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S&T POST

OCT - DEC 2015

Montejo bets on biotechnology for food security, better healthcare

DOST-ARMM helps raise organic farming in Mamasapano

Biotech for Progress

EDITORIAL

Celebrating the benefits of biotechnology

Of late, biotechnology has become a hot item. But what actually matters is how ordinary Filipinos would be able to become aware, at very least, about the science behind this somewhat controversial tool. Having them understand and appreciate its benefits would be an unexpected bonus for the advocates.

It should be underscored that the efforts exerted by the communication arm of the Department -- the STII, as well as that of the DOST Councils, are precisely to make the majority of our citizens aware of the science of biotechnology. It can be safely assumed that, based on what's going on, Filipinos are not yet well-informed about biotechnology, especially its benefits to humanity. Thus the observance of the National Biotechnology Week or NBW every last week of November helps boost the information efforts to reach a greater number of Filipinos. The activities featured in the celebration are staged based on Presidential Proclamation No. 1414 signed on 07 November 2007 tasking the DOST, DOH, DA, DENR, DTI, DepEd, and CHED to organize meaningful biotechnology-focused activities annually.

In a nutshell, biotechnology has been around since humans learned how to "appreciate" food, so to speak. Products such as cheese, beer, bagoong or fish paste, nata de coco, etc. are produced using traditional biotechnology. Through this technology, early humans were able to extend the shelf life of food, enhance its flavor, or even develop new food products. Of course, modern methods involving advanced technologies are more complicated and more difficult to understand compared with traditional methods. Undeniably true, however, is the fact that modern biotechnology has helped this modern generation experience better quality of life. This is especially true to those afflicted with illnesses that require vaccines and other pharmaceutical products developed through biotechnology such as insulin for the diabetics and even gene therapy, for example. Applications of modern biotechnology, however, are not limited to health. Biotechnology is also vital in agriculture, industry, and environment applications, among others.

Organizers of this year's NBW said that the celebrations provide the venue to showcase the numerous contributions of biotechnology to agriculture and food security, equitable health care services, development of industries and business enterprises, sustainable environment and economic development, among others. Meanwhile, DOST Secretary Mario G. Montejo said that in every NBW celebration he has witnessed, he could see new ideas and innovative products and that have great impact on improving the lives of Mang Juan and Aling Maria.

Biotechnology in the Philippines indeed is developing very well. Its prospects can already be seen, such as improvement of crops and development of drugs, and, in just a matter of time, will be enjoyed by every Filipino. Thanks to the observance of NBW, we can check out current developments and get a heads-up on future scenarios.

Moreover, our local scientists are encouraged to continue their quest to develop better products using modern biotechnology.

Objectively, the S&T Post editorial team has deemed it appropriate to highlight biotechnology in its 4th quarter issue as everyone envisions bright prospects in the coming year while 2015 draws to a befitting close.

Aristotle P. Carandang, PhD

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Telefax: (02) 837-7520
Tel No.: (02) 837-2071 to 80 local 2148
Email: dost.digest@gmail.com;

Visit:
www.stii.dost.gov.ph

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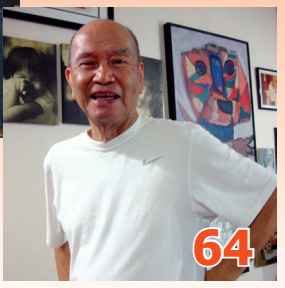
OUR COVER

The cover shows a butterfly perched on a golden rice stalk ready for harvest. The two figures represent the flora and fauna that are improved and preserved using biotechnology. The vivid colors represent the verdant future- one marked by greatly improved quality of life for future generations and revolutionized processes for the industry, agriculture, health, and wellness that are safe for the environment.



ERRATUM

The wrong photo appeared on page 56 of S&T Post's April-June 2015 issue. Shown at left is the correct photo, corresponding to the names in the caption on the said page. That caption read, "PSTD Engr. Mario de la Pena (center, in chequered polo) hands over the check worth P645,000 to Mayor Villa of LGU Larena. Also present in the picture are Vice-Mayor Calibo (3rd from right), Municipal Budget Officer Quilicot (4th from right), Municipal Treasurer (3rd from left) and SB members. The S&T Post editorial board apologizes for this error.

