed effectively.

Declaring PCAARRD's willingness to support other approaches which address the cocolisap infestation, Ebora stated, "We [will] continue to encourage our scientists to search for more effective and safe technologies and strategies to manage CSI infestation. Let us all work together, to revive our coconut industry and help uplift the lives of our coconut farmers."

Various research studies on CSI and how to manage it are continuously being conducted by UPLB, NCPC and PCA and funded by PCAARRD.

Rejano's Bakery wins SETUP Packaging awards

By LOTUSLEI P. DIMAGIBA
S&T Media Service, *DOST-STII*

REJANO'S BAKERY emerged with back to back victories as it grabbed the Department of Science and Technology's (DOST) 2015 Best SETUP Adoptor Award and MSMEs Packaging Innovation Award during the SETUP Forum at the National Science and Technology Week.

SETUP, or Small Enterprise Technology Upgrading Program, is one of DOST's leading programs for micro, small and medium enterprises (MSMEs) in the Philippines. It aims to provide financial assistance and encourage MSMEs to adopt technological innovations for the improvement of their products, process and operations to boost their productivity and competitiveness. A SETUP adoptor is any MSME which has availed assistance from SETUP.

Rejano's Bakery bagged the regional Best SETUP Adoptor Award for MIMAROPA, earning for the bakeshop an automatic berth to the nationwide competition.

The other regional winners were Keroobee Farms of CAR, Ressteel Construction of Region I, Base Wood Products of Region II, Mom's Haus of Mushroom of Region III, Starwood Manufacturing Company, Inc. of NCR, Riclet Engineering of Region IV-A, Prima General Merchandise of Region V, Filbake Food Corporation of Region VI, Vircap Light Metal Industries of Region VII, Ormoc Marmercury Hardware and Allied Services Inc. of Region VIII, Marc's Balut of Region IX, McAlba Foods Corporation of Region X, Tagum Golden Foods of Region XI, Tecuala Mini Sawmill and Wood Works of Region XII and Guerta Enterprises of CARAGA Region.

Following Rejano's Bakery as finalists were Keroobee Farms and McAlba Foods Corporation.

Meanwhile, the two other finalists for the MSMEs Packaging Innovation Award were Chocovron Global Corporation of Region IV-A and Javier's Instant Salabat Producers Association of Region VIII.

Rejano's Bakery owner Carmelita Rejano-Reyes expresses joy as she receives the plum prize.

McAlba Foods

Keroobee Farms *(Photos by Henry A. de Leon, S&T Media Service)*

"DOST-SETUP has really been such a huge help. Our business has grown tremendously, earning more than 10 times its previous earnings prior to SETUP's assistance," said Rejano's Bakery owner Carmelita Rejano-Reyes during the awarding ceremony.

Reyes assured the Department that she will help in the promotion of SETUP in order to reach out to more MSMEs around the country.

FREE WI-FI LAUNCH Secretary Mario G. Montejo (2nd from right), Undersecretary Louis Napoleon Casambre (leftmost), ICT Office Deputy Executive Director Nicholas D. Ojeda, Jr. (rightmost), together with honorable Senator Ralph Recto (2nd from left), press a button symbolizing the official launch of Free Wi-Fi Internet Access in Public Places project during the National Science and Technology Week (NSTW) last July 24, 2015. The project targets to provide Internet connectivity services in 967 Class 3, 4, 5, and 6 municipalities and key cities nationwide. This will be made available in public places such as parks, plazas, schools, rural health units and government hospitals. DOST believes maximizing the tons of opportunities on the web could play a vital role in speeding up economic progress, specifically in the underserved and unserved areas. According to ICT Office, the Free Wi-Fi Internet Access in Public Places Project aims to connect 99% of the Philippines by second quarter of 2016.

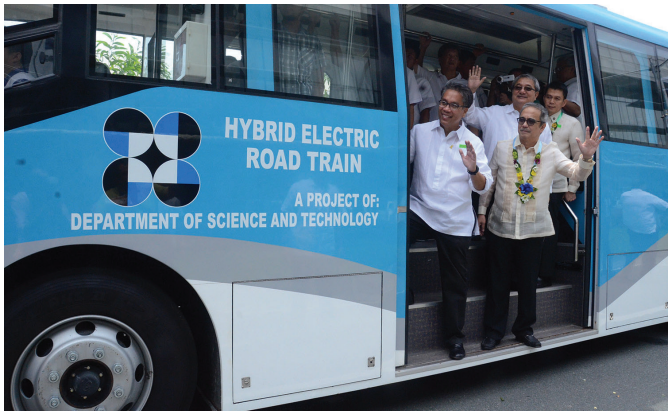
TSUNAMI WATCH Students enjoy learning the concept of a tsunami through an interactive scale model representation displayed at the Disaster Management and Climate Change exhibit area.

A VIEW TO AN ERUPTION Students view the scale model of a volcano "spewing" smoke. The volcano scale model is among the biggest attractions at the NSTW.

ROBOTICS Department of Science and Technology (DOST) Undersecretary Rowena Cristina L. Guevara interacts with students from Philippine Science High School-Cordillera Campus during the Science and Robotics Interactive Exhibits at the National Science and Technology Week recently held at the SMX Convention Center in Pasay City. On display are a remote controlled vehicle (far side of the table), a color sorter (middle) and a sun tracker, all of which were created by the students. The color sorter has a possible real life application in agriculture, specifically for sorting ripe and unripe fruits. (Right photo) One of the students holds a flashlight above the sun tracker to demonstrate how it works. Always facing the strongest source of light, the sun tracker can be used in solar panels to maximize the sun's energy. *(Photos by Henry A. de Leon, S&T Media Service)*

ROBOTS FOR KIDS, BY KIDS

Robots such as these were the main attractions in the Robotics and Science Interactive Exhibit. Students from PSHS campuses all over the country showed off their own robotic creations like this bot and performed interesting science experiments for the audience, consisting mostly of kids.



DOST SCIENCE WEEK TOUTS HYBRID ROAD TRAIN

Department of the Interior and Local Government Secretary Mar Roxas joins Secretary Mario Montejo aboard the proudly Pinoy-made Hybrid Electric Road Train for a short road test on opening day of the 2015 National Science and Technology Week (NSTW) at SMX Convention Center in Pasay City. Designed and constructed by engineers from DOST's Metals Industry Research and Development Center, the Road Train was developed in response to today's mass transportation dilemma. Roxas and Montejo discussed possible deployment of the vehicle in EDSA, Roxas Boulevard, Taft Avenue, and Quezon Boulevard. The road test was followed by free demo rides for the public, attracting throngs of excited passengers. Made up of five interlinked, airconditioned coaches estimated to serve 650,000 passengers a day when rolled out, the Road Train was one of the biggest attractions of the event *(Photos by Ceajay N. Valerio, S&T Media Service)*.

SEARCHING FOR THE STARS

A student tries out a refractor telescope used by DOST-PAGASA astronomers in observing celestial bodies.

VALLEY FAULT SYSTEM ATLAS

A PHIVOLCS personnel explains to exhibit goers the features and the concept behind the Valley Fault System (VFS) Atlas. Launched by PHIVOLCS and distributed to local government officials, the VFS Atlas is a handbook of large-scale maps showing in detail the various places traversed by the active Valley Fault System in Metro Manila.

DIGITAL INTERACTIVE BOARD

A student inscribes messages on a digital interactive board using only her finger at the exhibit area of the DOST- Philippine Science High School System. The interactive board is equipped with sensors, allowing people to "write," and "delete" what was written, by simply whipping their hands through the board. It is among the innovative technologies developed by Philippine Science High School students.

HANDLOOM WEAVING MACHINE LEVELS UP

The traditional handloom weaving machine sports a new and sleek design as modified by the Department of Science and Technology's Philippine Textile Research Institute (DOST-PTRI) using a mixture of metal and wood that makes it more efficient in weaving the web of life using natural dyed fibers from abaca, banana and other plant materials.

What people say about

STUDENT
Infant Jesus Montessori Center
"Nakita ko pong maganda yung facilities pati mga inventions ng mga kalahok. Pinaka nagustuhan ko 'yung robot po."

ADRIAN GO
Adamson University
"There are lots of fields that can be found here – chemistry, physics, engineering. I can say that there's a variety of things that you can learn here in this convention."

RACHELLE JUSTINE C. SIGAL
Infant Jesus Montessori Center
"Para po sa akin ang ganda po nung exhibit kasi parang bago po sa paningin 'yung mga inventions na pinresent po nila. Tapos pinakanagustuhan ko po yung Hybrid Road Train. Parang ang astig kasi."

ROBERT T. FLORES
Infant Jesus Montessori Center
"Ang nagustuhan ko po ay yung napagtanungan po namin ng kaibigan ko sa banda doon po yung about sa animation po sa technology. Ang nagustuhan ko po doon, tinuruan po nila kami kung anong magiging course namin for future about animation, animate things, and about art. At doon po namin nalaman na may mga bago na pong technology at saka bagong software for editing."

ALEXA REVATORES
Dr. Arcadio Santos National HS
" Ang masasabi ko po dito sa NSTW – napaka exciting tsaka very meaningful para sa akin, kasi first science convention ko itong napuntahan. And science for me is life. Kapag walang science, wala kang matututunang iba, wala kang madi-discover or walang reality."

Mark Joshua Angeles
Dr. Arcadio Santos National HS
"This is my first science convention day and I have so much fun in this convention because… kasi po marami po akong nakita, nakita ko po kung paano mag wave yung…. kung paano mag form ang tsunami, kung ano yung mga layers ng bulkan at kung ano mararamdaman kung sakaling dumating na yung earthquake. Nakita ko rin sa bandang kanan yung mga exhibit na tungkol sa plants – na kung ano yung mga characteristics nito. At sana po sa susunod, makapunta ulit ako."

EMMANUEL EBORA
Manuel S. Enverga University
"All I can say about these exhibits are it's very educational and I can learn many things here."

DR. ESCAPE
DepEd Sta. Rosa
"So far magaganda naman ang display ninyo, very informative, helpful…. lalo na sa nagkaka-edad. Okay yung RxBox. Marami kayong mga brochure. The information is not limited."

Dr. NABO
DepEd Sta. Rosa
"We tried RxBox. Very interesting siya. Isa pang napuntahan namin yung sa bone….kasi interested ako doon sa artificial knee. Yung mga food na binebenta are very nutritious naman, tinignan namin. Yung mga content niya, informative, educational. And children will really enjoy the exhibit, especially mga secondary, ma-appreciate nila yan."

JEREMY BUNAO
Pamantasan ng Lungsod ng Muntinlupa
"Ang masasabi ko, okay naman 'yong place kasi kilala siya tsaka magaganda din 'yong mga exhibit. Ang hirap nga lang mamili kung ano 'yong pinakamaganda."

RICHARD AMBAHAN
Pamantasan ng Lungsod ng Muntinlupa
"Nakakatuwa ang mga invention ng mga ilan nating kapwa Pilipino na nagpakita ng kagalingan ng mga Pinoy. At sa naganap na event na ito ng NSTW, napakarami kong nakitang nakakahangang invention

NSTW

ng ilang university na lahat ay talagang mapapakinabangan ng ating mga kababayan. Mas na-inspired ako lalo sa mga bagay bagay na hindi imposibleng magawa ng tao. Nagustuhan ko ang event na ito ng DOST. Para sa isang event na inorganize ng isang government agency ay talagang napakaganda nito. Sana maulit ito muli at may maidagdag pang iba. Dapat makita ng lahat ng mga tao ang mga invention na gawa ng kapwa nating Pinoy. Talagang may kakaiba tayong mga talent, at para na rin ma-encourage ang mga batang mag-aral ng mabuti."

CYNTHIA MENDOZA
Housewife
"I was actually surprised when I learned na ganito pala kalaking event itong NSTW. My kids are having so much fun, hinahayaan ko nalang silang magpaikot-ikot kasi takbo sila ng takbo from one exhibit to another, hindi ko kayang makipagsabayan. The venue should have been bigger para 'di masyadong siksikan, but everything else is really good. My kids are enjoying, I am enjoying."

EDWIN DUMALAOG
Teacher, Christian Light Academy of Taguig
"Good thing our school was able to attend this event kasi tamang tama sa mga students ko. Nakikita ko sila kanina, fascinated na fascinated sa mga exhibits. Maluwang, matipid dahil electric, tapos malamig saka maganda yung design [ng hybrid road train]. Dahil electric siya, malaking tulong siya para ma-prevent ang smoke sa environment. This kind of invention is of big help sa pollution control. Magandang alternative siya [na mass transportation] sa EDSA and other major roads but I don't know if this can cope up with the speed of other buses. Kung mas bibilis pa sana, mas okay lalo na dahil smoke-free siya.

GRADE 1 STUDENTS
Christian Light Academy
"Ang saya-saya po kasi may mga robot robot tapos may bus pa sa loob."

"Masaya po, saka malamig sa loob [ng road train]. Gusto po namin siya masakyan lagi pag pupunta ng school saka pupunta sa mall kasi maganda saka malinis po."

HIGH SCHOOL STUDENTS
Las Piñas National High School
"Sobrang saya po ng NSTW kasi tamang tama po siya para sa aming mga bata at estudyante. Pinaka nagustuhan po naming yung road train, nakailang sakay po kami kasi sobrang nakakaenjoy po."

"Napakaganda, napaka cool at nakakaexcite sumakay sa isang road train kasi ngayon lang magkakaroon ng ganon. Atsaka bihira lang yung ganyang itsura ng train."

"Gusto po naming maging everyday na sasakyan siya kasi una, eco-friendly, saka walang standing- standing, maraming sasakyan. Mas maganda po siya na sa Metro Manila ilagay kasi mas polluted sa Metro Manila kaya makakatulong siya dahil mababawasan na yung usok. Mas okay kung sa school namin sa Las Piñas ilagay kasi ang astig niya. Tapos yung pamasahe dapat mura lang para mas maging malaking tulong siya."

JONATHAN BRADD NARON
Pamantasan ng Lungsod ng Muntinlupa
"The event itself is great. There are so many exhibits to explore."

MIMAROPA pupils develop app for Pinoy PWDs

By JOY M. LAZCANO
S&T Media Service, *DOST-STII*

These young mobile developers show their smart phones loaded with the I Hear U app.

AT FIRST, you might think "I Hear U" is just a textspeak, sounding hip especially for today's text generation. But I Hear U somewhere in Palawan is beyond that. It is an android mobile application to help persons with hearing impairment learn the ropes of finger spelling or communicating using alpha and numerical systems through hand gestures.

While most teens are busy posting status messages and selfies, Marian Elaine Dechaves and Charmaine Aubrey Galindez are doing something more serious for their age. They hang out longer on their computers, not to post their outfits of the day or OOTDs, throwback Thursday or TBT photos, and hashtags but rather, they are writing program codes which someday could become huge especially in the age of the Internet of Things.

During the celebration of the Regional Invention Contests and Exhibits which coincided with the Southern Luzon Cluster Science and Technology Fair held in Puerto Princesa City Coliseum in Puerto Prinsesa City, Palawan, schoolmates Marian and Charmaine of Bansud National High School-Regional Science High School for MIMAROPA proudly showed their official entry in the Department of Science and Technology-sponsored invention contest.

I Hear U is an ingenious brand name to relay its service as a two-way communication app for persons with hearing disability. The app is basically an instant messaging system with icons showing the various dactyl or hand gestures representing letters and numerals to spell out words to relay messages.

From its main menu, users can choose from Normal or Deaf configurations. The Deaf option shows a keypad with various finger gesture icons with its equivalent alphabet subscripts.

The user then types in the desired message using the dactyl alphabets and sends it through the phone's built-in Bluetooth file transferring device. The recipient then receives the message in pure alphabet characters. Marian explained that originally, the person on the other phone would receive the message in dactyl icons.

I Hear U messaging interface consists of hand gesture icons with its equivalent alphabet subscripts.

Marian Elaine Dechaves (in black) and Charmaine Galindez demonstrate how to use the I Hear U app for persons with hearing impairment.

However, intended end-users prefer to receive the normal apha-numeric characters rather than the icons.

The application is still in its early stage, and Marian said that its SMS capability will follow further in the development stage.

The data transfer using Bluetooth technology can only reach up to 10 meters only. And since the messages are transferred using Bluetooth technology, Charmaine explained that the phones need to be paired every time the app is used.

Although I Hear U is still in its development stage, the duo gets a lot of advice from random users on how to improve their invention.

Surprisingly, both Marian and Charmaine are still in grade school - too early for them to mind real-world problems. However, the two seem to care less about their age as they already recognize the needs of some underserved communities in the country. "We developed this app because we noticed that majority of apps cater only to the typical type of consumer and we want an app that will address the needs of persons with special needs," explained Marian.

Also, the two are hardly experts in programming. According to Marian, she only learned about programming or writing codes a few months back. "I just taught myself to code," she said. Similarly, Charmaine said that programming for her was more of a hobby. "We get to learn to code using the Ai2Live Complete software, which gives also gives us the needed tutorials," she shared.

Aside from coding algorithms for the app, the two also learned the nitty gritty of designs. Marian explained that she consciously picked fonts and colors that match the preferences of intended clients. "You cannot use red, because the color is too strong and could hurt your sight in the long run. Then someone suggested to use blue, but blue and other dark colors are attractive to mosquitoes," she said.

Consequently, I Hear U went live a few months from its development and was demonstrated in Gloria Central School and Juan Morente Sr. Memorial Pilot School in Oriental Mindoro. The demo was evaluated by 30 users in the Special Education class of the said schools. The app was evaluated based on ease of use, accuracy, and speed of data transfer. Out of the three parameters, the users found the app easy to use, with accurate and fast data transferring capability.

However, the app can only be used locally since there is no standard in finger spelling technique. Charmaine explained that internationally, the technique varies in different countries like in Germany where finger spelling is based on the palm lines, while India has different sets of references.

The SLC S&T Fair is a yearly celebration that promotes S&T awareness to the public. The Fair highlights the various strides in the local science community, particularly in Southern Luzon which include the National Capital Region, Regions III, IV-A, IV-B, and V. For this year, DOST Regional Office IV-B hosted the three-day celebration.

Dr. Reinabelle Reyes: Doing science here and now

By MARIA LUISA S. LUMIOAN
S&T Media Service, *DOST-STII*

Dr. Reinabelle Reyes stressed the value of asking questions in the TEDxDiliman held in 13 October 2013.

A certified Spurs Fan *(Photo by Gary Coronado)*

She thought she cannot be a scientist: not here in our country, at least. But Dr. Reinabelle Reyes, the Filipina astrophysicist who became known for proving Einstein right, proved herself wrong.

"When I was a kid I thought of being an astronaut. But at that time it seemed unrealistic. I did not know anyone personally who was a scientist so it seemed that being one was not in the realm of possibilities." related Dr. Reyes.

"So I thought of being an architect because my cousin is one. Sometimes, I wanted to be a lawyer because we have a family friend who is a lawyer. I came from a mixed Filipino-Chinese family who owns a small business, so I thought I would have my own business," she continued.

But when she became a student in Philippine Science High School, her dream of becoming a scientist was rekindled. But even then, she never thought that it was a viable career here in our country. So her goal after high school was to study physics here, and then go abroad for graduate school and be a scientist there.

She did as planned. After finishing Summa Cum Laude in BS Physics at the Ateneo de Manila University, she went to Abdus Salam International Center for Theoretical Physics in Trieste, Italy for her pre-Ph.D. program in High Energy Physics. "It is a stepping stone. After that you can apply to Ph.D. programs in the US and Europe," she explained.

Among the universities she applied to was Princeton-a premiere research university. After passing the very stringent admission requirements of the university, she got accepted in its astrophysics program. Then the real challenge had just begun.

"When I went there (Princeton), wala akong alam sa astronomy (I knew nothing about astronomy)," Reyes confessed explaining that her pre-Ph.D. (high energy physics) is totally different from this one.

"The other thing is you start your research right away. For the first semester, you would choose a project. The next semester you would start another one; and then another. So you would end up with three projects, because you couldn't finish one project in just one semester," Reyes said in a mix of English and Filipino.

Continued Reyes: "The goal of the semester projects is to publish. That was the first time I engaged in high level research that was really intended for publication. You're tackling a problem that will lead to a new discovery. But at the same time you will be guided by the supervisor every step of the way," she narrated.

All her efforts paid off. In 2007, she got an honorable mention in the Chambliss Astronomy Student Award for her paper on obscured quasars during the American Astronomical Society 211th meeting.

Dr. Reinabelle Reyes gamely poses for a group photo after her talk in a career forum held during the 2015 National Science and Technology Week.

A few years later, she led a research that confirmed Einstein's theory of general relativity on a cosmic scale. "It was novel enough that it got published in Nature (a premiere science journal). I was fortunate to have worked with some of the best people in the field of astrophysics," Reyes revealed. That was the research that got her a lot of mileage from the press.

On coming back

After Princeton she became a post-doctoral research fellow in Kavli Institute in Cosmological Physics, University of Chicago. Everything was according to her initial plan. But things changed when Reyes visited the country to give a series of talks. It was those visits that helped her decide to come back—a decision that was not an easy one to make.

"I could see myself being a part of the community here. That's the crucial part," she said.

It's not about the money, but the nature of work," she elaborated. "You have to ask the practical aspect of how do you do science here in this context. How do you pivot in such a way that you can continue your research here?" She explained that a lot of young people are now doing graduate studies abroad and extensively study a subject matter that may not always have direct applications here in the country.

She however sees the situation in a positive light. "These are good problems to have. There is so much to contribute: either from there, or by coming back and being part of the (science) community here."

Now she is using her knowledge in computational science to apply them to the Philippine context. She currently leads a DOST funded project that seeks to develop a decision support tool for government officials and other decision makers specifically for relief operations.

"Relief operation is a supply chain management problem," she explained. "The challenge here is that you want to minimize the time for response and maximize coverage for everyone. Another issue that we want to address is the duplication of efforts. The platform will allow different organizations to log in and put in what they're doing. And the algorithm will recommend where to put more effort," she added.

"But that's part of it. We have to change the culture—that data is important. Eventually that information will help you make better decisions that will also impact lives. Data-driven decision making is really one my advocacies, and this is one concrete way."

She continues, "You can run scenarios. What happens if there is a category 4 typhoon that goes through Metro Manila? You should be able to run these exercises even without this typhoon. For policy makers, this should be eye opening. And this should be the way they do things. That's the plan."

She clarified though that the platform is still under development and they are working now with the Department of Social Work and Development for the entry of relevant data.

Apart from working on this project, Reyes is also an adjunct professor in Ateneo de Manila University (computer science) and also teaches masters in astronomy at Rizal Technical University.