DOST assists local inventors

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

INVENTORS GET DOST SUPPORT From left: Benjamin F. Mendoza (Commercialization of Mosquito Trap); Junior A. de Jesus (Commercialization of Fuel Saving System); Atty. Marion Ivy Decena , invention development division manager of TAPI; Janeth N. Cruzada, IBED program manager; and Melchor L. Heñosa (Pilot Production cum Market Testing of Leak Sealing Valve) during the Memorandum of Agreement Orientation and Signing last December 3, 2015 at the TAPI office, DOST Complex, Bicutan, Taguig. *(Photo by Gerardo De Jesus,* S&T Media Service*, DOST-STII)*

THREE LOCAL inventors recently received financial assistance from the Department of Science and Technology (DOST) through its Technology Application and Promotion Institute (TAPI), under the Invention-Based Enterprise Development (IBED) program of TAPI's invention development division.

A Memorandum of Agreement orientation and signing, spearheaded by Atty. Marion Ivy Decena, TAPI's invention development division manager, was held last December 3, 2015 at the TAPI Conference Room, DOST Complex, Bicutan, Taguig.

Pilot Production cum Market Testing of Leak Sealing Valve for Brake System of Motor Vehicle

Developed in 2010 by Melchor L. Heñosa, the Leak Sealing Valve for Brake System of Motor Vehicle received from TAPI P41,440 for the fabrication of the product.

Leak Sealing Valve

The invention is an anti-loose device attached along the brake fluid pipes of each brake assembly of the wheels of vehicles. It aims to avoid loss of brake in case of brake fluid leak. Each set of the valve is sold for P12,000.

The design of the valve was conceptualized by DOST's Metals Industry Research and Development Center and was patented in 2013. Before availing TAPI's IBED assistance program, the invention was also a beneficiary of the Industry-Based Invention Development assistance program of the same institute.

It was hailed as Outstanding Invention at the 2015 CALABARZON Regional Invention Contest and Exhibit (RICE).

Commercialization of Fuel Saving System for Internal Combustion Engine

To help save fuel usage the environment-friendly way, Junior A. de Jesus, chairman of Topheight, Inc. developed the Highmax Turbo Power Simulator.

The invention received P604,000 from TAPI under the IBED Component 2 for the fabrication and commercialization of the product.

Developed in 2010, the Highmax Turbo Power Simulator is installed between the air filter and intake manifold of vehicles with internal combustion engine. With the device, the air entering the manifold will be filtered and will mix with the fuel at a balance scale, thus making the engine more powerful, saving fuel, and producing cleaner emission. Each 12-volt unit is sold for P7,500 while the 24-volt units are sold for P9,500 with an additional P1, 000 for the installation.

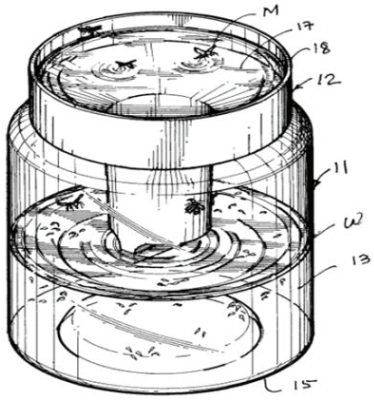
Fuel Saving System

Commercialization of Mosquito Trap

Unlike other mosquito repellers or killers, the mosquito trap developed by Benjamin F. Mendoza, director and president of Filipino Inventors Research System Technologies, Inc., uses no chemical but only water and plastic.

The inventor was granted P480,000 under the IBED Component 2 for the fabrication and commercialization of the product.

Mendoza's mosquito trap is a plastic container designed to attract adult mosquitoes to lay eggs on the water on the first chamber of the trap. The eggs will eventually fall into the second chamber, and then the grown ones will be trapped and will later die due to starvation and lack of air. Each unit is sold for only P15. The invention



Mosquito Trap

placed 1st runner up in the Outstanding Utility Model category of the 2013 NCR RICE.

IBED assistance program is a follow-through action to push and transform inventions into a technology enterprise. Its services include pilot production, field/market testing and formulation of systems and procedures in preparation for a larger production scale.

For more information on assistance for local inventions, you may inquire at the nearest DOST regional office or provincial science and technology centers. You may also log on to http://tapi.dost.gov.ph, or email tapi.dost@yahoo.com.

Mijeno presents SALt Lamp

Filipino engineer, entrepreneur, and Greenpeace volunteer Aisa Mijeno presents her invention "Sustainable Alternative Lighting (SALt) Lamp" during the Technical Evaluation Committee meeting with representatives of the Department of Science and Technology-Technology Application and Promotion Institute (DOST-TAPI) last December 7, 2015 at the TAPI Conference Room, DOST Complex in Taguig. SALt Lamp is an alternative light source which runs on saline solution consisting of only a glass of water and two tablespoons of salt or ocean water that can be used for eight hours a day for six months. The lamp can produce 90 lumens or 2 watts of luminosity through the LED light. It can also be used to charge cell phones in case of emergency. Mijeno's invention, which attracted attention during the recent Asia-Pacific Economic Cooperation Summit in Manila, is currently being proposed for TAPI's Invention-Based Enterprise Development funding assistance program for prototyping and further production. Also shown in photo is Engr. Aisa's brother and business partner Raphael Mijeno (inset). *(Text by Romelie Janelle Maranan; Photo by Ceajay N. Valerio,* S&T Media Service, *DOST-STII)*

Nuclear technology: What's in it for the young?

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

HIGH SCHOOL and college students from different schools in Metro Manila gathered to learn about the challenges and opportunities for the young generation in the field of nuclear science in the First Nuclear Youth Summit held last December 7, 2015 at the Diamond Hotel, Manila.

One of the highlights of the Third Philippine Nuclear Congress, the youth summit provided a forum to share nuclear information and scientific knowledge among the youth as potential leaders and scientists.

The Nuclear Congress was organized by the Department of Science and Technology (DOST) and the Philippine Nuclear Research Institute (PNRI).

In his inspirational message, Hon. Yukiya Amano, director general of the International Atomic Energy Agency (IAEA), told participants that imagination and a high degree of technical competence are vital in the field.

"Some applications of nuclear technology might surprise you," he said.

He revealed that IAEA has helped authorities in Nepal in determining the extent of damage in buildings and structures after the big earthquake using non-destructive testing techniques like radiography which he likened to taking an x-ray of a structure.

He also mentioned that IAEA provided a nuclear-derived technology to Africa during the Ebola outbreak which can diagnose the disease in four hours instead of four days using other diagnostic methods. Such time difference is vital in saving lives and preventing the further spread of the disease, Amano emphasized.

He also commended the Philippines for being a very active member of the IAEA since 1958, adding that more than 300 Philippine nationals have worked under the IAEA Cooperation Program, sharing their knowledge and experience with other developing countries.

Anton Philippe Tanquitic *(Photo by Hans Joshua Dantes)*

Nuclear science and technology will give them the opportunity to contribute to the prosperity of their own country and others, Amano told the students.

Woman leader and scientist

Meanwhile Dr. Alumanda dela Rosa, current PNRI director, shared how she originally wanted to be a teacher but ended up as a government worker/researcher at the then Philippine Atomic Energy Commission (now PNRI) and eventually rose from the ranks. She has been involved in the development of products from polymers using nuclear technology.

Though it enabled her to see the world, she cautioned that the work is not a bed of roses.

Neclear medicine: not just about nuclear accidents

Dr. Teofilo San Luis Jr., a medical doctor set on going into gastroenterology, had a change of heart when he was offered a scholarship in nuclear medicine at the University of Bonn. He took the opportunity.

"Nuclear medicine is a very encompassing field," he said. "Mention any specialty in medicine and nuclear technology is in it."

Dr. San Luis clarified that nuclear medicine is not at all about caring about those who had been involved in nuclear accidents, as those are very rare. Instead, nuclear medicine is used in diagnostics and also in the treatment of certain cancers such as thyroid cancer, lymphoma, and neuroblastoma which develops from immature nerve cells, among others.

Looking beyond, seeing in between

The youngest among the speakers, Anton Philippe T. Tanquitic, who recently bagged second place in the Nuclear Olympiad challenged the students to always "look beyond."

"We know so much now, because we are standing on the shoulders of giants," he said. "Last generation's 'beyond' is today's generation's current state."

Expert calls for diversification of fuel options

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

THE PHILIPPINES should reduce its dependency on one fuel, and instead tap diverse fuels in order to provide for its increasing electricity requirements.

This need for a strong program on diversification for the energy sector was raised by Energy Policy and Planning Bureau Director Jesus T. Tamang in his talk about the Philippine Energy Plan at the 3rd Philippine Nuclear Congress organized by the Department of Science and Technology (DOST) and its attached agency, the Philippine Nuclear Research Institute (PNRI).