"Na-widen yung mundo ko (My perspectives broadened)," she said of coming back to the country and being involved in the academe, government and industry. She also works as a data scientist in a private company. "I want to be conversant in all three worlds to eventually connect (them) and be effective in them."

Given the current development in science and technology in the country, and despite the remaining challenges, she now believes a science career is viable here. "The trends are positive. You have to imagine in ten years we are pushing this to become bigger."

She expressed her hope that in the future we will have more centers of research that attracts the best of the world and the best of us to do science. "I want us to contribute to the world's knowledge."

In between digging into data, teaching her students, and doing her project, Reinabelle does what most of us do: enjoy coffee, root for a favorite sports team, and engage in social media.

"I am an avid Spurs fan," she revealed. "My favorite member of the team is the coach. I admire his leadership. Being a project lead is like that. You have to inspire them, set directions, and they should be happy working with you."

She has many followers on Facebook and also has a Tumblr account (http://pinoyscientists.tumblr.com), a site that shows "Filipinos doing all kinds of science in all kinds of places". She hasn't updated it for a while now, but she's contemplating on reviving it soon.

To aspiring scientists she advised: "Go for it. Reach out to possible mentors. Now you can reach out to anyone anywhere in the world through Facebook or email. Put effort into it. It will be a rewarding life not only intellectually but in all other aspects as well."

FIESTA time for ROOTCROPS!

By ESPIE ANGELICA A. DE LEON
S&T Media Service, *DOST-STII*

Photos by Gerardo G. Palad and Espie Angelica A. de Leon

Sweet Potato Beef and Shrimp with Lemon Juice, Main Dish Entry by STI Team 6

Cookfest participants race against time to whip up delicious rootcrops-based dishes.

Entry by Team 1 from VSU

Artistically crafted booths selling an assortment of items, dancers in gaily decorated costumes, sports tourneys, contests for the young and old alike, a dog show, a parade, gaggles of people excitedly milling about, and a festive atmosphere pervading the air.

Oh, and don't forget the cassava, sweet potato, yam, taro, and a host of other rootcrops which provided a bonus: great food finds to satisfy the palates and keep the bodies healthy.

Sounds like fiesta time?

Indeed, it's a fiesta for rootcrop farmers and rootcrop industry stakeholders as the Farming and Industries Encounters through the Science and Technology Agenda or FIESTA, an initiative of the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD), got underway at the Visayas State University (VSU) in Baybay, Leyte from July 31-August 11, 2015.

FIESTA is an event-based technology transfer mode which promotes science and technology (S&T) for more profitable and competitive business ventures for micro, small, and medium enterprises (MSMEs) in the agriculture, aquatic and natural resources sectors.

Held in conjunction with VSU's 91st Founding Anniversary, the latest FIESTA highlighted the value-added qualities of rootcrops as business venture commodities of MSMEs. Post-Yolanda

Dance Festival and Parade

accounts revealed the critical role of rootcrops in the sustenance of survivors as these were the only agricultural products left after the fierce typhoon destroyed much of Leyte's agricultural lands.

Rootcrops Technology Forum

FIESTA's main event was the Rootcrops Technology Forum with the theme "Rootcrops Innovation for Health and Inclusive Growth." The forum gathered farmers, extension workers, academicians, students, government and NGO representatives, and members of media to update them on the health benefits of rootcrops, current technological innovations, and other trends for the improvement of farming and enterprises, as well as industry issues.

The panel of speakers was composed of nutrition scientist Dr. Trinidad P. Trinidad of the University of Santo Tomas; Dr. Dilberto O. Ferraren, Prof. Algerico M. Mariscal, Dr. Daniel Leslie S. Tan, Dr. Julie D. Tan of VSU's Philippine Root Crop Research and Training Center; Susan Q. Empeynado, senior agriculturist in Dapitan City LGU; Doc Marlene B. Agabon, owner-manager of Nutri-pros in Antipolo; and Mr. and Mrs. Arnold Labunog, proprietor of Jojie's Bakeshop in Tagbilaran, Bohol.

Another much awaited event was the Dance Festival held on August 10 at the VSU Lower Oval, which transformed the area into a bevy of colors and a show of artistic skills and terpsichorean abilities. Performers from VSU Alang-Alang, VSU Tolosa, and VSU Main College of Education wowed the audience with the visual impact of their dancing and colorful themed costumes as they performed dances reflecting how each of the three towns survived the challenges posed by floods and pests in order to reap the bounty of their harvests.

Meanwhile, the Rootcrops Cookfest showed off the culinary skills of teams from the Southern Leyte State University-Sogod composed of HRM students; Systems Technology Institute (STI) in Ormoc, Leyte; and three teams from VSU.

Team 6 from STI emerged as overall champion, garnering the top plum in all three categories: Main Dish (Sweet Potato Beef and Shrimp with Lemon Juice), Side Dish (Sweet Potato Chips with Mango Salsa) and Dessert (Sweet Potato Cheesecake). First place went to Team 1 from VSU while second place went to Team 5 of STI.

FIESTA's focus on rootcrops is just one among a series of select focus commodities highlighted in each segment of PCAARRD's FIESTA program. Past FIESTA events featured seaweeds and sardines, among others.

PhilAAST fetes outstanding Filipino researchers

By LOTUSLEI P. DIMAGIBA
S&T Media Service, *DOST-STII*

The 2015 PhilAAST Awardees namely (from left) Dr. Ramon Gustilo (received by his representative), Dr. Paulo C. Campos Award for Health Research; Dr. Claro N. Mingala, Gregorio Y. Zara Award for Applied Research; Dr. Nelly S. Aggangan, Leads Agri Award for Agricultural Sciences; Dr. Gerecebio Jonathan D. Alejandro, Gregorio Y. Zara Award for Basic Research; and Dr. Joel Joseph S. Marciano Jr., David M. Consunji Award for Engineering Research. They received their awards during the International Conference on Science & Technology (S&T) Education and 64th Annual Convention last September 10-11 *(Photo by Dr. Diana L. Ignacio).*

For their notable contributions and accomplishments in the field of science and technology, five researchers received awards by the Philippine Association for the Advancement of Science and Technology (PhilAAST) during its 64th annual convention held recently at the De La Salle University, Taft Avenue, Manila.

Dr. Grecebio Jonathan D. Alejandro was conferred the Gregorio Y. Zara Award for Basic Research for his pioneering research on Plant Molecular Phylogenetics in the Philippines and the discovery of novel genera and several new endemic species in Rubiaceae (coffee family) such as the Mussaendaustii in honor of UST (University of Santo Tomas). He is a full professor at the UST College of Science and current director of the Office of Graduate Research of the UST Graduate School.

Meanwhile, Gregorio Y. Zara Award for Applied Research was bestowed to Dr. Claro N. Mingala who is recognized as an outstanding veterinary researcher specializing in infectious diseases of water buffaloes (carabaos). He is a scientist in the Philippine Carabao Center National Headquarters and Gene Pool in the Science City of Muñoz, Nueva Ecija.

Named after one of the country's national scientists who made major advances in aeronautics, engineering and inventions, the Gregorio Y. Zara awards for Basic Science Research and for Applied Science Research were established by the Zara Family and the former PhilAAS in 1968.

Other awardees are as follows:

Dr. Ramon B. Gustilo, awardee of the Dr. Paulo C. Campos Award for Health, is one of the world's leading experts in orthopedic surgery. He has developed an internationally recognized classification of open fractures known as Gustilo Classification of Open Fractures which is now being used by orthopedic surgeons worldwide in the management of open fractures. He also established one of the world's pioneering and leading musculoskeletal and sepsis research unit that remains pre-eminent in the world of basic research and many other feats.

Dr. Nelly S. Aggangan, awardee of the Leads Agri Award for Agricultural Sciences, was cited for her exemplary work as a researcher and scientist in the area of agriculture and forestry. She was also instrumental in the improvement of Mykovam, a soil-based biological fertilizer, as a commercial product efficient in replacing expensive chemical fertilizers for the survival and growth of both agricultural and forest crops.

Meanwhile, Dr. Joel Joseph S. Marciano Jr. received the David M. Consunji Award for his outstanding contributions as an engineering researcher. He is a professor of Electrical and Electronics Engineering at the Electrical and Electronics Institute of the University of the Philippines Diliman. A recipient of many awards, he is currently the interim director of the Institute for Information Infrastructure Development of the Philippine – California Advance Research Institutes, a program of the Commission on Higher Education.

Each awardee received a gift cash of P50,000.00 from PhilAAST (formerly PhilAAS)—an association of scientists and technologists in the country established in 1951 which aims to promote the value of science in the community.

Philippine Science Heritage Center goes interactive

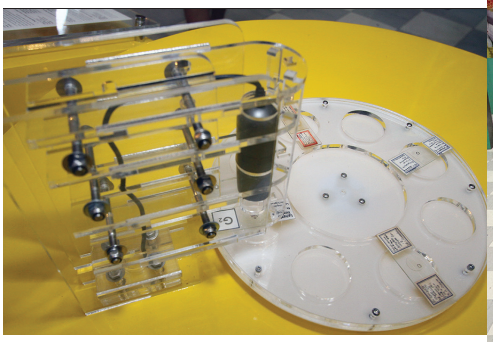
By MARIA LUISA S. LUMIOAN
S&T Media Service, STII-DOST
Photos by Ceajay N. Valerio

The Philippine Science Heritage Center now features five new interactive and digital exhibits to provide visitors a fun and exciting platform to learn about the rich science and technology culture of the country.

A repository of the outstanding accomplishments of the Filipino scientific community, the Center is located at the Science Heritage Building inside the Department of Science and Technology Complex in Bicutan, Taguig City. The latest additions to PSHC are the following:

National Scientists Browser

Get inspired with the life and works of our national scientists through this interactive exhibit. The browser allows the visitors to view the profile, contributions, education, and awards of the 41 National Scientists in the country via touch screen computer.



Be a Biologist

This interactive exhibit features two kiosks, each with digital microscope and a monitor. Users can observe the provided specimens under the microscope through the enlarged image projected in the screen/monitor.

Pinoy Biotech

The Pinoy Biotech exhibit features the recent developments in Philippine biotechnology. Visitors can learn about the biotech product or process by touching the related image to display the information on the large screen.

Play DNA

This piano-inspired exhibit is an engaging way to teach visitors the concept of DNA—the molecules that contain the code used in the development, functioning and reproduction of living organisms. Each note represents a nucleotide—the building blocks of DNA. Play the suggested music or make your own by stepping on the giant piano to "create" different DNA sequences which will be shown on the screen.

Who's Who in Philippine Science

This exhibit showcases the recipients of National Academy of Science and Technology awards including recently recognized Academicians, Outstanding Young Scientists, and Outstanding Books or Monographs, among others.

Formally launched last July 27, the new interactive exhibits are only a prelude to more things to come. More exhibits will be installed as the PSHC gears toward becoming a world class Science Center in the country.

Established in 1998, the Center also conducts various activities such as science career orientation, seminar-workshop for teachers, and science symposia, to bring science closer to the public.

The PSHC is under the management of the NAST Philippines. It is open from Monday to Friday, 9:00 am to 4:00 pm. For reservations, contact the NAST Secretariat at tel. nos. (02) 838-7766 or (02)837-2071 loc 2171.

RICE WITH IRON:
What the two-peso difference can do to one's health

By GERALDINE BULAON-DUCUSIN
S&T Media Service, *DOST-STII*

Iron-fortified rice costs P2 more per kilo. But the benefits to one's health certainly is priceless. This is what this advocate wants to emphasize to people.

"I don't see the price as the problem. There will always be a price war. What has to be done is to market the benefits of the product, so the people will patronize it. Once the people know the benefits, they will buy the product," says Jorge D. Aguilar Jr., founder of Nutrition and Beyond Corporation (NBC), a pioneer in the advocacy and sale of iron-fortified rice (IFR) in the local market.

What the iron does, according to nutritionists, is that it helps carry oxygen into the blood and when that happens, the body system works better. One becomes more agile and less sickly. The brain too functions better. Ergo, it is important that the population is not iron deficient and this is addressed through fortifying rice with iron.

Why venture into iron-fortified rice

"Rice is a competitive business. Anybody with little capital can get into it," Aguilar says.

His family has long been in the rice milling business. His father, Jorge D. Aguilar Sr., ran an all-Japan machinery in his rice mill in the '70s when hardly anyone was using said kind of machine. The younger Aguilar likewise gambled on iron-fortified rice when most capitalist would not venture in it.

Sometime in 2007, a common friend and fellow businessman introduced Aguilar to Dr. Imelda Agdepa and Marcela C. Saises from the Food and Nutrition Research Institute of the Department of Science and Technology (DOST-FNRI). These food scientists explained to him the need and benefits of the rice fortification technology and encouraged him to adopt it in his business. Sensing the sincerity and commitment of the two scientists, he decided to give it a try.

The fortification technology is not really new. But what made the difference is that through FNRI's extensive research, they were able to elevate the IFR to such a level where its taste, look, and texture comes very close to regular rice while retaining the iron component.

Is the market ready for IFR?

Breaking into the market was difficult at first but through the help of the provincial and local governments, Aguilar was able to introduce the iron-fortified rice into the market. Market-testing was done in 2008 in Bataan and Zambales. NBC was established in 2012 and has been a major supplier in almost all towns in said provinces.

At the start, there was a two-peso price difference between the IFR and the

regular rice in the wet market and this turned off some people. However, despite the difference in prices, Aguilar does not believe that the price is a problem.

"As it is, the price is at the level where it is affordable. Consumers from Bataan and Zambales can afford it," he says.

And he believes that the price of IFR can still go down a bit should the volume on demand increase; that is, if more Filipinos will make it their staple.

The challenge

The Philippine Food Fortification Act of 2000 or Republic Act 8976, "An Act Establishing the Philippine Food Fortification Program and for other Purposes," has been around for over 15 years. As iron deficiency is prevalent in a large part of the Filipino population, the FNRI was tapped to provide a solution to the problem.

Despite the law that says rice should be fortified, consumption of IFR is still not as massive as that of regular rice. The greater challenge is in the marketing. More Filipinos need to be aware of the benefits of iron-fortified rice. Some people think that they might get an iron overdose if they eat IFR daily, or that they get healthy after a certain number of consumption. But these are misconceptions.

Having a hard time getting into the low-end market, Aguilar decided to add iron to his high-end rice, and this succeeded in the supermarket. He now regularly supplies IFR in some known supermarkets in Manila.

The expense is not so much in the process of rice production or product. The major costs go to marketing or promotion. The packaging alone is costly, such as the production of label sticker or the vacuum pack which run out after about three months. That translates to a capital that lies asleep in three months. For the town market, he uses the ordinary plastic, but for those in the supermarket, he uses vacuum package.

A promotion activity, such as food tasting in one supermarket, can cost at least P10,000 a day because of the fees for the supermarket and promo staff, and purchase of some dishes to go with the rice.

Aguilar believes that people have yet to be aware of the health benefits of the IFR and that the government can help a lot in its promotion. The market though is expanding. Five years ago, Aguilar was the sole supplier of IFR in Zambales and Bataan but now there are other players who come from other parts of the country. The good thing is that he has been getting inquiries from as far as Mindanao. Moreover, he is also looking into the possibility of getting into IFR export.

FNRI fortification technology and other services

Aguilar attended a rice seminar in Bangkok and he was both proud and surprised that the Filipino experts are well regarded by the foreigners in the said conference.

"The way I look at it, ang DOST… like for example noong nakasama ko sila sa rice seminar na yun, they were well regarded by the international team. Hindi sila yung basta masasabi mo na may dumating na Amerikano na authority dito sa ganitong technology, sa tabi lang sila. Noong nakita nila sina Dr. Agdepa, parang long lost friend. Hindi sila yung tipong nagmamalaki sa mga taong ito. They know that these Filipinos also know what they also know. We're at the same level. Ngayon lang ako nakakita ng hindi ba 'Amerikano ko, ikaw Pilipino ka.'.Nakita ko, wow, ang taas ng tingin ng Amerikano sa Pilipino (The way I look at it, DOST…like when I had a chance to be with them in a rice seminar, they were well regarded by the international team. It was not like they (DOST) were just at the sidelines when American authorities came over. When they saw Dr. Agdeppa, they were like long lost friends. They (Americans) were not the type who would act haughtily. They know that these Filipinos also know what they also know. We're at the same level. That was the only time that I did not see any 'I-am-American-you-are-Filipino' attitude. What I saw was how high these Americans regard Filipinos)," he says.

He also found that the FNRI-developed rice fortification produces better results and is far more superior compared with those produced from other Asian countries, which turn brown or orange when cooked. FNRI technology has made IFR sparkling white, taste good, and smell good too. Laboratory tests also showed that Filipino IFR has better efficacy.

FNRI has been tapped not only by the government but also by large food manufacturing companies for research and technology assistance. Their R&D and services also benefit entrepreneurs, especially those in the food business. Some of their services are Technology Commercialization and Transfer, Food Pilot Plant Services/Technologies Business Incubator (TBI), Food Processing Facility Development in the regions, Food Analytical Testing Services and many others. For details on the Institute's services, visit http://www.fnri.dost.gov.ph/

DR. CLARO M. SANTIAGO
Espousing economic value in research

By HAZIEL MAY C. NATORILLA
S&T Media Service, *DOST-STII*

Dr. Claro M. Santiago, Jr., research consultant (Scientist) at the Department of Science and Technology-Industrial Technology Development Institute (DOST-ITDI) and research director of the Research and Development Center of the University of Perpetual Help System DALTA, contributed vastly to the fields of biology and microbial genetics. Primarily famous for his research on mushrooms, his publications and patents focus on gene modification, gene manipulation and technological applications involving plants, fungi, and bacteria protoplasts.

"The researcher's work needs to have a promising result, particularly towards commercialization."

Dr. Santiago received various awards from as early as 1970s including: the Research Award (1972) conferred by the Southeast Asian Regional Centre for Tropical Biology in Bogor, Indonesia), Outstanding Manilan Award as Scientist-Inventor (1987), Outstanding Microbiologist Award (1993) conferred by the Philippine Society for Microbiology, Inc., and Lifetime Achievement Award in Biological Sciences (2006) conferred by the DOST-National Research Council of the Philippines, among others.

In a face-to-face interview with Dr. Santiago, a molecular geneticist, the scientist-inventor recounted to S&T Post how his journey as a Philippine Man of Science began.

The Path

Education:

Bachelor of Science, University of the East
Bachelor of Arts, University of the East
Bachelor of Science in Education, University of the East
Bachelor of Science in Biological Sciences, University of the East
Master of Science, Major in Biological Sciences, University of Santo Tomas (Benemeritus)
Doctor of Philosophy, Major in Microbial Genetics, Nottingham University, England
No. of Publication/s: 60
No. of Patent/s: 1

What began as a fascination for life and living things led Dr. Santiago to concentrate on biology. Still, the road to success is never walked alone. His continuous education with mentors, colleagues, and understudies, plus the resourceful ability to create something out of something, is what made Dr. Claro M. Santiago, Jr. into who he is today. Working at DOST, or what was then known as the National Institute of Science and Technology, since 1973, Dr. Santiago was able to pursue higher education, receive research grants, and file invention patents.

He had a different idea during his youth on what he wanted to become in life. In the beginning, he intended to become a medical doctor. Yet upon completing his academic professions of four Bachelor degrees at a continuous pace, he realized that his interest for medical science faded. Then it happened. Dr. Santiago followed the rigorous path of biology and specialized in microbial genetics - the study of hereditary functions of bacteria and other microorganisms.

Researcher at a glance

While he was studying at Nottingham University in England, he got involved with the study on Dolly the sheep that was cloned from an adult sheep cell. His professor, John Peberdy, was already into cloning research at the time and he was friends with Professor Ian Wilmut. The latter, based in the Roslin Institute in Edinburgh, Scotland, was then working on the Dolly research. There were times when Dr. Santiago and other researchers prepared reagents for the study to be sent to Edinburgh for the research.

Dr. Claro M. Santiago describes how he honed his research upon returning to the Philippines.

A scholar himself, Dr. Santiago understands how scholars have a different outlook in life. Scholars want progress and they use technology, he said. Soon enough, Dr. Santiago returned home and concentrated on the practical applications of research in the Philippines.

In 1986, he was recognized by the Philippine Invention Development Institute for his creative research on fabricated equipment for the production of agar-agar, a jelly-like substance from algae. Agar-agar is a type of media or food source commonly used in growing microorganisms. It is also useful in cooking and baking food.

In 1987, he received the special prize from DOST for outstanding research award for applied research on anaerobic treatment of sugar wastewater using a granular bed up-flow anaerobic sludge blanket reactor. Sugar wastewaters have a high pollution load that needs to be treated if it is to return into the environment. Dr. Santiago explored anaerobic treatment technology where microorganisms can reduce organic materials in the wastewater without using oxygen.

In 1989, he bagged second prize for the outstanding research award for genetic improvement of straw mushroom (*Volvariella volvacea* [Bull. Ex.] Singer) by somatic cell fusion. Straw mushrooms, locally known as kabuteng saging, are soft and large, and they grow in warm weather.

Santiago's research led to the development of an improved hybrid product out of straw mushroom and Agaricus mushroom (Agaricus bisporis, or Baguio mushroom) using genetic engineering

techniques that do not require expensive enzymes. Baguio mushrooms are durable and delicious, but these have thick texture, are small, and will only grow in a colder temperature. Through genetic engineering, the best traits of Baguio and straw mushrooms resulted in a very good mushroom variety.

Dr. Claro M. Santiago shares his vision for the next generation.

Photo by Jeffrey T. Cenetno, DOST-STII

In 2005, Santiago received from the Technology Application and Promotion Institute the first prize for creative research on the production of high temperature Baguio mushroom.

Then in 2007, he patented the utility model for the production of non-woven medical bandage from microfungal fibers. And in 2009, he received from DOST the first prize for the utility model category on the production of medical bandage from mushroom mycelium.

Today, Dr. Santiago continues to do research on genetic engineering, hoping that his works and patent applications will find their way to intended users.

What it takes to be a man of science

Dr. Santiago recognizes that being a "man of science" is a prestigious title accorded only to members of a scientific community. The title brings pride in oneself and in one's community or organization. To be a man of science, said Santiago, "it takes the scientist and the community."

"When one is a part of the community, one carries the community's reputation with oneself. The scientist and the community build their names together," he explained.