Held at the Diamond Hotel in Manila from December 7-9, 2015, the 3rd Philippine Nuclear Congress discussed the status and contributions of nuclear science and technology in national development and helped establish stronger linkages between the different sectors and institutions.

According to Tamang, nuclear energy is still part of the long-term options for the Philippines. But the country should have a national policy for nuclear energy as a power generator if it will indeed be tapped, he stressed.

In the 1970s, the Philippines depended heavily on oil. This was replaced by other fuels in succeeding years. Presently however, the country is once again banking heavily on one single source for fuel supply – coal.

The years 1990-2014 saw a tripling of electricity requirements in the country brought about by different factors namely, the residential sector, the urbanizing sector, and growing purchasing power.

However, it is the households, Tamang said, which are the leading drivers of this significant increase in electricity requirements.

"Right now, we remain to be at 80% connection for the households. We would like to be able to replace this to 90 % by 2017 and hopefully by 2020, we will be able to achieve 100%," he revealed. "But then we need to take note that the number of households remain a moving target."

Aside from the households, he mentioned business outsourcing companies which are very much dependent on electricity and manufacturing firms planning to put up their plants in the country, as additional drivers of increased energy requirements. This scenario, he said, will spawn a lot of automations and connections, thus fuelling the need for a more sustainable energy supply.

The prospect of industrialization for the agricultural sector is another factor. "If we move toward that objective, definitely energy is still going to be required," Tamang explained. "Even electricity will be required in the farms, the cannery, and all these related facilities."

To select which fuels will be part of this fuel mix policy, Tamang said that what is important is the equivalent price to the end user. He explained, "We can check for how much is the generation cost of power from coal. But at the moment, we're still not able to account for the cost of externalities – how much of the emissions, of the particulates from coal is affecting us, especially the community where the power plant is, and how much of that can be added to the generation cost. So right now, on the fuel mix policy that we're working on, we're trying to account for the possible externalities. We'd like to be able to identify externalities for all fuels – good or bad. Because one externality may be also generating jobs, or creation of new industries."

In case of nuclear energy, he said that first of all, they need to complete the feasibility study that they are working on, put in place a nuclear energy program implementation office, recommend an action to be taken on the Bataan Nuclear Power Plant, and have a stronger nuclear information campaign if indeed it will be tapped.

Tamang also mentioned the necessity of a strong energy infrastructure that can withstand natural calamities especially in the face of climate change. "We want to make sure that all our facilities – be the power plant, the substation, the petroleum dispensing station – all of these should be always able to withstand the very force of climate change and if they are affected, they should be able to bring back service at the soonest possible time," he said. For this, he added that government and the private sector should work hand in hand.

The Ateneo de Manila graduate however reminded his audience to remember the 'in between.'

"In trying to look beyond, don't forget to pay attention to the present, to the 'in between'. For the 'in between' is where opportunities may arise, he explained.

This was how he saw his life when he got the chance to join the Nuclear Olympiad, a contest which required participants to produce a video on the topic of nuclear techniques for global development.

Then an intern at PNRI, Tanquitic related that he only learned about the contest a few weeks before the deadline but still managed to get into the finals where he had to submit an essay and do an oral presentation about his topic. Joining the event led him to other opportunities, such as the chance to explore Europe when he visited the IAEA headquarters in Vienna, Austria and CERN in Geneva, Switzerland all in one year. CERN stands for Conseil Européen pour la Recherche Nucléaire or the European Council for Nuclear Research.

Held from Dec. 7-9, the Philippine Nuclear Congress serves as a valuable forum for discussing nuclear science and technology applications for technological development and inclusive growth. Other activities included technical sessions on the applications of nuclear science in food, industry, environment and nuclear safety; and the Philippine Nuclear National Quiz finals.

DOST unveils machines for food processing, longer shelf life of brown rice

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

Microwave Vacuum Dryer. The compact design of the Microwave Vacuum Dryer makes it an ideal food processing equipment for start-up entrepreneurs engaged in food processing. The MVD uses the microwave and vacuum technology as drying method that reduces moisture content of agricultural products like rice bran, chili and garlic to inhibit growth of bacteria and microorganisms. Using the MVD enables food processors to decrease drying time, and allows for easy cleaning at low maintenance cost. *(Text by Rodolfo P. de Guzman/Photo by Gerardo de Jesus/S&T Media Service, DOST-STII)*

ON THE occasion of the Department of Science and Technology's (DOST) Science Nation Tour in the National Capital Region, one of its agencies, the Metals Industry Research and Development Center (MIRDC) launched two innovative food processing machines to raise the level of competitiveness of Philippine food products.