Advice to researchers

For researchers who want to hone their research in the Philippines, Dr. Santiago advises that their research needs to have practical and useful applications. The researcher's work needs to have a promising result, particularly towards commercialization. The research should have an economic value, or an attainable potential outcome from the research activity. Since research in the Philippines are sustained by existing resources and technology, a researcher can, for example, find ways to improve living conditions here.

Vision for Fiipinos

Dr. Santiago believes in sustained idealism. He believes that we have to face that the Philippines is yet a developing country. This is a Third World country where idealism comes rare, he said. "Idealism should be found in the nation's children, developed in youth, and carried on throughout adulthood. An idealism equipped with nationalism to help its own country will be able to achieve prosperity," he added.

Santiago likewise said that one can consider prosperity through this nation's environment. "The nation needs something with economic value for prosperity," he said. "Once the nation increases the breadth of prosperity, whatever past problems connected to prosperity can be eliminated."

This man of science believes in discipline, acknowledging that it involves maintaining peace and order.

"Enforce discipline and keep your nation away from hunger," he challenged. He cited Singapore as an example—it has "discipline and a healthy sense of fear; the people obey their laws." Once in place, good peace and order will help solve the problem of hesitation of foreign investors to invest in the Philippines, he said.

When it comes to tangible investments, Santiago has the firm belief that the nation can help itself by focusing on manufacturing industries. Santiago observed that foreign investors like America and Japan stay in Vietnam for example because "the Vietnamese are behaved." The Vietnamese nationalism and drive to work for their country enabled the country to achieve its desired results in manufacturing.

Dr. Santiago likewise believes in supporting proper education and training. "Training begins at home," he said. "It readily molds children on the way they should go. Then, their education is nurtured as the right inclination is combined with pursuing an ambition or interest on a particular discipline they love. Training is a result of teamwork within the capacity of the family, of parents and children when it comes to supporting education."

He also gives importance in improving the financial security of households. "Education is possible when livelihood and stable jobs are available for the people. Train them, empower them with capital, and then ensure that the livelihood capital is used properly, not used in vices, " he advised.

Behind the Name

Name Origin/Meaning: Inherited from his father
Nicknames: Junior, Jun, Claro
Hometown: Born in Singalong, Manila; childhood spent in Marinduque, then returned to Manila
Favorite Color: Cream or White
Favorite Food: Vegetables (green leafy vegetables like petchay, mustasa, lettuce), and fruits
Hobbies: Exercise/Jogging, though not much into athletic activities
Faith: Catholic
Life Motto: "I have to strive very hard."

Santiago grew up in the province and he appreciated it because he was exposed to the provincial way of living, which, he said, was characterized by appreciation for living things, which was as natural as their calm lifestyle.

Today, Dr. Santiago stays fit by jogging for an hour for at least thrice a week. He jogs in the evening during weekdays after work and in the morning on weekends, near an Italian church in Parañaque.

The Mobbed Scientists

JUST MOBBED, NOT MAD. Dr. Ellen Stofan (above) and Dr. Mary Ann Go (bottom photo, next page) were a hit during the "Women in Science" talks organized by Philippine Science High School last August 28, 2015 as their young listeners eagerly posed with them for photos. *(Photos by Gerardo G. Palad, S&T Media Service, DOST-STII)*

They're not mad, just mobbed. NASA Chief Scientist Dr. Ellen Stofan and Filipina neuroscientist Dr. Mary Ann Go are not out to ruin the world with their crazy ideas. Instead, they are committed to reshaping it. Recently, the two recounted their career journeys in their talks at the PSHS Main Campus under the theme "Women in Science." Espie Angelica A. de Leon tells us more.

Replete with anecdotes and witty remarks, their talks took the audience – composed of students from various Philippine Science High School (PSHS) campuses – for a dreamy, enjoyable ride into the world of science. At the end of the ride, the students rushed toward them to get their autographs and have their photos taken. It was easy to see why.

Dr. Ellen Stofan: "Just say 'I belong here!'"

Stofan's father worked for NASA and little Ellen witnessed her first rocket launch at four. Her mother, meanwhile, was a science teacher. By the age of 12, Stofan wanted to work at NASA herself. She wasn't the best student in Math, she claimed, but she kept on trying whenever she solved Math problems "even though sometimes it drives me crazy because I need it in order to be a scientist."

Now a field geologist whose research is focused on the geology of rocky planets and as NASA's Chief Scientist, Stofan encourages women to work in science and technology. "We've got a woman who is in charge of some of the major systems in the rocket, we have women who design spacecraft, women who are astronauts," she shared. Yet, the challenges remain.

According to Stofan, women are still very much the minority in her field which sometimes makes her wonder if she really belongs in it. "I always have to

be much more brave than I actually really am. You have to have that feeling that your input is really important," she said.

Motherhood also makes it more difficult. At a girl group discussion exclusively with female students of PSHS after the talk, Stofan shared her story. At age 27, she was pregnant with her first child while studying for her PhD. A few years after, she was pregnant with her middle child while working on two shuttle missions. Hence, she was constantly traveling while heavy with child. "But it's important for me to be a scientist and to be a mom," she stressed. "So I do both." Now, her kids – a son and two daughters - are in their 20s and late teens.

Dr. Stofan at the Girl Group Discussion

Her tips:

- Be passionate about what you do because it can be hard sometimes.
- Just say, "I belong here." Said Stofan, "I really wanna encourage girls, if anybody ever discourages you, just say 'I belong here.'"
- Have a support system. "It really helps in your career to have people who believe in you - whether it's a teacher, parent, friend," she advised.
- Think about the problems that bother you. When you're weighing your career options, think about what kind of problems you want to solve. Do you want cars or planes to be safer? Do you want to help solve the energy crisis?

Dr. Mary Ann Go: Simply keeps on going

Like Stofan, Go was also interested in science at a young age. Hence, she took up the entrance exam for PSHS in Grade 6 and passed.

In high school at PSHS Eastern Visayas campus, she aspired to become a scientist, artist, lawyer, and tennis player at the same time. In the end, she chose the path destined for her: science. She went to UP for college, pursued her Master's and eventually, her PhD in neurophotonics at the John Curtin School of Medical Research, Australian National University (ANU) in Canberra, Australia.

At ANU, Go and another Filipino Dr. Vince Daria, led a team that developed a unique microscopic system – a two-photon microscope with a 3D holographic laser projector. It uses light to produce signals from the neurons so experts can study how neurons process and integrate information. The technology could also help discover cures for various diseases.

Go, who dreams of winning the Nobel Prize someday, is back in the country as a DOST Balik Scientist. At her talk in PSHS, she said that in the Philippines where women are more empowered, there is an equal number of male and female scientists and equal opportunities for both as well in the lower levels.

Her tips:

- Try and try until you succeed. She kept on applying in different universities – from Singapore and Taiwan to England and the US. She received a number of rejections but she kept on going, until one of these institutions, Tsing Hua University in Taiwan, accepted her. She also added that it took her two years to make an experiment work which included several months of troubleshooting. Yet, she remained positive.
- Know what you're getting into. Unfortunately, she only stayed in Tsing Hua University for only six months. The reason: Everything there was in Chinese.
- Be excellent. Being excellent is being the best that you can be with what you have, she explained.

Milking up: How silage, treatment technologies boost the dairy buffalo industry

By ROSE ANNE K. MANANGHAYA
S&T Media Service, *DOST-PCAARRD*

A bunker silo prepares chopped corn plants for ensiling. *(Photo from the Philippine Carabao Center)*

Silage is fermented and stored in a process called ensiling and is usually made from forage grasses, including maize, sorghum, or other cereals. It is a nutritious feed for buffaloes as it is a good source of energy and protein. The process of ensiling can help dairy farmers in storing food for use especially during dry season, when fodder is not readily available.

In the case of the Philippine Carabao Center (PCC), ensiling can be an agent to improve the dairy production of buffaloes. Nutrition plays a huge factor in the production of dairy, as the milking buffalo needs a good source of protein, minerals, vitamins, and water.

Ensiling technology can help uplift the dairy buffalo industry, especially since local milk producers only contribute 1% of the country's supply of dairy products. Most of the country's dairy requirement is imported from other countries. Nevertheless, the local dairy industry is already showing progress, as in 2013, there was a 5.59% increase in terms of milk

Dr. Daniel Aquino, Animal Nutrition Head & Gene Pool Coordinator of PCC, shows how the chopped corn plants should be stored – in a plastic bag that should be airtight. (Photo from ACD)

A forage chopper is used to chop the corn plants for corn silage production. (Photo from ACD)

production. Of the 19.5 million liters produced, 33.6 percent were from buffalo's milk.

Ensiling will not only boost the local dairy industry but also help dairy buffalo and corn farmers increase their income. Out of one cycle of planting and harvesting corn, a farmer can earn up to P200,000 in a two-hectare lot.

Another benefit is using rice straw and urea, a cost-effective method of providing nutrition to dairy buffaloes. In turn, this method can generate up to P17,766 total sales from 423 kilograms of milk sourced in three months.

Several farmer cooperators of the projects implemented by the PCC and funded by the Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development of the Department of Science and Technology (DOST-PCAARRD) have proven the benefit of these technologies.

Using a variety of rolling up strategies in partnership with business organizations in the government and private sectors, the project, Commercialization of Grass/Forage Corn Silage for Dairy Buffaloes in Lupao, Nueva Ecija through Technomart (TM), aims to fast track the movement of silage products from the source to the market. The project combined a set of trainings, field days, study tours, and promotional activities to increase the interest of farmers in adopting the technology.

Meanwhile, the project Community-Based S&T Project on the Preparation and Utilization of Urea-Treated Rice Straw as Fodder for Dairy Buffaloes was introduced as another technology for community adoption. Three farmer cooperatives from Nueva Ecija were identified as beneficiaries.

There are four main advantages of corn silage production: (1) it is not season-dependent as it can be done anytime, when there is forage abundance; (2) it does not require sophisticated equipment; (3) it benefits from the stable shelf-life and quality of silage under longer storage time; and (4) it can be prepared easily under small or commercial scale.

Reaping the product of technology and hard work

The project is also being introduced to corn farmers as it is an opportunity for them to earn more and to fill the feed shortage during the dry season.

Isagani Cajucom, farmer leader of the project on corn silage, has proven the potential of corn silage production in the market. During one cycle of planting and harvesting, he produced 54,729 kilograms of corn silage in his two-hectare lot in Nueva Ecija, and sold the silage at P191,551,50. It provided him a total net income of P66,661.60 after deducting the cost for labor, planting materials, pesticide and

Freshly chopped corn plants are prepared using a forage chopper.

Fermented corn silage ready for marketing (Photo from the Applied Communication Division (ACD), DOST-PCAARRD)

herbicide application, irrigation, materials for chopping, and transportation, among others.

In a span of two years, Cajucom has earned a total net income of P582,475.80 from four cycles of planting and harvesting.

Corn silage is prepared after harvesting forage corn between 75 and 80 days, or when the ear's seeds have about 2/3 milk-line, or when the distinct horizontal line appears near the end of the corn's kernel. The corn ears are very good materials because of their highly soluble carbohydrates and high-buffering capacity or their ability to neutralize the acid content with little change in pH. The chopped corn plants including the ears are stored in a polyethylene sack with a capacity of 20-30 kg for about three weeks before marketing or feeding to animals.

Cajucom said that the market for corn silage is huge. In the Philippines alone, according to the Philippine Statistics Authority, there are 2.86 million buffalo heads as of July 2014. In a day, a milk-producing buffalo weighing from 400 to 500 kg needs about 25 to 30 kg of feeds.

Not all farmers have access to open pastures where they can let their buffaloes graze, hence the potential of corn silage production is huge. Currently, aside from Nueva Ecija, Cajucom sees demand from Quezon, Batangas, and Pangasinan.

Discarded rice straws as source of opportunity

Nueva Ecija, a town known for vast rice plantations, also has abundant waste after harvest, which, most of the time, are discarded. An opportunity to turn waste into livelihood is PCC's project on urea-treated rice straw that can provide farmers alternative livelihood and better nutrition for dairy buffalo.

Urea, a good source of nitrogen, is commonly used as a food additive for animal feeds and also as fertilizer. This organic compound also known as carbamide is widely used as fertilizer.

However, the right amount of urea, when mixed with molasses in rice straw, can improve its crude protein content from four to seven percent. The urea treatment will help increase the nutrient content of rice straw, which is originally a poor quality forage.

Preparing urea-treated rice straw requires materials such as a big plastic bag, tape, urea, molasses, and water. Rice straws mixed with urea can yield seven to nine percent of protein, a 100 percent increase from the original four percent of protein that can be absorbed by the buffalo. The rice straws can last up to five years and, when opened, should last for three weeks.

Beneficiaries of the S&T community-based project on urea-treated rice straw

(Left:) Herminia Mallari, chairman of the Kapitbahayan sa A. Mabini Producers Cooperative, shows the participants how to make urea-treated rice straw or UTRS. (Below:) A farmer smells the fermented urea-UTRS during the demonstration. (Photos from ACD)

include the Kapitbahayan sa A. Mabini Producers Cooperative, Casile Dairy Cooperative, and Punla Primary Multi-Purpose Cooperative of Nueva Ecija.

According to Dr. Daniel Aquino, project leader, and animal nutrition head and gene pool coordinator of PCC, the project was implemented in Nueva Ecija because of the abundance of rice fields, which ensures the constant supply of rice straw during harvest. In Llanera, Nueva Ecija alone, rice straws from 9,000 hectares of fields are typically discarded and sometimes burned after harvest, and this can be harmful for the environment.

Data from the project observed that on the third month, the 12 lactating cows given UTRS as their diet, were able to produce 4.7 kilograms of milk per day compared with the 3.5 kilograms produced before the intervention. A total of 45 farmers from Nueva Ecija and 73 farmers from Pangasinan benefited from the UTRS technology.

Herminia Mallari, chair of the Kapitbahayan sa A. Mabini Producers Cooperative, said that feeding urea-treated rice straw to her buffalo has given her additional income. Her buffalo can finally produce milk after three years of not being pregnant. She now earns income through production of organic fertilizer using buffalo feces and selling buffalo milk. She also has additional calves which means additional income for her.

According to Mallari, the potential income from making urea-treated straws as a business is high, especially with the low cost of investment needed. Farmers can also save cost from sourcing plastic by using a bunker silo. Bunker silo can be made by digging a hole in the ground then placing plastic at the base. The hole can also be covered with plastic.

Gerry delos Santos, chair of both the Federation of Dairy Buffalo Cooperatives of Nueva Ecija and of the Casile Dairy Cooperative, shared that he uses a bunker silo to store his urea-treated straw. His bunker silos, five meters long, 1.5 meters deep, and are two meters high, can produce about 17 wagons of urea-treated rice straws. Delos Santos said that UTRS has helped him especially when Nueva Ecija was hit by a typhoon and sourcing food for his buffaloes was difficult. Today, his buffaloes' build, as well as their dairy produce, have improved.

Both projects, which are expected to complete in 2016, may not only boost the dairy buffalo industry, but also the livelihoods of the individual farmers. As what the dairy industry say to encourage farmers to go into dairy buffalo farming, 'sa dairy, ang kita ay daily!'

Rose Anne K. Mananghaya

The patience of Job: Technology saves the jackfruit

By DEMOCRITO Z. MAGPANTAY & NOEL A. CATIBOG
S&T Media Service, *DOST-PCAARRD*
and MELPHA M. ABELLO
Agriculture Magazine

Job Abuyabor, a Magsasaka Siyentista, together with his harvest of EVIARC Sweet, which is reputed to be a superior variety in terms of sweetness and aroma.

Through technology, good farming practice, and patience, Job Abuyabor was able to rescue his jackfruits from pests. Now he is into jackfruit processing and has provided livelihood even to farmers' wives.

Dehydrated jackfruit

Science and technology practices, when applied properly in managing a farm, can result in the success of a farmer. In the case of the Magsasaka Siyentista Job Abuyabor, it does not only mean his success, but also the success of other farmers.

As the Magsasaka Siyentista of the Visayas Consortium for Agriculture and Resources Program, he is tasked to share jackfruit technologies and management methods that he has already adopted in his farm which is treated as a research laboratory. One of these practices is addressing the presence of destructive pests like the fruit borer by applying *Metarhizium anisopliae* spray suspension (MSS), a technology developed by Dr. Carlos dela Cruz of the Department of Agriculture-Regional Integrated Agricultural Research Centers (DA-RIARC) and Dr. Ruben Gapasin of the Visayas State University (VSU).

Developed as an offshoot of the three-year project of the DOST and PCAARRD entitled Jackfruit Regional R&D Program for

Region VIII that started in 2008, the MSS project involved VSU and the DA Regional Field Unit 8 through the DA-RIARC station in Abuyog, Leyte.

Metarhizium anisopliae is a fungus that grows naturally in the soil and causes disease in various insects by acting as a parasitoid. Thus, MSS fights fruit borers by causing the parasite to acquire a disease.

The MSS is prepared by mixing M. anisopliae spore cultures with soap solution. It is sprayed to flower buds, flowers, and fruits when the fruit borers start to infest the tree. The spray is continually applied until the fruits are ready for bagging.

The pests fruit borer and fruit fly caused damages that brought a 40 to 50 percent decrease in Abuyabor's income, so he welcomed the development of the MSS that gave him a ray of hope for his jackfruits.

Abuyabor sprays MSS daily on flower buds as they emerge up to 42 days. On the 42nd day, Abuyabor bags the fruit with plastic for the next 88 days and harvests it on the 89th day.

With the MSS technology, Abuyabor has doubled his harvest of jackfruit and he continues to reap more from the technology.

MSS as a complement to good agricultural practices

Aside from the MSS technology, Abuyabor credits his abundant harvest of jackfruit to the application of good agricultural practices in his 7.8-hectare farm along Maharlika Highway in Barangay San Isidro, Mahaplag, Leyte.

He learned these practices as a member of the Mahaplag Jackfruit Growers Association, one of the recipients of the DA's "Plant Now Pay Later" distribution scheme in Region 8.

Applying fertilizer, providing drainage, and pruning were the practices he learned from DA. Abuyabor said that newly planted seedlings and non-bearing trees must be provided with nitrogen while bearing trees should be provided with phosphorous and potash combined with organic fertilizer. For bearing trees, he applies the fertilizer before flowering and right after harvesting.

Moreover, proper drainage can help avoid the incidence of disease in the farm, particularly Phytophthora. After building drainage canals and practicing sanitation, he also performs ringweeding and underbushing every three months. He also learned that injecting phosphonate and chemical Chitosan spray will manage the infestation of Phytophthora in his farm. Abuyabor also learned this technology as a cooperator in the study conducted by the DA, VSU, DOST-PCAARRD, and the Australian Centre for International Agricultural Research.

Maintaining the jackfruit tree is important through the practice of pruning in his farm. He removes unproductive and disease-damaged branches to allow more sunlight to penetrate. Moreover, he controls the number of fruits per tree that will develop during fruiting season. Only one fruit per foot of tree height is maintained to allow bigger fruits to develop. As such, Abuyabor only allows 10 fruits to be produced per tree.

Improving the jackfruit market

With over 14,419 hectares planted to jackfruit and with 51,713 metric tons harvested annually, the Philippine jackfruit industry is lucrative. Region 8, with its favorable soil and weather conditions, is ranked as the 10th top jackfruit-producing region in the country. However, VSU, in its supply chain analysis in Eastern Visayas, reported that there are currently issues such as low yield per tree, low maintenance of jackfruit plantation, high incidence of pests and diseases, unstable price during the fruiting season, and presence of more intermediaries along the jackfruit supply chain. These issues resulted in a shortage of jackfruit production in the region in as much as 8,784 fruits per month.

This concern is now being addressed through S&T interventions by the S&T Community-Based Farm (STCBF), a technology transfer modality of DOST-PCAARRD, which will upscale the application of S&T interventions for adoption by jackfruit farmers in the region. It will also provide the raw material requirements of the TechnoMart (TM) project.

The STCBF and TM projects are fruits of the collaboration of the VSU, DA- Eastern Visayas Integrated Agricultural Research Center, and five local government units in Leyte.

Abuyabor was identified as the entrepreneur for the dehydrated jackfruit which is his venture into jackfruit processing. Through this venture, he hopes to create new livelihood for the community, especially for the wives of the jackfruit farmers.

Job Abuyabor shows off his harvest of jackfruits.

Democrito C. Magpantay

Noel A. Catibog

A taste of freedom to "kakosa": A lifeline to mainstream society

By EDWIN C. VILLAR
S&T Media Service, *DOST-PCAARRD*

Using S&T-based interventions, this native chicken project provides livelihood, lifeline, and lifestyle option to inmates who are preparing for new lives outside prison bars.

Science-based production of Zampen native chicken by the San Ramon inmates.

Dr. Villar interacts with the inmates about the project.

Cascading the fruits of R&D to the countryside to change the lives of people is the ultimate dream of any researcher. It takes a lot of effort and resources, though, to disseminate or promote technologies or innovations to change mindsets and ways of farmers, encourage them to adopt these, and finally help them increase their productivity and income.

For livestock and poultry, it is well recognized that this subsector contributes significantly to the growth of the agricultural sector. In fact, livestock is not a mere likelihood, but a livelihood, a lifeline, and a lifestyle.

Raising the quality of native chicken

In the Zamboanga Peninsula, a project titled Evaluation of the Sustainability and Profitability of Zampen Native Chicken (also known as 'Joloano') Production as Source of Livelihood in Rural Communities is underway. The project is led by the Western Mindanao State University (WMSU), through Dr. Teresita Narvaez, Western Mindanao Agriculture and Aquatic Resources Research and Development Consortium (WESMARRDEC) director.

The project is a component of a DOST-PCAARRD-supported native chicken program titled Purification, Improvement and Sustainable Utilization of Native Chicken Strains in Bohol, Bicol and Zamboanga Peninsula.

The project adopts the technologies and protocol developed by WMSU on management of the Joloano native chickens-- from hatching, day old, hardening, and up until the birds are ready for breeding; selecting and purifying the strain; and developing the health protocol and feeding management system.

Soaring beyond the coop

With these science and technology-based interventions at hand, including promotions done, about the potentials of Zampen native chicken, the demand for the strain to meet the local needs in Zamboanga Peninsula has grown. In fact, there is demand even from other provinces and regions of the country.

The gates of the San Ramon Prison and Penal Farm in San Ramon, Zamboanga. (Photos from the Livestock Research Division, DOST-PCAARRD)

PCAARRD Executive Director Rey Ebora shows his skills in classifying native chicken through the breast.

MOA signing with San Ramon Penal colony Officer-in-Charge Emmanuel Narvaez, BUCOR official Marlon Morales, WMSU President Milabel Ho, with PCAARRD Livestock Research Division (LRD) Director Edwin C. Villar.