The launching was held last December 9, 2015 at the Platinum Building Conference Hall, DOST Complex, Taguig City.

With sufficient funding and technical support from the DOST system, the MIRDC was able to fabricate the Microwave Vacuum Dryer (MVD) and the Superheated Steam Treatment System (SSTS) for stabilizing brown rice.

In his opening message, Assistant Secretary Robert O. Dizon, MIRDC officer-in-charge, said, "This is definitely an innovation, the first localized microwave vacuum dryer that is cheaper than imported ones, roughly costing only P1.8 million compared to foreign brand from China priced at P2.3 million and so this is a good lead for us to be a competitive player in the food industry."

The MVD was developed under the Support Program for Productivity and Competitiveness of the Metals and Engineering Industries of the DOST. The technology combines microwave heating and vacuum environment where heat is transferred directly to the material with the waves stimulating the molecules in food products, resulting in decreased moisture content and a drying effect. The use of microwave vacuum technology has several advantages over traditional ways of processing and/or drying food products namely, it reduces drying time, lowers drying temperature, registers lower energy consumption, and comes up with high quality products.

MVD can be used to process rice bran or *darak,* an otherwise useless by-product of rice mills, making it a valuable supplement in various processed food products like sausages or hotdogs. Likewise, the MVD can also be used in other applications like chili and garlic, two important ingredients in the food industry.

Once applied in processed foods, the stabilized rice bran enhances the nutritional value of foods with B vitamins, minerals and nutrients and omega 3-6-9 fatty acids. "By using the microwave vacuum drying machine, we are able to maintain the nutritional content of processed foods and one example is the sausages we developed

TO PAGE 80

PNoy signs PAGASA modernization bill into law

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

THE COUNTRY'S weather bureau gets revitalized as President Benigno S. Aquino III signed into law Republic Act 10692 or An Act Providing for the Modernization of the Philippine Atmospheric, Geophysical, and Astronomical Services Administration (PAGASA), Providing Funds Therefore and for Other Purposes, last November 3, 2015.

The law compels the weather bureau, an agency under the Department of Science and Technology (DOST), to modernize its technological operational capacity and strengthen its role as the premier national weather agency in order to attain its vision as a center of excellence for weather-related information services.

The modernization will cover PAGASA's modernization of its physical resources and operational techniques, which shall entail the acquisition and/or upgrading of state-of-the-art instruments, equipment, facilities and systems, with emphasis on weather and flood monitoring and warning system and agro-meteorological observation system to strengthen services for agriculture and food security.

It will also enhance its research and development capabilities and establish regional weather service centers as well as the DOST-PAGASA data center, which shall include the centralization of the different technical outputs including data and statistics derived from the PAGASA operations and systems.

A regional and international cooperation program will also boost the agency's collaboration with relevant international bodies and government institutions to complement its modernization efforts.

Aside from these, it will enhance weather data collection and information dissemination, which aims to develop and use effective weather information method using local dialects, non-technical terms and familiar graphical presentations to ensure a laymanized delivery of hydrometeorological information for greater public awareness and to draw appropriate response for disaster risk reduction.

http://www.panahon.tv/blog/2014/08/pagasa-exposed/

Also included is the creation of a human resource development program and development of a new salary scale and additional incentives for its personnel. Likewise, it will enable scholarship programs for undergraduate and graduate studies to sustain the needed number of experts in meteorology and other related fields.

Modernization funds

Initially, the amount of P3 billion, which shall be taken from the National Government's share in the gross income of the Philippine Amusement and Gaming Corporation, will jumpstart the modernization plan. Two years after the effectivity of RA 10692, at least P1.5 billion will be released to PAGASA every year. The entire P3 billion shall be used exclusively for capital outlay.

The law will allow PAGASA to avail loans, grants, bequests, and donations from local or foreign financial institutions for further enhancement of its operations. PAGASA shall also be given the right to monetize its specialized products and services and cost recovery program to earn revenues from its issuance of specialized weather products and services, especially those related to aviation and maritime industry, weather certifications, and scientific and technical publications.