The project has created awareness and instilled appreciation among local government units, the Department of Agriculture, academe, and even NGOs in Zamboanga Peninsula, where, for many years, this resource of native chicken was not given importance.

The project, with all its benefits and potential in giving hope and direction to people, caught the interest of the San Ramon Penal Colony management. The penal colony, a 30 to 45-minute ride away from the city, is adjacent to the project site at the WMSU campus in San Ramon, Zamboanga City. In no time, the penal colony, with the support of the Bureau of Corrections, started a livelihood project that used the results of R&D on native chicken production.

Chicken gives a taste of freedom

Project beneficiaries are inmates or the "kosas" who are about to complete serving their sentence within one to three years. Earlier sentenced and detained for robbery, murder, kidnapping, and other crimes, most of them came from the National Bilibid Prison in Muntinlupa.

For the inmates, the livestock project is a lifeline—a link to the outside world that will eventually help them start over with their lives. Through the project, they were equipped with knowledge and skills that will help them start afresh once they are finally released.

Particularly, the inmates learned how to raise native chicken. It is not surprising that most of these inmates already have the basic know-how and yet are very much trainable and enthusiastic because they have experienced raising chicken (gamefowls, range chicken, or broilers) in their provinces.

Ultimately, livestock will become a lifestyle to inmates who choose to go by it.

The inmates will get a monetary share from the stocks sold initially to WMSU, but they will be required to market the stocks produced from the penal colony. When they are about to be released, they will be provided with a starter package of breeders to serve as their "pabaon" or parting gift. This gift will help them start a new life should they prefer this option.

The WMSU researchers will make sure that through the package of technology developed, the stocks sold as breeders will meet the standards set by the project for the market. This will assure quality in terms of predictability in performance as well as sustainability in supply. The livelihood project with the inmates is expected to address the production of stocks to satisfy the growing demand for native chicken.

With this project, the "kakosas" of San Ramon Penal Colony, while still detained, can already breathe the air of freedom and prepare for a better life through science and technology.

Edwin C. Villar

Fighting Fusarium wilt

By SHARIE AL-FAIHA A. ABUSTAN, GRETCHEN O. NAS & ROSE ANNE K. MANANGHAYA
S&T Media Service, *DOST-PCAARRD*

This import from Panama turned our green banana fields into yellow. But through technology intervention, our Cavendish will once again put the country back on the map as one of the largest banana exporters in the world.

Davao, with its rich volcanic soil and climate suitable to fruit trees, has been battling a disease that has been ravaging hectares of Cavendish banana plantations since 1997: Panama disease or Fusarium wilt. Being the second largest banana exporter in the world and with banana as one of the biggest dollar earners in the country, the Philippines' banana export may suffer due to the prevalence of this disease in the region.

Addressing fusarium wilt

Fusarium wilt is a disease caused by a soil-borne pathogen, *Fusarium oxysporum f. sp. cubense* (Foc), which could thrive in the soil for years, causing banana plants to wilt and making the plantation unproductive. Fusarium wilt has four races, with races 1 and 4 affecting bananas. However, tropical race 4 (TR4) is a more important concern because it greatly affects the Cavendish variety being exported by the Philippines.

To address this challenge, the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development of the Department of Science and Technology (DOST-PCAARRD) in 2005 funded surveys of banana-growing areas for Fusarium infection as part of the S&T Anchor Program (STAP) for Banana. In Luzon and Visayas, the provinces surveyed include Camarines Sur, Quezon, Laguna, Oriental Mindoro, Isabela, Quirino, Nueva Nizcaya, and Negros Oriental. In Mindanao, the survey covered Compostela Valley, Davao del Sur, Davao del Norte, Davao Oriental and Davao City.

Out of the survey, PCARRD developed maps of the disease incidence in Luzon and Visayas areas in collaboration with the National Mapping and Resource Information Authority. Surveys showed that the Latundan variety was most infected. On the other hand, in Davao, there was no reported incidence in Davao del Sur and only a low level incidence was reported in Davao del Norte and Davao Oriental. Also in Davao, infection was most severe on VCG1213/16, a Cavendish variety.

To lower the disease incidence in the field, growers used a commercial microbial fertilizer at the banana nurseries. However, it was later determined that the most effective method in battling Fusarium wilt was the use of resistant varieties.

Fusarium wilt-resistant varieties identified

To address the concerns of the Cavendish industry on Foc TR4, DOST-PCAARRD together with the Southern Mindanao Agriculture and Resources Research and Development Consortium (SMARRDEC), Bureau of Plant Industry – Davao National Crop Research and Development Center (BPI-DNCRDC), University of Southeastern Philippines (USeP), and the University of the Philippines Los Baños (UPLB) evaluated seven giant Cavendish tissue culture variant (GCTCV) somaclones under farmer's field condition. This was under the program "S&T Management Approaches Against Fusarium Wilt (Fusarium oxysporum f. spcubense (Foc)) on Cavendish in Mindanao", which was implemented from 2012 to 2015.

The GCTCV somaclones originated from the Taiwan Banana Research Institute (TBRI) and were made available to the Philippines for research purposes by the Bioversity International as the overall coordinator for

A bunch of healthy Cavendish banana were product of the Fusarium wilt-resistant GCTCV somaclone.

A banana plantation in Matilo, Nabunturan, Compostela Valley Province, was planted with seven Fusarium wilt resistant GCTCV somaclones. The project, Adaptability Trial of Seven GCTCV SomaclonesAgainst Fusarium Wilt (Foc) is under the program, S&T Management approaches against Fusarium Wilt on 'Cavendish' in Mindanao.

the Banana in the Asia Pacific Network (BAPNET). The GCTCV somaclones tested were GCTCV 105, 106, 119, 215, 218, 219, 247.

The various GCTCV somaclones were monitored in a hectare of each farmer's field. Eight farms selected the GCTCV 218 and 219 which were planted in a bigger scale. GCTCV 219 showed very high degrees of resistance across locations while GCTCV 218 still showed varying degrees of resistance across locations but provided good hand formation and is also acceptable to the export market based on initial trial shipment done in China and the Middle East.

Effective management of the disease

Aside from the identification of wilt-resistant Cavendish variants, the research team developed a package of technology effective in managing the disease.

Three microbial agents, Vesicular Arbuscular Mychorrhiza (VAM), Effective Microorganisms (EM), and Trichoderma harzianum, were identified as potential control for the disease. After testing against Foc under greenhouse and field conditions, the three microbial agents successfully reduced Foc TR4 field incidence.

T. harzianumhas controlled Fusarium wilt by 65 percent in GCTCV 218 while EM reduced the disease by 64 percent. There is no disease observed on GCTCV 219, proving its strong resistance against Foc. EM reportedly reduced the Fusarium wilt disease by 63 percent, while the combination of VAM and T. harzianum controlled the disease by 67 percent across locations in Grand Nain, a highly susceptible Cavendish variety typically grown for export.

Currently, the research team is refining the methodologies in applying the microbial agents in the plants to increase their effectiveness.

Regaining ground in the global market

With several banana growers in Davao growing the moderately resistant GCTCV 218 and highly resistant 219, the growers need to pass the export standards of foreign countries as an important step to regain the country's position in the global market. Recently, both somaclones passed the export standards of China and the Middle East. Some growers have already harvested export quality fruits and eventually started exporting abroad.

Through the adoption of technologies generated in the program, DOST-PCAARRD and its partners hope to help the industry regain its strong footing in the global market scene. Specifically, it is hoped to support the growers in rehabilitating their farms and, consequently, ensure good harvest and income.

The technologies are intended for the local growers and exporters in Cavendish-growing areas in Mindanao, particularly Regions 9 to 12.

Resistant varieties seen to benefit Davao farmers

In one of the farmers' fields where GCTCV 218 and 219 were tested and monitored, Natividad Cruz shared that resistant varieties as form of assistance were better than giving them cash and farm inputs. When Fusarium wilt ravaged her 17-hectare banana plantation and turned it to yellow, only two hectares were spared from the wilt.

With the resistant varieties, she noted that there had been significant change in her farm – from "nothingness to plentiful."She also observed that the Grand Nain later showed some degree of resistance which she attributes to the presence of GCTCVs 218 and 219.

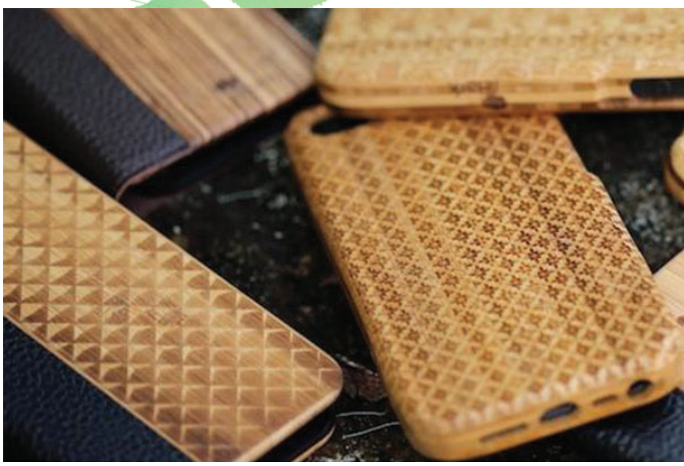
As the technologies are further refined, DOST-PCAARRD and its partners are hoping to see more farmers who can benefit from the technology. When more farmers are able to take advantage of the planting materials with GCTCV 218 and 219, the banana export industry is expected to rise again and farmers can also claim, like Cruz, that their plantations can turn from nothing to plentiful.


Gretchen O. Nas


Rose Anne K. Mananghaya


Sharie Al-Faiha A. Abustan

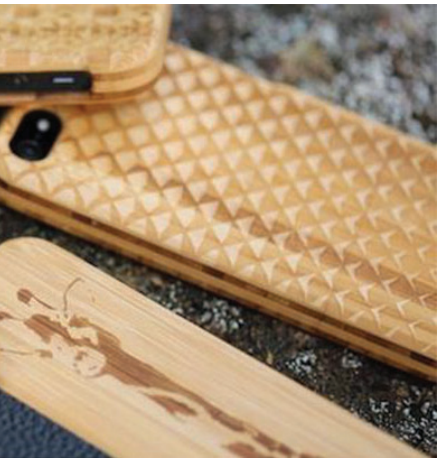
Where do kawayans go?



By ROMELIE JANELLE MARANAN
S&T Media Service, *DOST-STII*

You think you've seen a thousand uses for kawayan (bamboo)? Here's a lot more.

President and COO of Filbamboo Exponents, Inc., Founder and Musical Director of Kawayan7 Modern Bamboo Band, and Executive Director/ Proprietor of Cre8 Innov8 Marketing, Atty. Dulce Blanca T. Punzalan discusses bamboo processing and utilization, as well as the projects and products of Filbamboo Exponents.



Bamboo sunglasses and bamboo bicycle are some of the products of Filbamboo Exponents, Inc. Even modern equipment like computer keyboards and cellphone cases can be made from bamboos.

In a forum entitled, "That Thing Called Kawayan," attendees were treated to various practical and fun uses of bamboo (kawayan in Filipino).

"Bamboo is considered as a poor man's timber; basically the use of this material is limited only by one's imagination and passion. Little did we know that there are so many things that we can do with bamboo, we just have to learn how to do it," Dr. Romulo Aggangan, director of DOST-FPRDI, said in his opening message.

During the forum, seasoned bamboo experts from DOST-FPRDI and other agencies explained bamboo propagation and plantation, processing and utilization, marketing, and assistance given to the bamboo industry.

According to For. Gregorio Santos Jr., senior science research specialist and current officer-in-charge of Laboratory and Demonstration Areas Section, Ecosystems Research and Development Bureau of Department of Environment and Natural Resources, there are lots of reasons as to why the bamboo industry should be supported by every Filipino, stressing the high global demand for bamboo products. In fact, in 2012, bamboo industry products amounted to US$2 Billion, and are expected to increase to US$20 Billion in 2015.

Santos also underlined various methods of bamboo propagation and plantation establishment to educate the forum participants and utilize it in the future.

Meanwhile, to support and strengthen the bamboo industry, the Department of Education is hereby required to use bamboo in at least 25% of the school desks and other furniture requirements of all public schools nationwide every year, as per Executive Order 879 created by the Philippine Bamboo Industry Development Council. The EO also includes the prioritization of using bamboo in furniture, fixtures and other construction requirements of government facilities.

FPRDI's Engineered Products Development Section Supervising Science Research Specialist/ Chief, Dr. Rico Cabangon, on the other hand, stressed the role of FPRDI in the bamboo industry. Dr. Cabangon introduced the institute's innovations and interventions, including basic and advance bamboo processing technologies, livelihood opportunities for bamboo farmers, and various engineered bamboo products that are generated out of these indigenous materials.

Likewise, Jovito Rey Gonzales, chief science research specialist of the Investment and Business Operations Division of DOST-Technology Application and Promotion Institute (TAPI) discussed the funding assistance for different local bamboo projects given by the Institute.

The other speakers of the forum include bamboo advocate, current President and COO of Filbamboo Exponents, Inc., Founder and Musical Director of Kawayan7 Modern Bamboo Band, and Executive Director/ Proprietor of Cre8 Innov8 Marketing, Atty. Dulce Blanca T. Punzalan; and Chief Trade and Industry Development Specialist, SME Development Section of the Department of Trade and Industry–Region III, Ms. Leonor B. Paningbatan

Palawan studes explore potentials of indigenous agri products

By ROMELIE JANELLE MARANAN
S&T Media Service, *DOST-STII*

Dabbling with gadgets or dabbling with research? These students give us a hopeful future for the youth.

While most of our young are busy updating their statuses and posting their selfies on social media sites, hanging out, following the Aldub craze, and consuming tremendous time playing online games after a very tiring school day, some local high school students in Palawan do it the other way around and continue studying, researching even after school hours.

Palawan Root Crop Tubers

Twelve grade seven and regular high school students from San Jose National High School in Puerto Princesa City, Palawan set aside their pursuit for awhile and focused on some of the province's local agricultural products that are mostly neglected by the community.

These students are Marc Josef Oliva, Xavier Levi Ong, Mary Antonette Favila, Kysha Mae Gagabo-an, Sandra Zulueta, Kier Neco Muaña, Prince Edward Ferido, Ingrid Bautista, Joanna Mae Rapio, Angelika dela Cruz, Joshua Paulino, and Danielle Larida. All were tasked to do a science research study of their own choice, as part of their requirement in their special science class. Eventually, aside from it being a school project, the studies were further expanded, sustained and exploited as an avenue to address the needs of their agricultural industry and their fellow Palaweños.

Presented during the 2015 Southern Luzon Cluster Science and Technology Fair and Exhibit in Puerto Princesa City, Palawan from August 17- 19, 2015, the research studies focused on four agricultural materials found around their community: root crop tubers;

The high school student researchers with their adviser, Ronald Brillantes.

brown, black and red tanner rice; lumabeng beans; and native tamilok (Teredinidae).

Ronald Brillantes, the research adviser, explained that the students really worked hard to accomplish their project.

"These researches are supposedly just a project for their science subject, but because of the brilliance (behind the studies), we decided to enter these to the school level science fair, won, and now we're here to show the researches to more people. Indeed, all the kids' hard work paid off, not to mention the unending support of our school, especially our principal, Dr. Arellano, who has a vision to help his students, to which I am very thankful for," said Brillantes.

One thing in common among the researches is that all analyze the β-carotene, protein, aerobic plate count and total coliform content of each product, and its safety and potential in the food distribution in the country, particularly in the province of Palawan. With the help of the Food Analytical Testing Services of the Department of Science and Technology-Food and Nutrition Research Institute (DOST-FNRI) and the DOST- MIMAROPA

Researchers during the experimentation on Palawan's Brown, Black and Red Tanner (*Oryza sativa*) *(Photos courtesy of Ronald Brillantes)*

Palawan's mangrove woodworm borer tamilok (Teredinidae)

Lumabeng bean

Regional Standards and Testing Laboratory who are offering low-cost testing services needed for the research, the analysis of each product was pushed through.

Most of the studies used High Performance Liquid Chromatography (HPLC) and Kjeldahl method to come up with significant results.

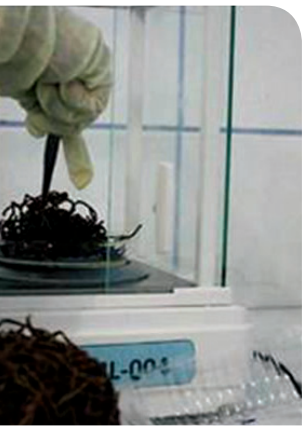
Root crop tubers are pretty much abundant in Palawan. In fact, there are plenty of immense lands where these are yielded, including in their school. But despite its abundance, only a few notice its value. To know more about these commonly ignored crops, Ferido, Favila, and Rapio made a study about it.

The study titled Enhancing the Potential of Underutilized Palawan Root Crop Tubers and Its Implication to Food Security aims to produce nutritious, edible, and safe products out of root crop tubers by analyzing the β-carotene and microbiological results and identifying its potential by-products.

Taro corms, Palawan gabi, yam and cassava were used in the study, and were formed into flour food product for analysis. According to the results, 10 µg/100g of β-carotene were found in Palawan gabi flour and 76 µg/100g in taro flour. Meanwhile, the Palawan gabi flour passed the standard limits set by the International Commission for Microbiological Specifications of Food (ICMF) and the United States Food and Drug Administration (USFDA) on food security, with 1.8 MPN/100 ml of total coli form, and 4000 Cfu/g aerobic plate count.

For now, the flour produced from the root crops was made into noodles and was tested in the community. The researchers recommended that this study should be sustained because based on the results, the nutritional value of root crop tubers is higher and safer than other several known cultivated, edible plants. Plus, potentiality of these crops is now being realized due to easy propagation, vast potential as source of income, storage and preservation ability. Moreover, a variety of food items can be prepared using the flour as ingredient. The researchers are also enhancing the efficacy of the flour as a pastry component.

Oryza sativa, simply known as "rice," is the staple for all social classes in the Philippines. But aside from the common white rice that we know, Palawan is also home to its other



varieties, including the brown, black and red rice. To know the differences between the three, and its nutritional contents and capabilities, Bautista, Larida, and Gamboa worked on a research entitled Characterization of β-Carotene and Economic Potential of Palawan's Brown, Black and Red Tanner (*Oryza sativa*) Flour.

The three varieties of rice were formed into flour food product for analysis. Based on the study conducted, the "forbidden" black rice has the highest nutritional value, with 23 µg/100g of β-carotene, 4.5 MPN/100 ml of total coliform and 1.900 Cfu/g of aerobic plate count, making it the healthiest rice among the three. Meanwhile, the red rice contains 6 µg/100g of β-carotene, whereas the brown, like the white rice, contains none. These results implicate that the food samples passed the standard limits set by ICMF and USFDA, meaning, these varieties of rice are safe to eat.

Further studies should be conducted to determine the products' efficacy to be able to manufacture more products out of these indigenous materials, the study recommended.

Lumabeng bean

Due to protein deficiency problem in the country, many researchers, including Muaña, Dela Cruz, and Oliva are looking for alternative source of protein, thus, study the potential of endemic Lumabeng Bean of Agutaya Island, Palawan.

The study Ethno-Food Study, Protein Analysis and Propagation on Endemic Lumabeng Bean of Agutaya Island, Palawan, Philippines aims to make a natural base and cheaper food product, specifically a type of flour out of Lumabeng bean that will be a good source of nutrients like protein and can sustain the needs of the body.

Based on the study, the flour made from Lumabeng bean contains 24.4 g/100g of protein, higher than other variety of beans like soybeans which contains 13.09 g/100g of protein, and mung beans with 7.02 g/100g of proteins. Meanwhile, the total coliform and aerobic plate count result on the pancake made from the Lumabeng bean flour are 1.5 MPN/100 ml and 1,000 Cfu/g respectively. Proper propagation of the crop is also being studied and will be taught to the community afterwards.

Teredinidae or Tamilok is known for its destructive capability in wooden marine structures. It is actually considered as a pest in European countries. But despite its hazard and unappetizing appearance, little did we know that these species are highly nutritious. To prove that tamilok has beneficial effects, Ong, Zulueta, and Gagabo-an worked on a research entitled Protein Analysis on Palawan's Mangrove Woodworm Borer Tamilok (Teredinidae) and Its Efficacy as Food Additive.

According to the analysis conducted, the tamilok meat contains 8.9 g/100g of protein, at par with other mollusks. Meanwhile, the moisture content of dried tamilok meat (a by-product) is 65.1 g/100g and the total coli form result is 3.0 MPN/100 ml. The results implicate that tamilok is nutritious and safe to eat.

The researchers recommended that tamilok should be given attention by the government, considering that these species may play a big role in food distribution in the future. Harvesting tamilok will also help in slowing the decay process of mangrove trees and other wooden marine structures.

Young researcher's future

Albeit these materials are abundant in their surroundings, conduct of the research became tricky due to different hindrances.

All four studies are pioneer research in their specific areas. Due to its competitiveness, a big amount of money was spent to finish the project and it was shouldered by the school.

"We are currently reaching out to the local government and other private companies to help finance the research studies for them to be sustained and be fully implemented and be brought to the community," Brillantes added. "If these researches will be realized, it will be able to assist the students and the school."

Products made from the four crops will be sold for profit to help the students. They are also looking for manufacturing companies who can help them in the production of the goods. Educating the community about these products is also one of their goals since these are possibly cheap and nutritious food alternatives that can be found easily around them, and, especially, these can be a great source of income.

"I hope more students will be interested in making papers like these (research studies). Expect that I and the school will continue to support, guide, and motivate them, as such explorations can help not only themselves but also our province," Brillantes concluded.

MUGMA S&T in NorMin

By FRAMELIA V. ANONAS
S&T Media Service, *DOST-STII*

Science weaves into culture

It's the first for a science chief. Department of Science and Technology Secretary Mario G. Montejo was named honorary "datu", usually given to persons with significant contributions to the society. Datu is the title for chiefs and monarchs in the Mindanao region, and respective tribes have their own particular customs in conferring honorary datu titles.

During the Science Nation Tour in Northern Mindanao, Sec. Montejo received the title Datu Mahimugnanon from the Manobo word "mugma" which means "to create and innovate", aptly describing Sec. Montejo's role as head of DOST which spearheads innovations in research and development in the country.

According to Rep. Rufus Rodriguez during the conferment at the "Gabi ng Sining at Siyensya" recently at the Luxe Hotel in Cagayan de Oro City, Sec. Montejo put S&T at a higher level, referring to the developments and initiatives that the DOST has pushed since 2010 and are now seeing significant results.

"He is now a Mindanaonon; and, not only that, he is also a datu," he said.

The conferment rites was performed by Bae Noreta Gabao, the keeper of the Tiguahanon, a Manobo culture from the northern tribe of Bukidnon. During the rites, Bae Noreta led the Panubad-tubad prayer, asking "magbabayo" or God to bless Sec. Montejo, and to bestow upon him the skills as Datu Mahimugnanon.

As part of his conferment as datu, Sec. Montejo was clothed with a vest called "kinaraan", necklace called "baliog", a beaded bag called "soning", a bracelet, and a headdress called "tangkulo."

"Gabi ng Sining at Siyensya" is part of the Science Nation Tour, a nationwide information campaign that aims to make Filipinos, especially those in the countryside, "feel" science and technology integrated in their daily lives. The tour hopped its sixth leg in Northern Mindanao region on Aug 20-23

S&T for Northern Mindanaonons

- Presentation of DOST products and services at the 105th Regional Development Council X Full Council 3rd Quarter Meeting with Governor Mohamad Khalid Q. Dimaporo and key local government officials at the Mindanao Civic Center in Tubod, Lanao del Norte.

- Turn over of checks to Gov. Dimaporo amounting to P1,535,500 for the Complementary Food Center in Tubod, Lanao del Norte; and P324,900 for the CEST Project in Magsaysay, Lanao del Norte. The Complementary Food Center is one of DOST's solutions to address malnutrition among young children while the Community Empowerment for Science and Technology (CEST) project is a package of assistance to fight poverty among the marginalized segments of society.

- Signing of the Memorandum of Agreement and Pledge of Support for the joint implementation of the Development of Hybrid Weather Monitoring Systems and Production of Weather and Rain Automated Stations in Region 10.

- Launch of the Food Innovation Center at the Mindanao University of Science and Technology (MUST). The Center will become the hub of food research and development, as well as the development of novel packaging and labelling. Open to all micro, small and medium scale enterprises, the Center is equipped with high-technology machines for food packaging and processing. The Center is a collaborative project of the

MUST, Office of the Second Congressional District of Cagayan de Oro, Food Processors Association of Northern Mindanao, Department of Trade and Industry, and DOST.

S&T champs

• Quiz bee champs for High School level: Gusa Regional Science High School-X represented by Karl Andree Olaivar, Elizur Maandig IV, and Harvey Jade Ang. Coach: Erma Dapin, with ARD Romela N. Ratilla (left) and ARD Mansueta L. Golo (right)

• Quiz bee champs for Grade School Level: City Central School, CDO with Nicol Vincent Bulawin, Monica Comaling, Hailie Saavedra, and coach: Elena T. Galarrita

• Likha awardees: Dr. Reuel C. Pallugna and Engr. Clark Darwin M. Gozon of the MUST bested 17 others in the Outstanding Creative Research category with their patent-pending invention "Low-cost remote rain and stream data acquisition system for mapping of potential micro-hydro sites."

• Sibol (College) awardees: Engr. Christien Joy I. Roque, Engr. Oscar Aguda, and Joel Rudinas from Xavier University – Ateneo de Cagayan got the top prize in the Outstanding Student Creative Research for College category.

• Sibol (High School) awardees: Angelica A. Actub, Shaynamae B. Ybañez, and Nove Jane C. Zurita of Iligan City East National High School outshone 43 other teams from various public and private high schools in the region with their research "Antimicrobial potency of the leaf extract of Chromolaena odorata as medicinal ointment" which chosen as the Outstanding Student Creative Research for High School category.

Mugma in fashion

Hand-woven silk fabrics known as Mindanao Silk from cocoons in Misamis Oriental and hand woven by the Laguindingan weavers perked up the night with color and style. Neo ethnic apparels were from the Philippine Textile Research Institute (PTRI) of DOST, designed by top Cagayan de Oro designers, and modeled by DOST-X staff.

• &T Ambassadors for NorMin were Dr. Franco G. Teves (second from left) for his research outputs that have been useful in the community such as on hydrobioecology that helped communities save Iligan Bay,and for actively advocating the application of science, technology, and innovation in addressing societal issues;Dr. Ricardo E. Rotoras, President of MUST as S&T Ambassador to the Policy Formulation Sector for his proposed policies encouraging science and technology innovation; and Engr. Elpidio M. Paras as S&T Ambassador to the Business Community for his contribution in commercializing technology innovation.

DOST scholars up North

Accepting the challenge of building the blocks for a Science Nation

By ALLAN MAURO V. MARFAL
S&T Media Service, *DOST-STII*

In recent years, DOST programs have been anchored on inclusive development. The science department is taking the lead in various S&T interventions to develop various products and services that address the limitations of resources in different areas of the country, especially in the provinces.

For example, Automated Rain Gauges can help improve weather forecasting, the Hybrid Electric Road Train can help lessen the traffic woes in Metro Manila, laboratories such as the Advanced Device and Materials Testing Laboratory or ADMATEL can help boost the semi-conductor and electronics industry and a digital library such as STARBOOKS can help address the shortage of educational and instructional materials in public schools.

However, if there is one thing in common among all of these technologies, it is that they are all the products of innovative minds of Filipino experts. And DOST believes that strengthening the pool of S &T experts can make a huge difference in boosting the country's economic growth.

During the Science Nation Tour at the Heritage City of Vigan, a Scholar's Summit was held last September 1, 2015 at the University of Northern Philippines. DOST Secretary Mario G. Montejo emphasized the crucial roles of S&T human resources to provide better lives to Mang Juan and Aling Maria in the local communities.

"Increasing the number of S&T scholars in every province has been one of the top priorities of DOST for the past five years. We always recognize that by having more engineers, chemists, biologists, food technologists, and mathematics majors, there will be more opportunities for underserved and unserved areas to improve their economic status," said Sec. Montejo.

He added that it is advantageous to have more locals specializing in science-related fields because it produces more localized researches and innovation that are relevant to the pressing needs of an area in the countryside.

In 2014, a total of 12,117 scholars were supported by DOST's Science Education Institute (SEI) composed of 3,973 new scholars, 6,888 continuing scholars and 1,256 scholar-graduates. New scholarship slots have been expanded from 1,250 in 2010 to 5,595 in 2015.

As of schoolyear 2014-2015, the total DOST-Philippine Science High School System number of students enrolled has risen to 4,587, from 3,532 in SY 2010-2011.

Sec. Montejo shared that former DOST scholars have been major contributors in research and academic institutions as well as in the government. It is a testament how crucial it is to strengthen S&T human resources en route to inclusive development.

"Most of our alumni in Philippine Science High School and former SEI scholars are currently making waves in their respective professions, using their knowledge and skills in different ways. Many of them are spearheading researches in various fields, creating their own companies to bring local employment, and are working in academic institutions to help in molding new breed of science professionals," said Montejo.

The scholars' experience

In the same event, former and current DOST scholars from different provinces in Ilocos Region shared their respective experiences as S &T scholars.

Brian Quero shared how the DOST scholarship program helped him continue his dream to be an Engineer. He graduated from Urdaneta National High School. His father died when he was just two years old, while his mother's income is not enough to send him to any college or university. This is why he is extremely grateful for the five-year scholarship program for Bachelor of Science of Electronics and Communications Engineering that DOST has awarded him.

EJ Magallanes

The scholar from Urdaneta admitted that becoming a DOST scholar is both a challenge and an inspiration.

"It is a challenge to maintain academic requirement stipulated in my DOST contract. It is a challenge to always give my best shot at everything I do because this is the best way to repay the support that DOST has given to me," he explained.

Quero said that getting scholarship from DOST has helped him a lot to concentrate more on his studies, and eventually hone his skills as an engineer.

"It is more than financial support, what DOST scholarship gave to me, but also the values of using my knowledge to make my local area a better place to live [in}", Quero said.


Brian L. Quero


Karl Jigo Tagorda

Meanwhile, Eleanor Joyce Magallanes or EJ to most of her friends is a former scholar from the Philippine Science High School-San Ildefonso Ilocos Sur campus. She came from a simple family. Her father is a high school teacher while her mother is a housewife.

Despite her humble roots, her parents did not forget to instill in her the importance of education. Her parents would always remind her that through quality education, she could go places and achieve her dreams.

"During my first year at Pisay, I asked myself why I entered in this school, why I had to deal with this kind of toxic environment. Then eventually as time moved on, Pisay itself taught me how to appreciate this kind of opportunity and made me realize the special things that I can get once I overcome this obstacle," said EJ.

"I learned that it is much sweeter to have an Ok score by diligently studying than (getting an) easy 100s," EJ added.

EJ finished her double degree in BS Chemistry and Materials Science and Engineering at Ateneo De Manila University. Last year, she passed the licensure examination for BS Chemistry. She is now a Science teacher at her alma mater, PSHS-Ilocos Sur campus.

Scholars' Pledge to Nation Building

Their role in nation building is clear to the "iskolars ng bayan," and they are definitely one in this endeavor. Brian Quero, for one, challenged his fellow scholars to use their skills and knowledge to attain sustainable growth and development.

"It is a responsibility laden on our shoulders as we are tasked to render return service to our country equivalent to the number of years we will enjoy the scholarship," he said.

Quero also encouraged the scholars to do what they can to achieve the tough task ahead of them.

"Let us widen our horizons and fulfill our commitment to contribute towards the attainment of inclusive sustainable growth and development of our country. Spread your wings, soar high as an eagle and bring glory and honor to the Philippines," he said.

"Organize associations of DOST scholars which could serve as your breathing ground in times of trouble where you can meet your big brothers and sisters, who can be your mentor afterwards. Establish an academic requirement with them where you can be yourselves, where you can relax and show the real you," he said.

As a concluding remark, he gave some words to ponder. "As you start your careers soon, I hope you will plant the seed of service, dedication, and love for it. As an old adage says, serving our country is a vocation. It is really a vocation because you will give so much of yourself to others, including patience, care, time, energy and creativity.

Meanwhile, EJ Magallanes is ready to return the favor to her school and to the institutions that supported her education.

"I am looking forward and very excited to be an instrument in discovering and molding young students that could be future leaders of our nation," said EJ.

Karl Jigo Tagorda, a current student at PSHS-Ilocos Sur campus, is also accepting the challenge to be an instrument in nation building.

"Yes, we are the Pisayers and Iskolars ng Bayan, and we are taking the challenge of continuing the legacy of those of you who came before us. We are responding also to the call of the DOST, and the academe to better our skills and widen our knowledge in science and technology in order to be part of a greater cause-- that is to bring this country to greater heights and improve the lives of every Filipino," Tagorda said.

"We ask you not to give up on us. We need all of you. We reckon that what we know is never enough. There are more to learn. Thus, teach us and we will listen. We ask you to educate us more, so that we may always find faith in our capacity to be the country's next leaders in the field of science and technology. Teach us so that we many not turn our backs to this country despite of new breed of heroes," he ended.

96 Hours in Ormoc City, Leyte

An inspired S&T Fair and Science Nation Tour

DOST Secretary Mario G. Montejo (Left) together with other DOST officials cuts the ribbon as a mark of the opening of the 2015 Visayas Cluster S&T Fair and Science Nation Tour.

By MA. LOTUSLEI P. DIMAGIBA
S&T Media Service, *DOST-STII*

Science Nation Tour: Time to Go to Ormoc

A mission to showcase the scientific and technological advancements in Visayas.

What's in Ormoc?

Ormoc, a city in the province of Leyte, has rich agriculture, aquaculture, industry, tourism and commercial services. Among its prime agricultural products are sugarcane, rice, and pineapple.

The city's bustling economy is fueled by many factors including the intervention of science and technology (S&T) which is the Department of Science and Technology's (DOST) vision of all Philippine cities.

Last September 23-26, 2015, DOST Region VIII hosted the 2015 Visayas Cluster S&T Fair (VCSTF) and Science Nation Tour. The event aimed to showcase, via exhibits and other activities, the different scientific and technological advancements that DOST has to offer in the Visayas.

(Left to Right) Hon. Mario G. Montejo, Secretary of the Department of Science and Technology (DOST) awards the medals to PSHS-EVC students who won as the overall champion of the 4th ASEAN Plus Three Junior Science Odyssey (APT JSO) assisted by Engr. Edgardo M. Esperancilla, Director of DOST Region 8; and Mr. Reynaldo B. Garnace, Director of the PSHS-EVC.

Wednesday (Day 1)

8:00 – 12:00 Let's communicate! Simultaneous fora on the Food Innovation Center and S&T Career for Filipino Youth

As a starter prior to its actual opening, the 2015 Visayas Cluster S&T Fair and Science Nation Tour started with a blast of fora that demonstrated how the Food Innovation Center (FIC) works and what its services are. At the same time, DOST scholars attended another forum about S&T Careers for the Youth. One of the speakers, Science Education Institute Director Dr. Josette T. Biyo, shared the four principles for surviving career obstacles and achieving success in any endeavor: (1) love your work; (2) continue to learn; (3) make a difference; and (4) recognize that all our talents, skills and opportunities come from God, thus, we should give back to Him by serving the nation.

13:00 – 17:00 Food, glorious food! Engaging technical sessions at Ormoc Superdome

Discussed during these fora were: Stabilized Brown Rice, Drum Drying Technology for Fruit Flakes, Food for Disaster/Calamity (Emergency Food Reserve) and the SETUP Program. It is important to note that Ormoc is one of many places in Visayas devastated by typhoon Yolanda in early November of 2013. Thus, fora about food for disaster victims can help in preventing the same casualties brought by Yolanda as said fora promote preparedness and awareness for everybody.

Thursday (Day 2)

8:00- 12:00 Ready, set, go! A Festive motorcade with a spirited street dance

Rise and shine! DOST opened the ceremony with a motorcade accompanied by a street dance with DOST Secretary Mario G. Montejo and other DOST officials. Many people gathered in front of the Ormoc Superdome to witness the S&T fair and experience firsthand what DOST Regions VI, VII and VIII have to offer. Also held were the launching and awarding of Region VIII's S&T Ambassador, unveiling of DOST Region VIII's Food Innovation Center Diorama – a miniature model of the actual layout of the FIC building complete with the equipment available inside.

12:00 – 13:00 Face to face: Press conference and awarding

One of the highlights of the press conference was the awarding of medals to the Philippine Science High School students of Eastern Visayas Campus for their winning streak as overall champion, for the fourth time, at the 4th ASEAN Plus Three Junior Science Odyssey (APT JSO) 2015 held in Jakarta, Indonesia.

DOST Secretary Mario G. Montejo together with the Director of DOST Region VIII, Engr. Edgardo M. Esperancilla with other officials were welcomed by a street dance during the 2015 Visayas Cluster S&T Fair and Science Nation Tour.
(Photos by Gerardo G. Palad)

The group is composed of Honeylene Trinchera, Johan Castillejos and Ryan Roi Cayas who were awarded by DOST Sec. Mario G. Montejo, DOST Region VIII Director Engr. Edgardo M. Esperancilla and Philippine Science High School Director Reynaldo B. Garnace. APT JSO is an annual educational event in the field of science and technology for young students aged between 13 to 15 years.

This event is designed specifically to develop the gifts and talents of young individuals and to nurture future scientists and engineers.

13:00 – 16:00 Boost it up! Regional Development Council (RDC) meeting and technical forum for entrepreneurs

In the RDC Meeting, the awarding of Best SETUP Adoptor from Region VIII, Graduate SETUP Adoptors and Awarding of RX Box Implementors (for Regions VI, VII, and VIII) were also held. Additionally, DOST also turned over financial assistance to NEDA8/RDC (Eastern Visayas Federation for Information Technology or EVFIT Project). EVFIT envisions itself as the recognized catalyst and developmental arm in advancing Region VIII's leadership in the IT-BPO industry by 2016.

DOST also handed over hazard maps and the Red Book of Project NOAH. Meanwhile, a technical forum on the SETUP program featured some of the successful SETUP beneficiaries in the Visayas, namely Pinoy Fries by Engr. Ramon Orias, a professor at PhilRootcrops in Visayas State University, and Muscovado Sugar Processing by Engr. Felipe G. Pachocoan, MIRDC extension officer for Visayas. During the forum, Engr. Pachoco said that there are big opportunities for muscovado in the Philippines. "It is up to us to make a good marketing pitch to shift from white sugar to muscovado sugar," he said.

18:00 – 22:00 Time to celebrate! Fellowship Night (Theme: Mardi Gras)

A time to relax and mingle with everyone! This night marks the gathering of all stakeholders and officials with a special dinner and lively performances. Representatives from DOST Regions VI, VII, and VIII had a showdown on the dance floor while others showed off their fab fashion sense via attractive mardi gras costumes in front of the judges. After all the hardship of planning and implementation, all stakeholders now have the privilege to unwind and enjoy the music as well as the dance floor.

Friday (Day 3)

[Part 1] 8:00 – 17:00 All out: Day begins with quiz bees and more fora

Activities galore on this day: The 3rd Philippine Nuclear Congress, 2015 Philippine Nuclear Science Quiz Elimination Round, NRCP Forum that aimed to improve smallholder poultry and swine production in the community, and lastly the PSHS-EVC Quiz Bee.

[Part 2] 8:00 – 17:00 Project hopping: A visit to DOST-assisted businesses in Leyte

The most exciting activity of the day was the project visit to various DOST assisted businesses in different parts of Leyte namely, SC Global Coco Products Inc., Specialty Pulp Manufacturing Inc., LGU RISEMO Complementary Food, Tuklas Lunas Center and various VSU Projects like VSU Phil-LiDAR, National Abaca Research Center, VSU's PhilRootcrops and VSU's TechnoMart and Pasalubong Counter. Secretary Mario G. Montejo led the project visits and checked out the progress of each business assisted by the DOST.

Saturday (Last Day)

8:00 – 15:00 The last blast! An all-around project tour

DOST Secretary Mario G. Montejo together with DOST Region VIII Director Engr. Edgardo M. Esperancilla and DOST Assistant Secretary and Program Manager for Countryside Development Dr. Urdujah A. Tejada, other DOST officials and the media visited various other DOST-assisted businesses around Leyte. These businesses were: Integrated Cacao Production, Community Empowerment through Science and Technology (CEST) Community in Jaro, Leyte, charcoal briquetting, and Inauguration of Region VIII's FIC. Thanks to their warm welcome, the rocky road drive and long trek in the mountains to visit the community in Jaro, Leyte as well as the trip back to Tacloban for the inauguration of the FIC at the Eastern Visayas State University's were all worthwhile.

15:00 – 17-00 Pack up: Home bound and getting ready for a new adventure

Now it's time to go home. VCSTF was indeed full of fun and exciting activities for the community of Leyte. However, with its end comes a new beginning - a beginning for students to go out into the world and embark on yet another journey: starting a business and using the services of the FIC, scaling up a business via SETUP, or simply venturing into an S&T related field of study or career Truly, DOST has been consistently exerting effort to spread science and technology awareness and appreciation in our country to make the Philippines a true Science Nation.

SETUP assists 3,000 small enterprises annually, created 115,000 new jobs in 5 years

By RODOLFO P. DE GUZMAN
S&T Media Service, *DOST-STII*

INCREASED BUSINESS productivity and job creation are but two of the many benefits of the Small Enterprise Technology Upgrading Program or SETUP, a long standing enterprise development and technology transfer initiative of the Department of Science and Technology (DOST).

"SETUP, a development program to empower the micro, small and medium enterprises or MSMEs, creates a conducive business environment for MSMEs to improve their productivity and increase efficiency through the infusion of appropriate technologies," said DOST Secretary Mario G. Montejo.

On the average, the DOST-SETUP program assists some 3,000 MSMEs all over the country every year. For the first semester alone, from January to June 2015, a total of 1,236 firms have been given assistance.

The ripple effect of the DOST-SETUP program resonates to job creation with 20,985 new jobs generated just for the period January to June 2015. From 2010, when the Aquino Administration began, up to end of the second quarter of this year, a total of 115,445 new jobs were already created.

The program uses a holistic approach to enterprise development by covering all aspects of operating and managing a business in order to improve their products, services and/or operations.

The DOST intervention, through SETUP, includes human resource training; technical assistance and consultancy services; design of functional packages and labels; and assistance in the establishment of product standards, including testing, database management system and technology acquisition.

"Firms assisted with technologies are capacitated and become more productive, competitive (locally and globally) and bankable, thus, empowering more our MSMEs as they participate into the mainstream of business activity," stated Montejo.

"This is the only government program assisting MSMEs that gives back refunds to the Bureau of Treasury", Montejo added.

To ensure a high rate of refund by beneficiaries and to uphold transparency and professionalism, SETUP proposals are strictly evaluated by the Regional Technical Evaluation Committee (RTEC) composed of a battery of experts/practitioners from industry, universities and professional organizations. They asses the managerial, technical and financial capability and viability of the beneficiaries/proponents to take on S&T interventions for sustainability.

According to DOST Undersecretary for Regional Operations Carol M. Yorobe, the DOST Regional Offices ensure that funds released to proponents are used for the purpose for which the project was approved and conducts regular due diligence to secure the viability of the project.

DOST Regional Offices release the fund directly to the supplier when equipment have been procured. In other instances, the release of funds is done through the bank who in turn releases it only to the proponent when the required equipment to be procured is already available for delivery. There are also measures in place to address the risk in such transaction.

"The program's monitoring system follows strict guidelines to ensure compliance by proponents and allow the enforcement of the provisions stated in the memorandum of agreement (MOA) they sign before assistance is given," Yorobe stressed.

DOST's regional and/or provincial officers and staff regularly visit the projects and monitor its progress as to the proper utilization of S&T interventions, and correspondingly make the necessary improvements, when needed, in systems or in the use of the equipment or the technology to obtain the desired productivity.

Just like other banking and development assistance institutions in the country, the DOST-SETUP has its share of delinquent accounts for there is no perfect system that could guarantee 100% refund rate from its borrowers.

"I believe that there is no other program in the country that focuses on improving productivity of MSMEs through technology intervention. Overall, our refund rate runs about 85%; but we don't give up on MSMEs that encounter difficulties to ensure higher compliance", Montejo stressed.

In few cases of proponents falling short of expectation, the DOST-SETUP implements a restructuring program, just like ordinary banks, of their refund schedules within the allowable time period.

Further, Montejo assured, "For proponents who fail to abide by the MOA provisions, the appropriate legal actions are pursued in accordance to existing rules and regulations."

From 2010 to June 2015, the DOST-SETUP has already recorded a total funding assistance of P2.2 billion with 29,401 technology interventions provided to MSMEs mostly in the regions. These interventions include consultancy services, human resource training, packaging assistance, design and labeling, among others.