According to DOST Secretary Mario G. Montejo, the enactment of the modernization law is a necessary development as weather conditions are becoming more severe as the years advance.

"We at DOST commend our legislators and the President for setting this vital legislation into motion." Montejo said. "This only proves that the government is looking after the welfare of its people. And with the modernization of PAGASA and Project NOAH's platform for disaster risk early warning, and the full cooperation of the public, we guarantee that in the coming years, our nation will no longer grieve for the loss of lives during calamities."

The Modernization Act shall take effect 15 days after its publication in at least two newspapers of general circulation.

The prestigious 13th Quezon City Manuel L. Quezon Gawad Parangal award for public service was conferred to Department of Science and Technology (DOST) Secretary Mario G. Montejo (4th from right) by Quezon City Mayor Herbert Bautista (3rd from right) for his outstanding achievements in promoting a culture of science and technology through various development programs. (*S&T Media Service)*

Montejo is Quezon Gawad awardee for public service

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

SECRETARY MARIO G. Montejo of the Department of Science and Technology (DOST) was awarded the Quezon Gawad Parangal for public service category. The award-giving body recognized Secretary Montejo's various accomplishments in the promotion of science and technology with programs on healthcare, education, industry, enterprise development, information technology and disaster risk reduction and management, among others.

The Quezon City Manuel L. Quezon Gawad Parangal, now on its 13th year, conferred the recognition to 11 individuals, including Sec. Montejo, and five institutions in various fields for outstanding achievements that inspire and exert a positive impact on society as exemplified by President Manuel L. Quezon when he envisioned and created the city.

For the last five years since assuming his post in 2010, Montejo consistently pursued development programs in science and technology to support local scientists, engineers, students, and entrepreneurs in achieving inclusive growth and eventually contribute to the country's national development.

In one of the press interviews, Montejo said, "The country is full of talented and highly capable scientists with many innovative ideas that resulted in creating new products and processes instrumental in improving the lives of Mang Juan and Aling Maria. The bottom line here is that the DOST created a

conducive environment for our scientists to be creative, inventive and innovative and to come up with products as practical solutions to everyday problems."

Under the stewardship of Montejo, the government's scholarship grants under the Science Education Institute (SEI) have continuously increased for the last five years. Scholarship grants rose from 1,250 in 2010 to 5,595 in 2015. By 2014 there were already 12,117 scholars (3,973 new scholars, 6,888 continuing and 1,256 scholar-graduates).

Consequently, the Philippine Science High School system adopts the One Campus per Administrative Region under R.A. 9036 targeting 16 campuses by 2016. Currently, there are 14 Pisay campuses all over the country with Romblon and Zamboanga in the pipeline. "The DOST invests on our young people who wants to pursue careers in science and technology that is why we have increased our scholarship allotment to enable more poor but deserving students in the countryside to have the equal opportunity for quality education. Enrolment in Pisay increased from 3,532 in 2010-2011 to 4,587 in 2014-2015," Montejo said.

Making DOST more relevant and responsive to pressing problems like climate change, Montejo, together with renowned disaster scientists and engineers Dr. Mahar A. Lagmay and Dr. Enrico C. Paringit, both from the University of the Philippines Diliman, and DOST Asst. Secretary Raymund E. Liboro, created the Nationwide Operational Assessment of Hazards or Project NOAH and the UP-Disaster Risk and Exposure Assessment for Mitigation.

Under these programs, the DOST was able to provide an early flood warning system with a six-hour lead time by using light detection and ranging technology for hazard mapping and sophisticated software for flood modeling. These programs have already completed mapping the 18 major river systems in the country and is on its next phase, mapping the 257 minor river systems.