Welding shop's productivity goes up with SETUP

By MARIA LUISA S. LUMIOAN
S&T Media Service, *DOST-STII*

RHENN WELDING Shop which specializes in manufacture of sidecars in Barangay Dili, Gasan, Marinduque used to outsource the bending of steel pipes to Lucena City in Quezon. But the additional costs and long production time entailed by outsourcing prompted the owner Engr. Gener M. Selda to look for better options.

Selda applied for assistance under the Small Enterprises Technology Upgrading Program or SETUP—a Department of Science and Technology program that aims to support micro, small and medium enterprises. In 2012, DOST–MIMAROPA granted him P335,000 to purchase a hydraulic pipe bending machine for his welding shop.

Having their own machine reduced their operating expenses and shortened their production time significantly. They can now produce an average of four sidecars in a month (one sidecar in a week) from the average of two sidecars in a month (one side car in two weeks) before they acquired the machine.

In addition, the quality of their work was greatly improved because the machine can make accurate, uniform and smoother bended steel pipes. As a result, they were able to reduce reworks which also translated to additional savings.

Selda also revealed that aside from making sidecars, they were able to get a project in nearby Sta. Cruz municipality to do the stainless steel railings for a swimming pool.

Extremely grateful for SETUP, he proudly displays in his shop a tarpaulin showing the photo of the check he received from DOST. "Hindi namin kayang bumili nito kung aasa lang kami sa negosyo," (We could not have afforded this machine if we were to rely solely on the shop's income) said Selda.

Finished product

He is also glad that he is able to help other people by providing employment through his shop which now has 15 workers.

Selda hopes to apply for another SETUP assistance after he finishes paying back the amount he received from DOST.

SETUP provides assistance to the following priority sectors: food processing; furniture; gifts, housewares, decors; marine and aquatic resources; horticulture and agriculture; metals and engineering; health products and services/pharmaceuticals; and ICT/Electronics.

For more information about the program, contact the nearest DOST Regional Office or Provincial Science Technology Center in your area.

The hydraulic pipe bender acquired through SETUP has helped produced uniform and smoother bended steel pipes. *(Photos by Gerardo G. Palad)*

Modified rice mill to help boost brown rice production

By MARIA LUISA S. LUMIOAN
S&T Media Service, *DOST-STII*

AS PART of its effort to boost brown rice production and consumption, the Department of Science and Technology (DOST) through the Metals Research Industry Development Center (MIRDC) has developed a retrofitted compact rice mill that can produce both brown and well milled rice.

Unveiled recently in the Science City of Munoz, Nueva Ecija, the retrofitted compact rice mill is a result of collaboration with Philippine Center for Post Harvest Development and Mechanization (PhilMech) of the Department of Agriculture.

DOST Assistant Secretary Robert Dizon mentioned that since 2010, the agency has been promoting the consumption of brown rice primarily because of its health benefits. As opposed to well-milled rice, brown rice contains more vitamins, minerals, and fiber and has lower glycemic index. Brown rice is produced when only the outermost layer of the grain (the husk) is removed.

Asec. Dizon added that the higher milling recovery of brown rice which is 10 percent more than well-milled rice is another reason why DOST is pushing for brown rice consumption as this will spell more income to the farmers and help increase the rice supply in the country.

Meanwhile, Engr. Nico Deus, project leader from MIRDC explained that shifting from well milled rice production to brown rice and vice versa is as easy as turning a lever with the retrofitted rice mill. Modifying the current compact rice mill, as done by MIRDC engineers, simply involves adding a single layer paddy separator and installing paddy and rice ducts.

The compact type rice mill is the most commonly used rice mill in the Philippines.

By retrofitting the compact rice mill, rice millers need not buy another machine should they wish to produce brown rice. Among the other types of rice mill, a multi-pass rice mill can also produce both well-milled and brown rice. But only a few millers own multi-pass rice mills as these are costlier to operate, thus, retrofitting is a better option for most millers.

For more information about the retrofitted compact rice mill, email DOST-MIRDC at mirdc@mirdc.dost.gov.ph, or call 8370431 to 38.

DOST, PLDT ink partnership for faster, more secure access to gov't websites

By ALLAN MAURO V. MARFAL
S &T Media Service, *DOST-STII*

THE DEPARTMENT of Science and Technology (DOST) signed a Memorandum of Agreement (MOA) with Philippine Long Distance Telephone (PLDT) Company to help Filipino internet users in the country towards more secure, efficient, and faster access to various government websites. The signing was held last September 07, 2015 at Information and Communications Technology (ICT) Office in Diliman, Quezon City.

Said MoA defines the establishment of the fiber optic facilities that will link PLDT to the Philippine Open Internet Exchange (PHOpenIX) which is being operated by DOST's Advanced Science and Technology Institute (ASTI).

PHOpenIX, the first and only Exchange in the Philippine Internet industry operated by a neutral institution, was established by ASTI last 2007. It allows exchanges of Internet traffic in a free-market environment among local internet and data service providers.

Meanwhile, PLDT will provide rack space with power in its VITRO Data Center facility, where DOST can set up and operate its third PHOpenIX node. The first two nodes are operated by ASTI in Diliman and Globe Telecom in Makati.

Through this, PLDT subscribers can experience better, faster access to government websites hosted in PHOpenIX.

DOST Undersecretary and ICT Office Executive Director Louis Napoleon Casambre admitted that the quality of the Internet in the Philippines relative to the rest of the world has been the subject of much criticism in the news, social media, and congressional hearings.

"One of the factors contributing to this negative observation is that our local providers are not peered with each other through a local exchange," said Casambre. "Internet traffic from one provider to another still has to pass through international channels before arriving to its intended local destination, causing unnecessary congestion of our connection to the rest of the internet."

QUICK, SECURE, AND MORE EFFICIENT ACCESS TO GOVERNMENT WEBSITES. (Front, R-L) Sen. Paolo Benigno "Bam" Aquino IV, DOST Secretary Mario G. Montejo, together with PLDT Executive Vice President Eric R. Alberto and Head for Regulatory Affairs and Policies Atty. Ray Espinosa sign a Memorandum of Agreement last September 07, 2015 at the Information and Communications Technology (ICT) Office in Diliman, Quezon City. Also in the photos are (at the back, from left) PLDT Vice President for Corporate Relationship Management Renato Castaneda, Vice President and Head of PLDT ALPHA Enterprise Jovy Hernandez, DOST Undersecretary and ICT Office Executive Director Louis Napoleon Casambre, and ICT Office Deputy Executive Director for e-Governance Denis F. Villorente. ***(Photo by Gerardo Palad, S&T Media Service)***

Meanwhile, DOST Secretary Mario G. Montejo said that DOST's partnership with PLDT will allow the government over P21 million worth of free use of the PLDT dark fiber for two years.

"Consequently, this will save the Filipino people significant time whenever they try to access government websites. This arrangement marks a stronger public-private partnership, especially in the field of connectivity," said Montejo.

"The PLDT Group has always been one with the DOST in its mandate to uplift the Filipino's quality of life, by leveraging the latest available information and communication technology capabilities that we have, and the resources that we can humbly contribute," said PLDT Executive Vice-President and ePLDT President Ernesto R. Alberto.

Senator Paolo Benigno "Bam" Aquino IV, who has been pushing for ICT connectivity, said they are not yet aiming for IP peering, but with a telco giant like PLDT as part of the PHOpenIX, it is now a step closer toward the goal.

In the same event also, DOST announced the designation of PHOpenIX as the government's official IP Exchange network in accordance with Administrative Order No. 39.

Two years ago, amid the spate of defacements of government websites, Malacanang issued AO 39, mandating government agencies to migrate to the government web hosting service of ICT Office.

"I am happy to announce that migration of government websites is more than 80 percent complete, with the other 20 percent expected to have migrated fully by the end of this year," said Casambre.

Traffic and urban flood tool using DOST data promises easier navigation by motorists

By JOY M. LAZCANO
S&T Media Service, *DOST-STII*

TEDDY'S TYPICAL drive to work starts from España Boulevard all the way to Commonwealth Avenue in Quezon City. During inclement weather, he would drive through various streets of Manila, dodging floods and traffic, only to be stalled in a gridlock due to knee-high floodwater.

In times like this, Teddy wishes for off-the-shelf solutions to help him navigate through the floods and the traffic on the streets.

Luckily, science and technology might just be the solution to his problem via a program for motorists and commuters called Philippine Metro Advanced Traveler Information System or PhilMATIS.

A project of UP Diliman's Electrical and Electronics Engineering Institute, Computer Science Department, and the National Center for Transportation Studies, PhilMATIS is an integrated and science-based traffic and inundation decision making system for determining traffic volume and flood warning in real-time.

It has two component projects, Urban Flood and the vehicle traffic reporting system.

Using data from the Department of Science and Technology's Advanced Science and Technology Institute, Urban Flood determines, in real-time, the height of inundation in a certain area after a relatively heavy downpour. It has ultrasonic sensor installed in a 3.2 meter post at the center island along San Diego up to Earnshaw Street in España, Manila. This sensor calculates the distance of the floodwater and bounces its signals in the form of echoes into its transceiver. It also possesses a data logger, which sends GPRS and SMS to its website in a three-minute interval. Close to achieving real-time data transmission, the Urban Flood monitoring system is estimated to be 95 percent accurate in determining flood height.

Urban Flood also has a 2 megapixel weatherproof camera for visual surveillance of floodwater. Eventually, 50 units of the Urban Flood system will be rolled out in various cities in Metro Manila through a partnership with the MMDA.

Meanwhile, the vehicle traffic reporting system sends out data and information on the volume, street capacity and vehicle speed in several streets in Metro Manila."The algorithms used in determining the volume and vehicle speed were done by our local experts," said Dr. Adrian Roy Valdez of UP College of Engineering.

The vehicle traffic reporting system is installed at the gantry of a traffic light and consists of a standard-definition camera with infrared technology for night visuals and small computers. The camera captures the vehicle passing through the specific area while the computer measures the speed, street volume and traffic capacity. The data is then sent to a central base or a website which enables the end-user to monitor in real-time the traffic and vehicle volume in a specific time and area.

Both the Urban Flood and vehicle traffic reporting system are in their development and testing stages.

500,000 freelance web-based workers in provinces by 2016

By ALLAN MAURO V. MARFAL
S&T Media Service, *DOST-STII*

Emmy Lou Delfin, program manager of DOST-ICT Office's e-Innovation Group (2nd from left), together with (from left) Butch Valenzuela of Accenture, Evan Tan of Freelancer.com and Olivia Briones of Upwork Philippines, answer questions from participants of the Rural Impact Sourcing Forum last July 28, 2015 at SMX Convention Center in Pasay City during the National Science and Technology Week. Delfin shared that ICT Office is aiming for 500,000 Filipinos in the countryside to work via different online job platforms by 2016. (Photo by Allan Mauro V. Marfal, S&T Media Service)

THE DEPARTMENT of Science and Technology-Information and Communications Technology (DOST-ICT) Office is aiming for 500,000 Filipinos in the countryside to work freelance via different online job platforms by 2016.

This was shared by Emmy Lou V. Delfin, program manager of ICT Office's e-Innovation Group, during the forum on Rural Impact Sourcing last July 28, 2015 at SMX Convention Center in Pasay City as part of the National Science and Technology Week (NSTW).

According to Delfin, the Philippines has more than one million freelance online-based workers who deal with different clients around the world.

"Through its Rural Impact Sourcing Program, ICT Office is looking to generate more career opportunities for those in socio-economically disadvantaged areas in the country through meaningful ICT-enabled jobs," she stated, adding that ICT Office conducts regular workshops in different provinces to help the residents learn how to become successful workers in the digital era.

"Since most ICT-based opportunities are not heavily dependent on location to provide career growth to every individual, we would like to take advantage of it by promoting in-demand online jobs to the areas where there is high population but low employment due to lack of industry investors," Delfin added.

Evan Tan, regional director of Freelancer.com in Southeast Asia, emphasized in his talk that a major benefit of working online is that it negates the necessity of moving to the big cities to find a job.

Tan also said that working online could give everyone an equal opportunity to pursue what he wants to do, no matter what his economic, social, and educational backgrounds are.

Plus, students can already start practicing their profession even before they graduate with the availability of online jobs, especially those which do not require a college degree such as creative and IT-related jobs.

"Traditional employment will no longer be the norm and it will be replaced by contingent workers such as freelancers and part-time workers. The long-term trend of hiring contingent workers will continue to accelerate with more than 80 percent of large corporations planning to substantially increase their use of a flexible workforce," said Tan. "Definitely, online freelancing is the future of work."

DOST, advocates push for the passage of rare diseases bill

By MARIA LUISA S. LUMIOAN
S&T Media Service, *DOST-STII*

BACKING UP THE BILL | Doctors, health professionals, scientists, government workers and advocates pledge their support to the Rare Diseases Bill which seeks to advance the welfare of people with rare diseases. *(Photo by Henry A. de Leon, S&T Media Service)*

ACADEMICIAN CARMENCITA D. Padilla renewed her call for the passage of the rare diseases bill during the Science Legislative Forum organized by Department of Science and Technology-National Academy of Science and Technology (DOST-NAST) held recently at the Philippine International Convention Center.

Rare diseases are debilitating or life-threatening disorders that affect only a small segment of the population. An estimated 6,000 to 10,000 people in the Philippines are afflicted with a rare disease, most of them children.

"Even if we are just talking about one, ten, twenty, thirty, or a hundred versus a hundred million, they still deserve a right to life," Dr. Padilla said.

Dr. Padilla, who was instrumental for the passage of the Neworn Screening Act which institutionalizes newborn screening in healthcare facilities for the early detection of some genetic diseases,expressed her hope that the bill will be passed before the 16th Congress ends.

The Rare Diseases Bill seeks to ensure that patients with rare diseases will have access to adequate medical healthcare, information, and products to treat their conditions. This will be done primarily through the establishment of a comprehensive and sustainable health system for identification, referral, and management of patients with rare diseases—integrated within the current public health system; and the inclusion of rare disease benefit package in PhilHealth.

As well, the bill stipulates giving regulatory and fiscal incentives to support research and development activities on rare diseases and manufacturing of affordable drugs or products. Likewise, it provides for the design and maintenance of a rare disease registry containing data on cases, patients, drugs and products for rare diseases. Data from the registry will be used in policy-formulation.

The said provisions in the bill are set to address the current challenges being faced by patients afflicted with rare diseases, their families and caregivers, and their healthcare providers.

Foremost of these challenges are the high cost of treatment, the accessibility of an existing treatment, or the lack of existing drugs itself. Dr. Mary Ann R. Abacan of Institute of Human Genetics, National Institute of Health in University of the Philippines Manila noted that most pharmaceutical companies do not engage in research and development of drugs or treatment for rare diseases because it is not lucrative thus the shortage of effective drugs for such.

Another challenge, according to Dr. Abacan, is the missed or delayed diagnosis of a rare disease which often results in irreversible damages to the physical and/or mental functions of a patient. This problem also occurs in developed countries like the United States and United Kingdom, more so in our country where there are only nine geneticists for the entire population.

She stressed that early detection and early treatment for some rare diseases can improve the quality of life of the patients and help them become productive members of society.

Call to Action

Health leaders push for improvement of global health systems

By: MA. LOTUSLEI P. DIMAGIBA
S&T Media Service, *DOST-STII*

GLOBAL LEADERS on health during the recent Global Forum on Health Research and Innovation shared their ideas and hopes to future collaborations of stakeholders of various sectors and build partnerships among national and international organizations, the academe, and the government.

Said champions shared their messages, experiences and anticipation to the progress of health in emerging economies.

The speakers were Dr. Gelia Castillo, national scientist of the National Academy of Science and Technology, Department of Science and Technology (DOST); Dr. Renzo Guinto, campaigner of Healthy Energy Initiative, Health Care Without Harm-Asia; Hon. Gregorio Ramon Tingson, chairperson of the National Youth Commission, Philippines; Prof. Dr. Jose Florencio Lapena, Jr., president of Asia Pacific Association of Medical Journal Editors (APAME); Ms. Robin Lim, CNN Hero of the Year 2011 represented by Ms. Christina Ferreros, President, Board of Trustees of the Philippines Wanitadan Harapan Inc. together with Robin Lim who operates the Bumi Wadah Community Health and Birthing Clinic; William Dar, President of Inang Lupa Movement Inc., Philippines; Dr. Gerald Keusch, chairperson of the Council of Health Research and Development (COHRED); Hon. Janette Loreto-Garin, Secretary of Department of Health (DOH), Philippines represented by Lilibeth David, Officer-in-Charge and Undersecretary of Health, Office for Policy and Health Systems, DOH, Philippines; Hon. Mario Montejo, Secretary of the Department of Science and Technology, Philippines; and Prof. Carell IJsselmuiden, executive director of COHRED.

The speakers shared insights on what must be done to the health systems and who must make a move to make the progress unceasing and economically sustaining. Some of the important messages imparted were the following:

"I have three items to include in the national and global research agenda of tomorrow, if they are not already emphasized now: obesity, teen-age pregnancy, and smoking. All three of them could innovatively zero in on creative preventive measures. They are all difficult to address once started, hence they should be prevented. This is my challenge to the health systems of every country." – Dr. Gelia Castillo, national scientist

"We commit ourselves and our journals to publishing innovative and solution-based research in all healthcare and related fields. We commit ourselves and our publishers to disseminating scientific healthcare and medical knowledge fairly and impartially through these means, and recommit our organization (APAME) to building collaborative networks, convening meaningful conferences, and organizing participative events to educate and empower editors, reviewers, authors, librarians, and publishers to achieve real impact and not just impact factor as we advance free and open access to health information and publication that improves global health related quality of life." – Prof. Dr. Jose Florencio Lapena, Jr., president, APAME

"Please support all the small grassroots organizations working to make a difference in people's lives. Organizations such as ourselves need all the help, the support, the partnership that we can get. Be it research, education, information dissemination, policies, resources, enforcement of protocols such as clamping and cutting of the chord, exclusive breastfeeding for the first six months which have been put in place by a really enlightened and pioneering Philippine Department of Health; changes in the architecture of the birth room, and in some cases all we need is just access." – Ms. Robin Lim, CNN Hero of the Year 2011 represented by Ms. Christina Ferreros, President, Board of Trustees of the Philippines Wanitadan Harapan Inc.

"This meeting here really impressed me. Most important I think was when I saw of the young people who were participating in this meeting. If you are an indication of where the Philippines is, you will succeed. Thank you very much and on behalf of the COHRED board it has been our privilege to participate in this." – Dr. Gerald Keusch, chairperson of the board, COHRED.

continued on next page

Champions of health research and innovation share their messages for a call of action on health during the Global Forum 2015 held at the PICC, Manila.

Health research info: Lost in translation?

By ESPIE ANGELICA A. DE LEON
S&T Media Service, *DOST-STII*

EXPERTS FROM the medical journal community agree that health research information should be made available in the language of the country where the research was conducted.

In a forum titled "Medical Journals, Social Accountability, and the Democratization of Knowledge" held at PICC during the recent Global Forum on Health Research and Innovation, representatives of the world's leading medical journals and medical associations discussed the issues on availability of and ready access to health information by the public, among others.

"Just as research participants have the right to be informed of what research is going to be conducted on them or among them, so [do] they have the right to know the results of that research in a language that they can understand," stated Dr. Jose Florencio Lapena, president of the Asia Pacific Association of Medical Editors.

Dr. Martin Delahunty, global head of Nature Partner Journals from the UK, agreed with Lapena, but added that there is a challenge involved. "I believe it is a challenge to find appropriate translators in local languages from English science publications. We as a company, and many other publishers, are not in a position to directly translate," admitted Delahunty in a separate interview. "We outsource to third parties. The ideal is to have the work published open access…. allowing free reuse of that work and particularly, translation of that work," he said.

Open access does allow translation to as many languages as needed, said Dr. Trish Groves, editor-in-chief of the British Medical Journal Open. Groves echoed Delahunty's statement that journals and publishers do not have the expertise and time to perform translation into multiple languages. They could instead pursue Google Translate, she suggested. "There is some evidence that Google Translate is not bad," Groves revealed."If it's your language, you could tidy it up and you can make it okay. It's something publishers could do. But I think it's better to make it open access."

Health leaders . . . from page 67

"The forum on people at the center of health research and innovation underscored two important and equal "whos" inDresearch and innovation, which are, who we are doing it for and who will be doing it. Indeed for us to have a constant stream of cutting edge research output relevant to people would require a huge knowledge capital from people, which, in turn, requires an enabling environment for our research and innovation to flourish. Fortunately for us the sessions that we've had for the past few days outline the steps that we have to take. As we reach the end of this forum, I call on everyone to participate in realizing this enabling environment. And like many big goals we can start with a few concrete steps. First let us secure the resources we will require in a sustainable manner and we have to do it creatively. The Department of Health need to implement a research agenda to fuel evidence or policy for universal health care. We started with 11 million. We generated money by requiring programs to allocate 2 percent of their budgets for research; and we pulled that amount of money to fund the research agenda for universal health care." — Hon. Janette Loreto-Garin, Secretary of Department of Health (DOH), Philippines represented by Lilibeth David, Officer in Charge-Undersecretary of Health, Office for Policy and Health Systems, DOH, Philippines

"This forum gives low and middle income countries a voice, a bigger voice, in shaping the global agenda in research and innovation for health… Hence together let us act on the following. First, create an enabling environment for research and innovation for health in low and middle income countries to develop solution to pressing health problems. Make science, technology, and innovation be part of people's everyday lives, especially those in the marginalized and far flung communities… This community of researchers and innovators are called upon to help us contribute to our national development agenda. Coupled with this is a call for countries to increase resource allocation for research and innovation for health, to strengthen capacity to undertake, manage, transfer and translate knowledge from research and innovation into policies, health actions, product and services which benefit our people." Hon. Mario Montejo, secretary, DOST.

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Food expert recommends nutrigenomics awareness to Pinoy

By ESPIE ANGELICA A. DE LEON
S&T Media Service, *DOST-STII*

"WE STILL need more push to make Filipinos aware of nutrigenomics," suggested Jacus Nacis of the Philippines' Department of Science and Technology-Food and Nutrition Research Institute, adding that in countries like Australia and New Zealand, people have already embraced the concept.

Nacis added that the Philippines is nowhere near other countries which are leading the way in nutrigenomics research, at the forefront of which is the United States.

Nacis was one of the resource speakers in "Advances in Nutrigenomics for Non-Communicable Diseases" at the Global Forum on Health Research and Innovation 2015 held in August at the Philippine International Convention Center. Nutrigenomics is an emerging science which investigates certain areas of nutrition through the use of molecular tools in searching, accessing and understanding the several responses obtained through a certain diet applied between individual and population groups.

According to Nacis, nutrigenomics research in this context by Filipino researchers remains "non-existent." What the country's R&D program has come up so far are evidence pointing to the ability of specific foods like brown rice to help lower blood glucose and cholesterol levels, as well as that of iron supplements to improve the expression of genes responsible in enhancing the supply of iron among pregnant women, among others.

Previously, health issues such as obesity, overnutrition and diabetes created a shift in focus as far as nutrition research was concerned. Now, nutrition research has pushed the envelope even further by examining the molecular basis of nutrition-related diseases. This, in turn, spawned the emergence of nutrigenomics.

Lack of awareness on nutrigenomics in the Philippines may also be due to lack of information.

Nacis revealed though that his team is currently developing the manuscripts for their studies and plans to complete two papers by the end of 2015. "The perennial challenge for us whenever we release the results of our studies is how we could laymanize the terms," he lamented.

Meanwhile, University of Sao Paolo Professor Jacqueline Pontes-Monteiro emphasized in the same forum that the big challenge today is how to put together all the vast quantity of data available. "Only when we optimize nutritional knowledge can we do better nutrition counselling, not exactly personalize it, because we understand more what is going on in each individual. And then we will formulate better dietary guidelines," said Monteiro who has been in clinical nutrition for 30 years.

In Touch with their Mission: Scholars reveal

By ESPIE ANGELICA A. DE LEON
S&T Media Service, *DOST-STII*

Ernest Nathan Nogales while delivering his message


Dion Melosantos


Nhoriel Toledo


Dr. Ruby Raterta

Some of the scholars pose for a groupie *(Photos by Gerry G. Palad, S&T Media Service)*

WHEN ERNEST Nathan Nogales came up onstage to deliver his message to his fellow DOST-SEI scholar graduates who were feted for their outstanding academic achievement in "In Touch with Excellence" at PICC last July, he echoed the Department's vision for its scholars.

"Think about serving the people," the UP Diliman BS Chemical Engineering Summa Cum Laude graduate reminded them. "…not out of duty, but out of love. I assure you there is lasting happiness in there."

The young man then enumerated the various problems faced by ordinary Filipinos such as Metro Manila's transportation woes and the absence of electricity in some areas, and how scholars like him can help improve these conditions.

His audience heard him, lapping up his words and the humor - with his short message so effectively written with a sprinkling of modern-day lingo to best capture the attention of his mostly young listeners, and so eloquently spoken by a young man whose maturity belies his age.

"As DOST scholars, we can advance our economy and improve our people's lives," he said.

their thoughts

Dr. Ma. Neda Catalma

Nogales was not the only one in the room with these thoughts.

His own father, Elpidio Nogales Jr., takes the objective of the scholarship to heart and eggs him on in his responsibility as a scholar.

"Sana po ang anak ko ay maglingkod sa bayan dahil ang ginastos po na pera para sa pagpapa-aral niya, ay galing po sa ating mga kababayan. Kaya sana ay ipagpatuloy ng DOST ang kanilang pagsuporta sa mga batang magagaling (I hope my son will be able to serve the country since the money spent for his studies came from our countrymen. I hope DOST will continue its support for our intelligent young people)," said Mr. Nogales whose other child is also a DOST scholar like Ernest.

Dion Melosantos, who graduated magna cum laude with a degree in BS Computer Science from UP Diliman, told S&T Post, "As of now, I'm considering going to work first and gaining experience in the field, then probably after five or so years, I'd be able to identify a certain field or certain problem which I want to solve, and then I'll go back to school to research for the betterment of S&T in the Philippines."

His mother Lynn, a senior science research specialist from PHIVOLCS, couldn't agree more. "Lahat ng opportunity, nasa iyo. Sana gamitin mo ito ng maayos, para itaas ang antas ng kalidad ng pamumuhay ng mga Pilipino (You have all the opportunities. I hope you will use these properly, to uplift the quality of life of Filipinos)," she reminded her son. "Bring back projects, or bring back some big money for the Philippines," she proudly cheered him on.

For Dr. Ma. Neda Catalma who earned her PhD in molecular biology and biotechnology cum laude from UP Los Baños, the DOST scholarship gave her the chance to exercise her mind and think "based on the realities of how are we going to help our people using our technical skills and to mentor new batches of students – the younger ones – to encourage them to take up S&T and [do] what they can do, using S&T, for our country."

Dr. Catalma revealed that she wants to combine S&T with business, by engaging in bio-entrepreneurship.

Like Dr. Catalma, others like Nhoriel Toledo who finished cum laude with a degree in BS Math for Teachers from UP Diliman, Dr. Ruby Raterta who also graduated cum laude with a PhD in Biological Sciences from UST, and Dion, affirmed how the scholarship itself motivated them to study hard and get good grades, and that it will surely boost their careers.

Nogales finished his message by saying that the Philippines may lag behind other countries for now, but expressed his belief that with support from the government, the country can be at par with the rest of the world. "In no time," he claimed, "we will be world class."

Indeed, Ernest Nathan Nogales may have stood out that afternoon for achieving the highest honors and for his witty and well-received speech which he himself penned. Yet, his thoughts, as reflected in his message, are no different from those of his fellow scholars and their parents: That the essence of being DOST scholars is to use their God-given intelligence, skills, and education for the betterment of the country.

As DOST Undersecretary for Scientific and Technological Services Dr. Rowena Cristina L. Guevara said in her inspirational message, "One scientist can impact 10,000 lives."

Around 239 undergraduate, MS, and PhD scholars under SEI's various scholarship programs were honored during "In Touch with Excellence" which was one of the activities during the National Science and Technology Week.

According to DOST Sec. Mario G. Montejo, the number of slots for undergraduate scholarship offered by DOST has more than tripled in five years, jumping from 1,250 in 2010 to 5,595 in 2015.

In addition, DOST is now producing an average of 350 masteral and 35 doctorate graduates in priority science and engineering courses annually.

Pisay studes bag gold, still undefeated champs in ASEAN Science Odyssey

By MARCO D. MELGAR
S&T Media Service, *DOST-SEI*

UNDEFEATED | The Philippine Team composed of six students from Eastern Visayas and CARAGA Region campuses of the Philippine Science High School maintained the undefeated slate of the country in its four-year participation in the APTJSO. Also in the photo are Dr. Josette Biyo, Director of the Science Education Institute, and Dr. Alexander Lim, Assistant Director and Head of Science and Technology Division of the ASEAN Secretariat

THE PHILIPPINE Team represented by Pisay students wins the overall award to emerge as the undefeated champion for four straight years since 2012 in the recently concluded 4th ASEAN Plus Three Junior Science Odyssey (APTJSO) held in Tangerang, Indonesia.

Six students from Eastern Visayas and CARAGA Region campuses of the Philippine Science High School or Pisay made their mark in performing laboratory experiments in Biology, Chemistry, Physics and Innovation, beating teams from 13 other countries including 10 ASEAN-member countries, plus Sweden, Taiwan, China, and Korea.

Their winnings include a gold medal and an honorable mention in Physics, a silver medal in Biology, a bronze medal and an honorable mention in Chemistry, and a bronze medal and an honorable mention in Innovation. The team also won one gold and one silver in the Project Presentation Category, and an honorable mention in Poster Presentation.

The Philippines has been the champion for four straight years since the APTJSO started in 2012 in Brunei Darussalam, and maintained their feat in Korea in 2013 and in Thailand in 2014.

Indonesia's Agency for the Assessment and Application of Technology (BPPT) through Geostech, located at PUSPIPTEK, a science complex that houses laboratories and other facilities related to technology assessment and application, provided the state-of-the-art laboratory facilities. Students and teachers also toured the Baruna Jaya IV, a marine research and survey vessel of the BPPT, and were given lectures on Indonesia's marine biodiversity and the various projects undertaken to protect the marine environment.

In 2016, the Philippines will be hosting the 5th APTJSO as its share in nurturing gifted students in the sciences from the ASEAN region as well as from other countries. The ASEAN Center for the Gifted in Science (ACGS), based in the Republic of Korea, is the overall organizer of the competition, in cooperation with the ASEAN-member countries, China and Japan.

Dr. Urduja A. Tejada

DOST's new Assistant Secretary and Program Manager for Countryside Development

By DIANARA WANG ANGELES
S&T Media Service, *DOST-STII*

DR. URDUJA A. Tejada, former regional director of Department of Science and Technology-Region II, is the new assistant secretary and program manager for countryside development at DOST. Dr. Tejada took her oath for the position before Secretary Mario G. Montejo last August 19, 2015 at the DOST Central Office, Taguig City.

She began her outstanding government service at Philippine Cotton Corporation - Cagayan as Agricultural Credit Assistant from 1981 to 1982, then Agricultural Development Coordinator at Cagayan Integrated Agricultural Development Project from 1982 to 1984. From August 1984, she started working as Planning Officer II at the National Science and Technology Authority, now the DOST, in Tuguegarao, Cagayan. After 22 years of excellent government service, Dr. Tejada became the Regional Director at DOST Cagayan on November 2006 up to July 2015.

Department of Science and Technology (DOST)-Region 2 Director Dr. Urduja A. Tejada takes her oath as the new Assistant Secretary and Program Manager for Countryside Development of the DOST before Secretary Mario G. Montejo last August 19, 2015 (*Photo by Gerardo Palad, S&T Media Service, DOST-STII*)

As part of her development, she participated in various international trainings and seminars such as Mission on HALAL Food Processing Industries (Kuala Lumpur, Malaysia), Mission on Small and Medium-sized Enterprises (Germany and Netherlands), and enhancement of DOST's capabilities in supporting the development of the Philippine food processing industry (Taiwan).

She also conducted the following researches: Effect of Herbals on the Growth of *Aspergillus flavus* Link In-Vitro (with R.B. Santos) in 1991; Effect of Some Cultural Management Practices on the Growth of *Aspergillus flavus* in the Peanut Fruiting Zone (with R.B. Santos) in 1992; and Effect of Compost Fungus Activator on the Growth of *Aspergillus flavus* in the Peanut Fruiting Zone (with R.B. Santos) in 1993. Dr. Tejada also published articles such as Science Education in the New Millenium, CCT Journal, Volume III, No. 02; Performance of Batch 2000 Pupils in the Engineering and Science Education Program's Special Science High School Admission Test; and Economic Analysis of Climate Change Adaptation Options in Selected Coastal Areas of Cagayan, the Philippines, Kuroshio Science, Volume 8, No. 1 September 2014, pp 87-99. Further, she also authored manuals on Statistics in Social Science Research and Conducting Investigatory Project.

Dr. Tejada also was successful in creating community-based projects which resulted in employment generation and showed income increase of small fisher folks. Her aquaculture projects that address the improvement of fish production capacity of the entire Region 2 had established 10 hatcheries, 65 grow-out ponds, and two fish feed mills and training center fish-based products. In addition, the region's peanut industry was revived and successfully expanded its production particularly in Jones, Isabela and was also cited for improvement of coconut-based products in the region. She was also known for empowering women by initiating the project Harnessing Appropriate Technologies to Assist Women, dubbed as HATAW wherein it produced at least 25 successful women entrepreneurs.

These efforts earned her various awards and recognitions, one of which is the Best Office in DOST System as team leader in 2013. She was also awarded the GAWAD Career Executive Service Officer in 2010 for successfully implementing community-based projects.

Dr. Tejada obtained her BS in Agricultural Administration degree major in Agricultural Economics at Gregorio Araneta University Foundation which is now the De La Salle- Araneta University and pursued her master's degree (Public Administration) at the University of St. Louis Tuguegarao. Under the DOST Scholarship Program, she later took her PhD in Agricultural Science Major in Crop Science at Isabela State University.

CALABARZON journalists level up in science reporting

By ROMELIE JANELLE MARANAN
S&T Media Service, *DOST-STII*

LOS BAÑOS, LAGUNA- Forty-six local media practitioners from Laguna, Batangas, Cavite, Rizal and Quezon participated in the first ever science journalism seminar of the Department of Science and Technology-CALABARZON Region (DOST IV-A) held recently at the Harana Pavilion of Splash Mountain Resort in Los Baños, Laguna.

Dubbed Media and S&T Convergence: Effective News Reporting, the seminar aims to enhance the quality and maximize the number of S&T news that circulates in Region IV-A and other neighboring provinces by fuelling local and regional media with core knowledge in disseminating S&T information.

Philippine Science Journalists Association and AGHAM, Inc. President Angelo B. Palmones speaks to DOST IV-A's Science Journalism Seminar participants composed of different local media around CALABARZON. *(Photos by Ceajay N. Valerio)*

"We are aware that many science journalists do not have degrees in the scientific disciplines they cover," said DOST Assistant Secretary Raymund Liboro in his opening message, delivered by Dr. Aristotle Carandang, chief of the Communication Resources and Production Division of DOST's Science and Technology Information Institute (STII).

"Regardless of background, though, it is always a good practice for all science journalists to formulate and answer deceptively simple questions such as 'What does this mean to Mang Juan and Aling Maria?,' because they can go a long way in developing useful materials for their respective readers," Liboro stated in his message.

According to Dr. Carandang, the state of science journalism is gloomy not only in the Philippines, but also around the world. "Science is actually called a 'dead beat' because it doesn't really sell," said Dr. Carandang. "There is a tremendous decrease in number of science journalists today, especially in traditional media, and we have to address it immediately. There is a need to unleash the science journalist in us, and with the help of our resource speakers, we'll know what to do," he added.

Meanwhile, GMA News Online SciTech Editor Timothy James Dimacali reminded the audience not to be afraid to ask questions when writing their story, and to consider the basics in journalism for people to easily grasp their report.

In addition, Philippine Science Journalists Association and AGHAM, Inc. President Angelo B. Palmones mentioned that if S&T consciousness could reach the grassroots, the process of development could be achieved.

The newly elected Tambuli Media Network officers of DOST IV-A with DOST IV-A Assistant Regional Director for Technical Operations Dr. Lydia S. Manguiat (2nd from left), DOST IV-A Regional Director Dr. Alexander R. Madrigal and DOST-STII CRPD Chief Dr. Aristotle Carandang (5th and 6th from left).

From left: DOST IV-A Assistant Regional Director for Technical Operations Dr. Lydia S. Manguiat, GMA News Online SciTech Editor Timothy James Dimacali, news reporter and DZRB broadcast journalist Melly C. Tenorio, Chief of the Communication Resources and Production Division (CRPD) of DOST-STII Dr. Aristotle Carandang, Philippine Science Journalists Association and AGHAM, Inc. President Angelo B. Palmones, and the master of ceremony Juan Carlos Manas during the Science Journalism Seminar of DOST IV-A.

DZRB news reporter and broadcast journalist Melly Tenorio, on the other hand, discussed how media frames science news, and the difference of science reporting for broadcast and print media.

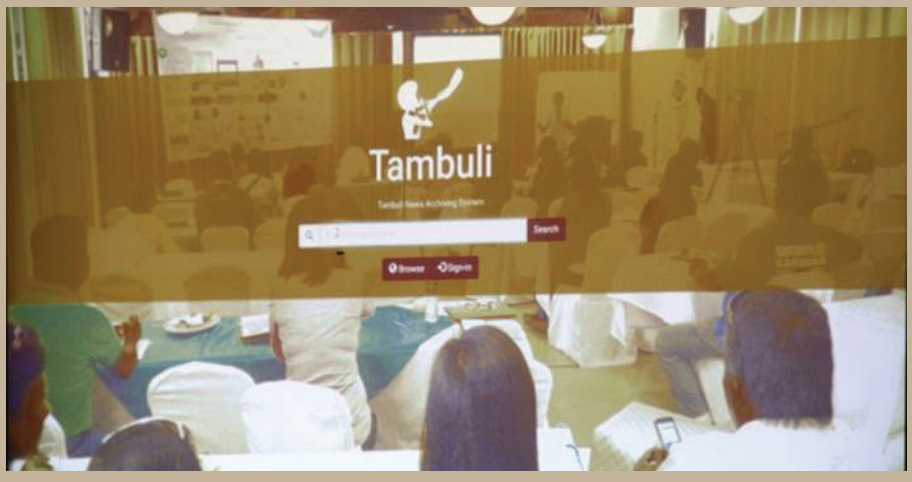
Subsequent to the event was the election of new officers for DOST-CALABARZON's Tambuli Media Network which is expected to expand the number of readers, listeners, and viewers of DOST's S&T news.

The newly elected officers are: Zen Trinidad of Philippine News Agency IV-A (President); publisher Marie Grace Managa (Vice President); Josephine Escovidal of MAGIC Media Against Graft Illegalities Corruption Expose News (Secretary); Francia Orlain of Cavite Times Journal (Assistant Secretary); Ester Catalan of DZJV 1458 (Treasurer); Rebecca Velasquez of Pulso Cavitenyo (Assistant Treasurer); Rommel Madrigal of Balitang Pinoy, Saksi, and Bomba (Auditor); Daniel Castro of DZJV 1458 (Business Manager); and Guillermo Victoria of Southern Luzon Newstar (Sergeant-at-Arms).

"I hope that each of you will continue to be our partners in propagating science and technology information to the public. Likewise, we guarantee to continue providing S&T services to each Filipino," DOST-CALABARZON Regional Director Dr. Alexander Madrigal concluded.

ROMELIE JANELLE MARANAN

NEWS ARCHIVING SYSTEM IN CALABARZON LAUNCHED | Department of Science and Technology- CALABARZON (DOST IV-A) Regional Director Dr. Alexander R. Madrigal launches the Tambuli Media Network News Archiving System, the first news archiving system created to promote science and technology news of DOST IV-A. Developed by the regional office's Management Information System, the Tambuli Media Network News Archiving System provides online storage that will enable CALABARZON's local media partners to upload news stories and activities. The system also serves as a venue for discussions and S&T information dissemination among media members. On left is a screen capture of the system's homepage. (Text by Romelie Janelle Maranan/Photos by Ceajay N. Valerio, S&T Media Service)



Negrenses in food industry get trained on food safety and meal management

By SEAN ADRIAN T. GUARDIANO & ROSLYN D. TAMBAGO
S&T Media Service, *DOST PSTC Negros Oriental*

Local food service operators and crew are reminded to make food safety a top priority in their day-to-day business operations in order to protect the health and well-being of customers.

IN THE wake of recent news on the alarming rise of food poisoning in the country, the Department of Science and Technology through its Negros Oriental Provincial Science and Technology Center (PSTC) trained some 60 food processing company owners, food service operators and crew, and street food vendors in said province.

The participants were updated on food safety practices through a series of training-workshops on Basic Food Hygiene and Current Good Manufacturing Practices (cGMP) for DOST-Small Enterprise Technology Upgrading Program (SETUP) Beneficiaries, and on Meal Management and Basic Food Safety for food service establishments held a week later, both in Dumaguete City.

About 20 participants, from 12 food processing firms participated in the first series of lecture-training on the importance of food safety, prevention of foodborne diseases, proper hygiene and sanitation, among others. Negros Oriental Food Safety Team led by Gemma Kitane with Joyce Maputi, Analiza Bais, Evelyn Fajardo, Erlinda Vilan, and Geraldine Quiñones conducted the training.

Meanwhile, a total of 40 participants from 26 food service establishments attended the second series. The participating organizations, which operate catering services, canteens, or street food stalls in Dumaguete City, included six business firms, nine schools, and 11 people's organizations. Josefina T. Gonzales and Jerlyn D. Avilla of the DOST Food Nutrition and Research Institute (FNRI) served as resource persons and elaborately discussed basic nutrition, meal and menu planning, food buying and storage, food preparation, food costing and control, food safety and sanitation as well as an overview of FNRI's programs and projects.

"The real mistakes can happen at any step in the flow of food through the facility from receiving, storage, preparation, cooking, holding, cooling, reheating or serving," said Gonzales, adding that food safety must be the top priority of any business.

The facilitators stressed that nutrition is as equally important as food safety in food preparation and showed the application of these principles through cooking demonstrations, which featured recipes such as squash fish balls, squash ukoy (shrimp fritters), squash maja, and squash kutsinta. The workshop also engaged the participants in proper presentation of finished products.

The training series is part of the DOST's initiatives in line with the Food Safety Act of 2013 or the Republic Act 10611, a law that aims to strengthen the food safety regulatory system in the country to protect consumer health and facilitate market access of local food and food products and for other purposes. The Act provides a legal framework requiring food manufacturers and processors to implement traceability systems.

ROSLYN D. TAMBAGO

SEAN ADRIAN T. GUARDIANO

DOST-SLC takes the LEAP to BPO success

By CYD FRANCIS D. RECIDORO
S&T Media Service, *DOST-MIMAROPA*

DR. ROWENA Cristina L. Guevara, Undersecretary for Scientific and Technological Services of the Department of Science and Technology (DOST), led the hand-over of the Learning English Application for Pinoys (LEAP) to the DOST South Luzon Cluster (SLC)—comprised of the DOST regional offices from the MIMAROPA Region, CALABARZON Region, Central Luzon Region, Bicol Region, and National Capital Region—during the press conference held for the 2015 South Luzon Cluster Science and Technology Fair and Exhibits in Puerto Princesa City on August 17, 2015. Among the 16 regional offices, the SLC Regional Offices were the first recipients of LEAP since its unveiling at the 2013 National Science and Technology Week celebrations.

DOST-MIMAROPA Regional Director Dr. Ma. Josefina P. Abilay (leftmost), together with the region's Provincial Science and Technology Directors (PSTDs), are all smiles after DOST Undersecretary Dr. Rowena Cristina L. Guevara (rightmost) hands them copies of the Learning English Application for Pinoys(LEAP), an English language training software targeted mainly for high school and early collegiate students, and developed mainly to meet and sustain the demands of the country's BPO industry.

Usec Guevara hands over the LEAP software to (from left) Dr. Lydia Manguiat of DOST-CALABARZON, Jose Patalinjug of DOST-NCR, Engr. Jacinto Alexis Elegado of DOST-V (Bicol Region) and Dr. Victor B. Mariano, regional director of DOST III (Central Luzon).

LEAP is a stand-alone, computer-based, 200-hour English training program that helps target users—mainly Filipino high school and early collegiate students—improve critical areas of their English language skills from vocabulary and grammar, to speech. The software was developed through the collaboration of the University of the Philippines-Diliman College of Engineering's Electrical and Electronics Engineering Institute (EEEI), Department of Computer Science (DCS), College of Arts and Letters' Department of English and Comparative Literature, and the Department of Speech Communication and Theater Arts, under the DOST-funded project "Interdisciplinary Signal Processing for Pinoys (ISIP) Project 7: Development of an English Language Training Software for Call Centers."

Filipinos are widely regarded around the world as some of the most competent English language users. Indeed, in 2010 the Philippines was ranked 35th out of 163 countries worldwide based on Test of English as Foreign Language (TOEFL) scores. The only other Asian countries that ranked higher were Singapore and India, placing 3rd and 19th, respectively, while South Korea, China, and Japan placed lower at 80th, 105th, and 135th, respectively *(http://www.huffingtonpost.com/amy-chavez/what-asia-can-learn-from-_b_4572991.html)*. On the other hand, in 2013, Global English Corporation ranked the Philippines as the best in the world in terms of business English proficiency, scoring 7.95 in Business English Index (BEI), beating even the United Kingdom (6.81), Australia (6.78), and the United States (5.23) *(http://www.globalenglish.com/company/press/releases/899)*.

Our proficiency with the English language has made us the top destination for Business Process Outsourcing (BPO). Surprisingly, however, as much as the BPO industry continues to flourish, and with the advent of "Next Wave Cities"—or IT hubs outside of Manila, as defined by the DOST-Information and Communications Technology Office (DOST-ICT Office)—the hiring rate of Filipinos in the BPO industry is only around 3% to 8% *(http://www.upd.edu.ph/~updinfo/aug13/articles/UPD_DOST_launch_LEAP.html)*.

With LEAP as an effective tool in refining English communication skills, it is expected that Filipinos will improve on and continue to meet the demands, not just of the BPO industry, but also of the other industry sectors in today's global workplace as a whole.

DREAM for a disaster-prepared Puerto Princesa City

By CYD FRANCIS D. RECIDORO
S&T Media Service, *DOST-MIMAROPA*

Puerto Princesa City Mayor Lucilo R. Bayron (center) holds the hard copy of the LiDAR Digital Elevation Model map of Puerto Princesa City with DOST-PCIEERD Director Dr. Carlos Primo C. David. With them are (from left) DREAM Program Leader Dr. Enrico C. Paringit; DOST-MIMAROPA Regional Director Dr. Ma. Josefina P. Abilay; Assistant Secretary for Climate Change and Disaster Risk Reduction Raymund E. Liboro; Officer-in-Charge, Office of the Assistant Secretary and Program Manager for Countryside Development Dr. Urdujah A. Tejada; and Undersecretary for Scientific and Technological Services Dr. Rowena Cristina L. Guevara.

ONE OF the Department of Science and Technology's (DOST) 8 Outcomes focuses on providing "Science-based information on weather, climate change and geological hazards to ensure the country's survival and future in an era of extreme and rapidly changing climate". (S&T Post, Vol. XXXI No. 4)

The city of Puerto Princesa and the province of Palawan, just like all the other cities and provinces in the Philippines, is not immune to the ill effects of climate change.

In efforts to strengthen the city government of Puerto Princesa's disaster risk reduction and management initiatives, Dr. Enrico C. Paringit of the DOST Disaster Risk and Exposure Assessment for Mitigation (DREAM) Program—a vital component of DOST's Nationwide Operational Assessment of Hazards, or Project NOAH—turned over three-dimensional (3D) fine-resolution maps, as well as a CD containing digital elevation models of the city, created using Light Detection and Ranging (LiDAR) technology, to Puerto Princesa City Mayor Lucilo R. Bayron on August 17, 2015 during the press conference for the 2015 South Luzon Cluster Science and Technology Fair and Exhibits held in the city.

DREAM's Dr.Paringit explains the importance of LiDAR data in enhancing the government's disaster risk reduction and management initiatives.

The DREAM Program was formed in 2011 "in response to the echoing need to better prepare the country and its people for natural disasters". The program deals with "producing up-to-date, detailed flood hazard maps for the critical river basins in the Philippines" guided by the vision of "resilient Filipino communities enabled to rise above any disaster and environment-related challenge, with the capacity for continuous improvement."

CYD FRANCIS D. RECIDORO

DOST, ADMU eHATID project reaches Negros Oriental

By SEAN ADRIAN T. GUARDIANO
S&T Media Service, *DOST PSTC Negros Oriental*

Dr. Dennis B. Batangan (extreme left) of Ateneo de Manila University and Atty. Gilbert R. Arbon (second from left) DOST Negros Oriental Provincial S&T Director hand over tablet computers to Zamboanguita municipal health officer and Mayor Kit Marc B. Adanza.

AN ELECTRONIC health information support system developed to help local government units (LGUs) make informed decisions on health concerns recently reached the province of Negros Oriental.

The Department of Science and Technology (DOST), in partnership with Ateneo de Manila University-School of Social Sciences, introduced to local government units (LGUs) of the province, as well as nearby provinces including Negros Occidental and Siquijor, the eHealth Tablet for Informed Decision (eHATID), a software that offers real-time access to health information. Designed for LGUs and medical doctors, the software runs on mobile android devices.

The orientation and ceremonial turnover of the eHATID tablets with pre-installed health-related information, particularly patient records, were held recently in Dumaguete City.

"The project provides local government officials with an electronic medical record mobile application that generates reports for the Philippine Health Insurance Corporation (PhilHealth) and Department of Health (DOH), and also guarantees a more efficient patient record system that will save time and effort for both health workers and patients," Ateneo Project Director Dennis Batangan said.

"The eHATID LGU will also have a security feature that requires a username, password, client's secret four-digit PIN for data security, privacy and confidentiality purposes to access the account offline," he added.

Aside from this, data from the application will also be transmitted and synched to a central database via government cloud facilities of the Advanced Science and Technology Institute (ASTI) of the DOST.

Health workers can use the tablet offline to input patient records and then synch the encoded information to government cloud facility later in case the Internet service is unavailable or intermittent.

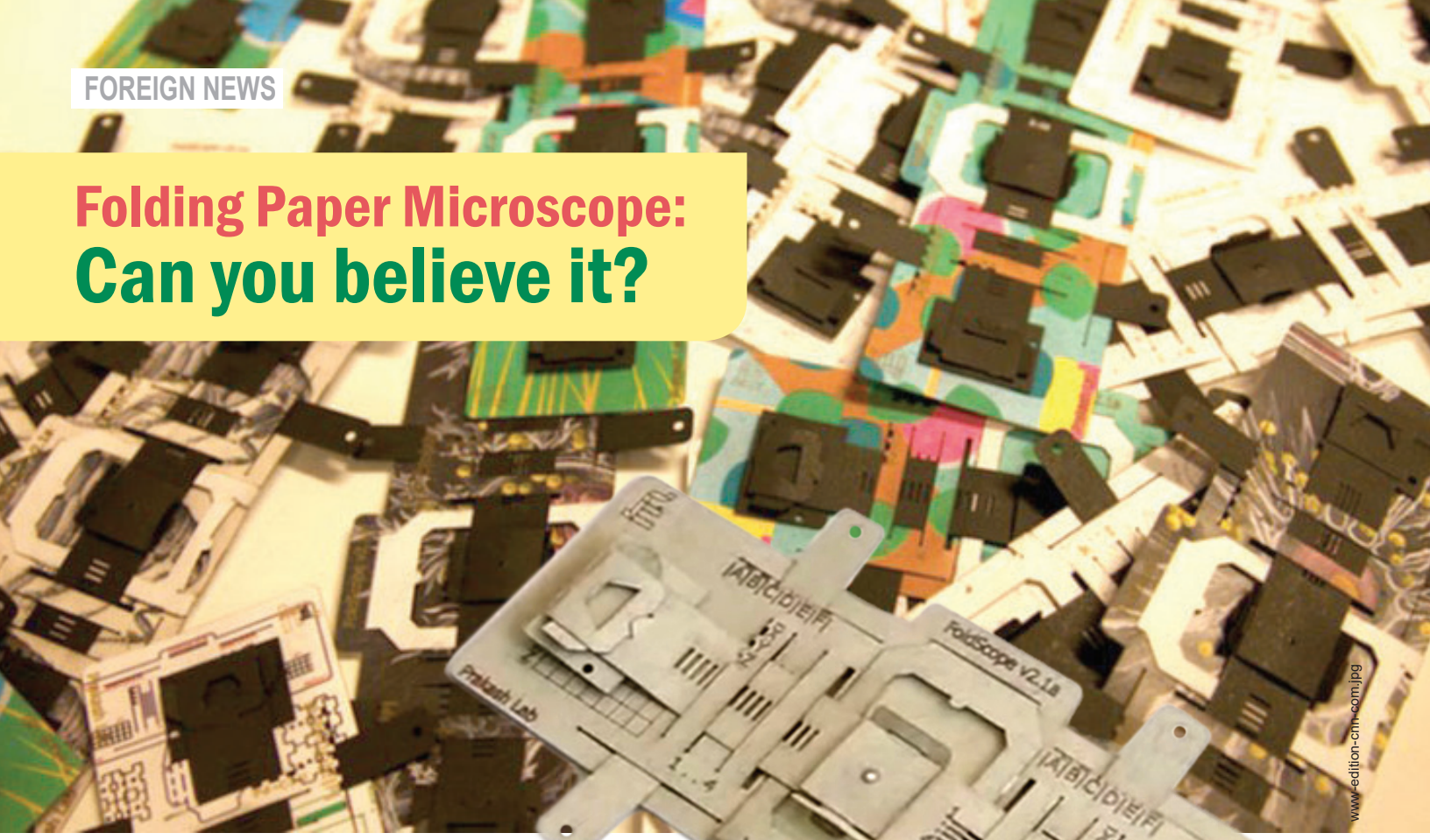
Concurrent to the introduction, the DOST and its partners distributed two Lenovo tablets (intended for mayor and health officer's use) to each LGU to make the project more fruitful.

The Memorandum of Understanding states that stakeholders must maximize the use of the application and secure the physical aspects of the gadget. It is also stated that every LGU must designate a data encoder to sustain the project.

A total of 58 participants attended the training from 29 respective LGUs including Hinoba-an in Kabankalan City and Maria, Lazi and San Juan in Siquijor.

The eHATID LGU project is funded by the DOST's Philippine Council for Health Research and Development (PCHRD) in partnership with Ateneo de Manila University.

Folding Paper Microscope: Can you believe it?



http//geeky.gadgets.com

OBSERVING ANIMAL or plant cell is made fun and easy with the new invention of Manu Prakash of Stanford University — the Foldscope.

Dubbed as microscopy for everyone, the Foldscope is an origami-based print-and-fold optical microscope that can be easily assembled from a flat sheet of thick paper. Even kids can enjoy themselves putting it together.

The research team at Stanford's Prakashlab described Foldscope as a new approach for mass manufacturing of optical microscopes.

Furthermore, the Foldscope is very convenient since it is small enough to fit in a pocket with its size of 70 x 20 x 2 mm3. Also, it only weighs less than two coins which is 8.8 g and it doesn't require external power to function. Surprisingly, it can survive after being stepped on or after dropping from a three-story building.

The paper, lens, and other parts cost about 50 cents (or Php24) according to Stanford, yet it doesn't compromise its capacity to provide over 2,000x magnification.

Aaron Pomerantz, entomologist and science reporter who used the Foldscope in the Peruvian Amazon Forest, wrote on his site that he was able to investigate tiny insects, mites, fungi, and plant cells from 140X to 480X magnifications.

Meanwhile, Prakash and his team distributed 10,000 Foldscopes to users wanting to test and see the device for themselves. The users, who included grade one students examining banana seeds and those detecting parasitic worms in fecal samples, are now submitting their findings to the Foldscope site.

Stanford wants all kids to have a microscope inside their pocket and this gave birth to the invention of the Foldscope. Likewise, Prakash hopes that it can be the best possible tool for quick, cheap, and safe detection of blood borne disease by health care workers.

"What came out of this project is what we call use-and-throw microscopy," he said in a Stanford blog post last year.

As of now, the Foldscope is currently unavailable. However, the team said that they are trying and working hard to make the microscopes reach the market and be commercially available thru spinoff or startup.

Sources:
http://edition.cnn.com/2015/09/08/tech/paper-microscope-feat/index.html
http://www.foldscope.com/

NASA picks finalists in 3-D Mars shelter design competition

NASA HAS announced the top three entries in the first stage of its "3-D Printed Habitat Challenge Design Competition", awarding the teams a total of $50,000 during the New York Maker Faire last Sept. 27, 2015.

The competition, part of NASA Centennial Challenges program, sought architectural designs for how 3D printing might be used to build shelters on Mars using available resources in the planet.

Out of 165 submissions received by NASA, the 30 highest scoring designs were judged and showcased at the Maker Faire event.

Designed by Clouds Architecture Office and Space Exploration Architecture, the Mars Ice House won first place, receiving a total of $25,000 for the team behind it. The Ice House concept utilizes the abundant water and low temperatures in Mars' northern latitudes for a multi-layered pressurized shell of ice.

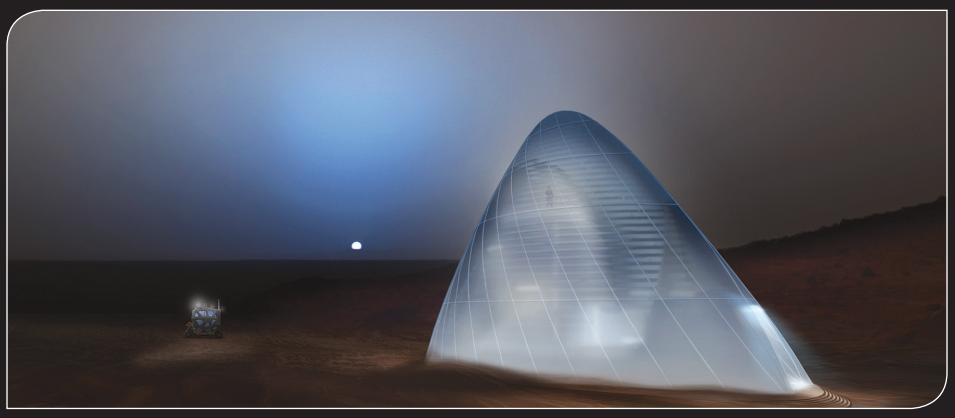
Second place went to Team Gamma, who also grabbed the People's Choice Award, thus copping $15,000 in prize money.

Third place honors went to Team LavaHive with $10,000. LavaHive is a modular, additive-manufactured habitat using the "lava-casting" construction technique and recycled spacecraft materials.

The entries were judged on architectural concept, design approach, habitability, innovation, functionality, Mars site selection, 3D print constructability, and other factors.

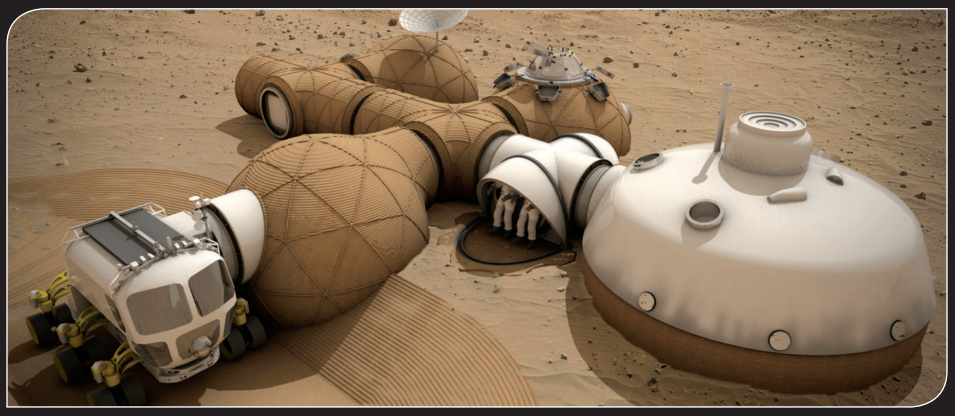
"The creativity and depth of the designs we've seen have impressed us," said Centennial Challenges Program Manager Monsi Roman. "These teams were not only imaginative and artistic with their entries, but they also really took into account the life-dependent functionality our future space explorers will need in an off-Earth habitat."

Sam Ortega, also of NASA, added "The future possibilities for 3D printing are inspiring, and the technology is extremely important to deep space exploration. This challenge definitely raises the bar from what we are currently capable of."



Mars Ice House

Team Gamma's Entry



Team Lava Hive's entry

The second stage of "3-D Printed Habitat Challenge Design Competition" is divided into two levels: the Structural Member Competition which focuses on fabrication technologies for manufacturing structural components using indigenous materials and recyclables; and On-Site Habitat Competition which focuses on the fabrication of full-scale habitats.

Sources:
https://www.nasa.gov/directorates/spacetech/centennial_challenges/3DPHab/2015winners.html
http://makezine.com/2015/09/27/nasa-winners-3d-printed-habitat-challenge/

Project Almanac

By ABIGAIL RUTH BATALON &
DIANARA ANGELES
S&T Media Service, *DOST-STII*

hdpower1st.com

PROJECT ALMANAC is a science-fiction movie directed by Dean Israelite.

The movie's main character is David Raskin (Jonny Weston), a high-school science genius and aspiring inventor whose ambition is to attend the Massachusetts Institute of Technology. When he and his friends Quinn and Adam (Sam Lerner, Allen Evangelista) discover his late father's plans for a "temporal displacement device" in the basement, David can't wait to convene and assemble it.

The "temporal displacement device" is basically a time machine which takes photos 24 hours into the future. It was the brainchild of his own father, himself an inventor, and who conceptualized it for the US military.

When they finally get the device to work after testing it multiple times, the teenagers grab the chance to control time for their benefit. However, the fun is temporary as they begin to discover how dangerous time travel can be.

Given the premise that famous time travel themed movies have been shown before, Project Almanac presents its viewers – especially the huge number of science fiction fans who were intrigued by the film by the time its trailer was released – with an inquisitive atmosphere and a very interesting and well-established concept. Constructed with a good plot, the movie raises issues about how acquiring power to manipulate time could change the past, present and future of one's life and how these phenomena could affect others and the one responsible for it since the beginning.

The concept of time travel might be difficult to grasp and in reality, it is impossible that a traveller can go back in time.

According to J. Richard Gott, author of the book Time Travel in Einstein's Universe and a professor of astrophysics at Princeton University, "Time machines to the past are projects only a super civilization could attempt," said Gott. "It would require a civilization that has the resources of the galaxy at its command."

On the other hand, Stephen Hawking who is an English theoretical physicist, cosmologist, author and Director of Research at the Centre for Theoretical Cosmology within the University of Cambridge, believes in time travelling. "But the story's not over yet. This doesn't make all time travel impossible. I do believe in time travel. Time travel to the future. Time flows like a river and it seems as if each of us is carried relentlessly along by time's current," he said.

In the perspective of science, the first thing to observe is that the film makes time travel seem realistic and it is pretty persuasive. The special effects seen in the movie are really convincing. Yet, despite these, this aspect can never be applied in reality.

If I were to go back in time and change some things about the Project Almanac movie, these things would be:

(1) Disturbing camerawork. The footage filmwork technique and camera movements applied in Project Almanac are shaky and nauseating which caused annoyance among the viewers.

(2) Character Development. The plot is really good and the sequence of the story is well driven but the pacing focuses more on the several trials the characters undertook with the time travel device, making the movie a bit boring in specific parts. Also, the movie does not substantiate the background of the main characters except the lead actor David Raskin.

All in all, Project Almanac is an average sci-fi movie. It is not as extreme as what it seems in the trailer and might not meet one's expectations. The movie could have been above average if they (director and production staff) spent more time discovering the various effects of time travel.

But still, Project Almanac is a good movie worth viewing with a bucket of fresh popcorn.

S&T Post welcomes contributions for our Movie Review section. Please email your contributions to eadeleon.dost@gmail.com. Reviews should tackle the movie's science and technology component, subject to the approval of the Executive Editor. For inquiries, call 837-2191 local 107 and look for Gigi de Leon.

WATER OF LIFE | DOST Secretary Mario G. Montejo (top photo, 2nd from left) turns over 200 units of the DOST innovation on water treatment system called the Portable Ceramic Water Filter (Pitcher Type) to recipients represented by staff of the Cultural Affairs Department and Department of Social Welfare and Development of Vigan City, Ilocos Sur during the recent Northern Luzon Cluster Science and Technology Fair held on September 1, 2015 at the Tadena Hall, University of Northern Philippines (UNP). Witnessing the turnover is Dr. Gilbert R. Arce (left), UNP president. The ceramic water filter is portable and uses red clay filtering agent with nanotechnology silver coating with anti-microbial feature. Through the principle of gravity, the two-liter capacity water filter can sift tap or deep well water using red clay with nanotechnology silver coating as the main filtering agent. Red clay is abundant in the Ilocos region. **(Text by Rodolfo de Guzman, Photo by Gerardo Palad / S&T Media Service, DOST-STII)**

2015 Global Forum on Research and Innovation for Health

Council on Health Research for Development (COHRED) Executive Director Prof. Carel Ijsselmuiden and Philippine Council for Health Research and Development (PCHRD) Executive Director Dr. Jaime C. Montoya lead the ribbon cutting ceremony to formally open the poster and photo exhibits. **(Text by Romelie Maranan, Photo by Gerardo Palad / S&T Media Service, DOST-STII)**

"Together, we can find appropriate health solutions from all corners of the world," Department of Science and Technology (DOST) Secretary Mario G. Montejo noted in his welcome remarks as he formally opened the 2015 Global Forum on Research and Innovation for Health last August 24, 2015 at the Philippine International Convention Center. The four-day event gathered about 4,000 delegates from 50 countries, with over 200 speakers and presenters for different forum sessions. The event also featured a variety of global discussion platforms, festival and photo competitions and exhibits, and a global university debating convention, among others. **(Text by Romelie Maranan, Photo by Gerardo Palad / S&T Media Service, DOST-STII)**

WELCOME RECEPTION. | El Gamma Penumbra (left) upholds its winning streak as the champion of Asia's Got Talent as the group performs a heartfelt and action-driven show. Meanwhile, Gwynneth Dorado. **(Text by Lotuslei P. Dimagiba, Photo by Henry A. de Leon / S&T Media Service, DOST-STII)**

Some 400 Asia-Pacific Economic Cooperation (APEC) delegates and participants from 21 countries convened at the Philippine International Convention Center in Manila for the 6th meeting on Policy Partnership on Science, Technology and Innovation on Aug. 10-12. This was followed by the APEC High Level Policy Dialogue on Science and Technology in Higher Education (HLPD-STHE) on Aug. 13-14, also at PICC. (Photo by **Henry A. de Leon / S&T Media Service, DOST-STII)**

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