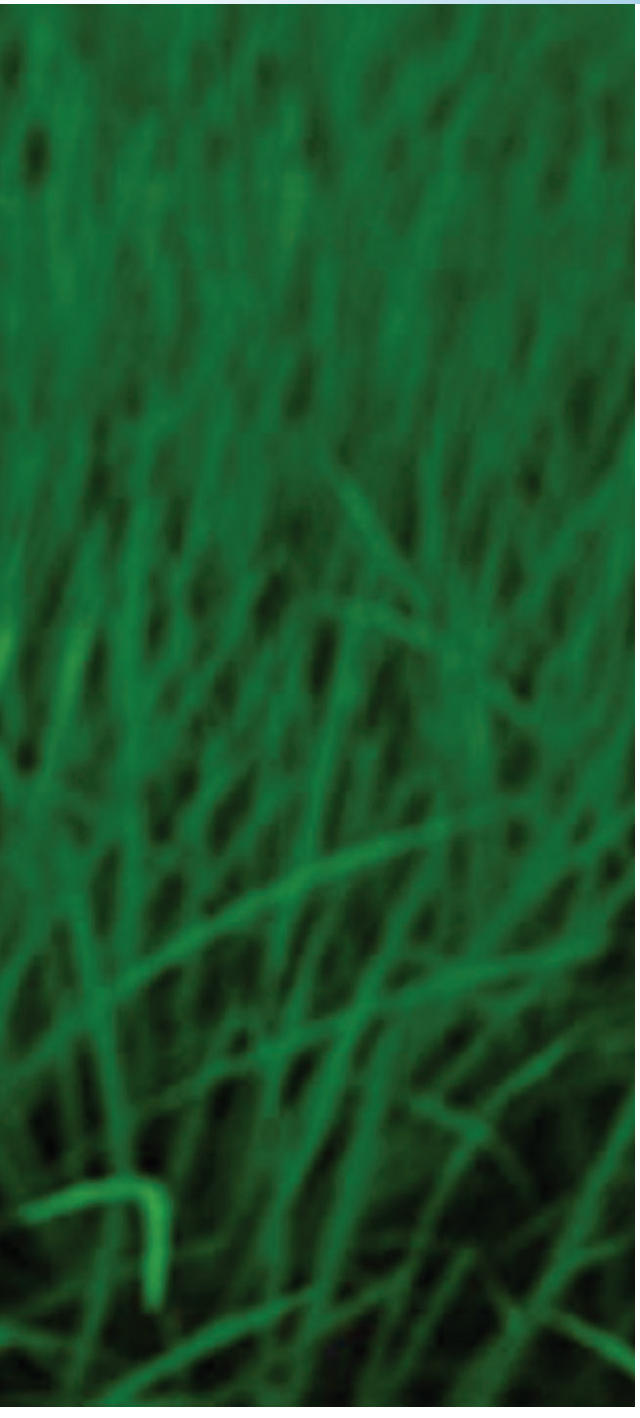
As a result of this innovative approaches using science and technology, the DOST has generated multi-hazard maps that include flood, landslide and storm surge that were instrumental in mitigating disasters during Typhoon Ruby last December 2014.

Other programs attributed to Secretary Montejo's leadership are the Hybrid Electric Road Train and Automated Guideway Transit, both alternative mass transport systems; the Die and Mold Development Center for metal fabrication; the Electronic Product Development Center to cater to the electronics industry; the Advanced Materials Analysis and Testing Laboratory servicing the semiconductor industry; PTRI Innovation Center for Yarns and Textile; Food Innovation Centers as food processing hubs in the regions; Small Enterprise Technology Upgrading Program; Tuklas Lunas Centers for research in herbal medicines; and OL Trap for dengue prevention.

Notable awardees who were likewise recognized last October 19 at the SMART Araneta Coliseum were Raul C. Pangalangan (legal), Ameurfina Melencio-Herrera (justice) Kara Patria David (journalism), Brillante Mendoza (film), Leonor Briones (economics and finance), and Jaime Miguel G. Belmonte (business), among others. For the organization category, Project NOAH was recognized with Dr. Lagmay accepting the award.

DOST Secretary Mario G. Montejo (fifth from right) together with Dr. Alfredo Mahar Francisco A. Lagmay (6th from right), Executive Director of Project NOAH, the DOST's flagship program for disaster preparedness and risk reduction that provides a digital platform for disaster information like flood, landslide and storm surge hazard maps. Also in photo are Quezon City Mayor Herbert Bautista (2nd from right) and DOST Assistant Secretary Raymund E. Liboro (4th from right). *(S&T Media Service)*

HAPPENING NOW:
Modern Biotechnology



GOLDEN RICE: (Source: IRRI)

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

By the year 2020, world population is anticipated to hit eight billion; the Philippines' population itself is expected to balloon to 126 million.

With this projected boom in population, can you imagine how people would be able to sustain their needs without scarcity? Would there be sufficient food supply for all of us? Would there be adequate clean water to drink? And would our environment be safe enough to live in?

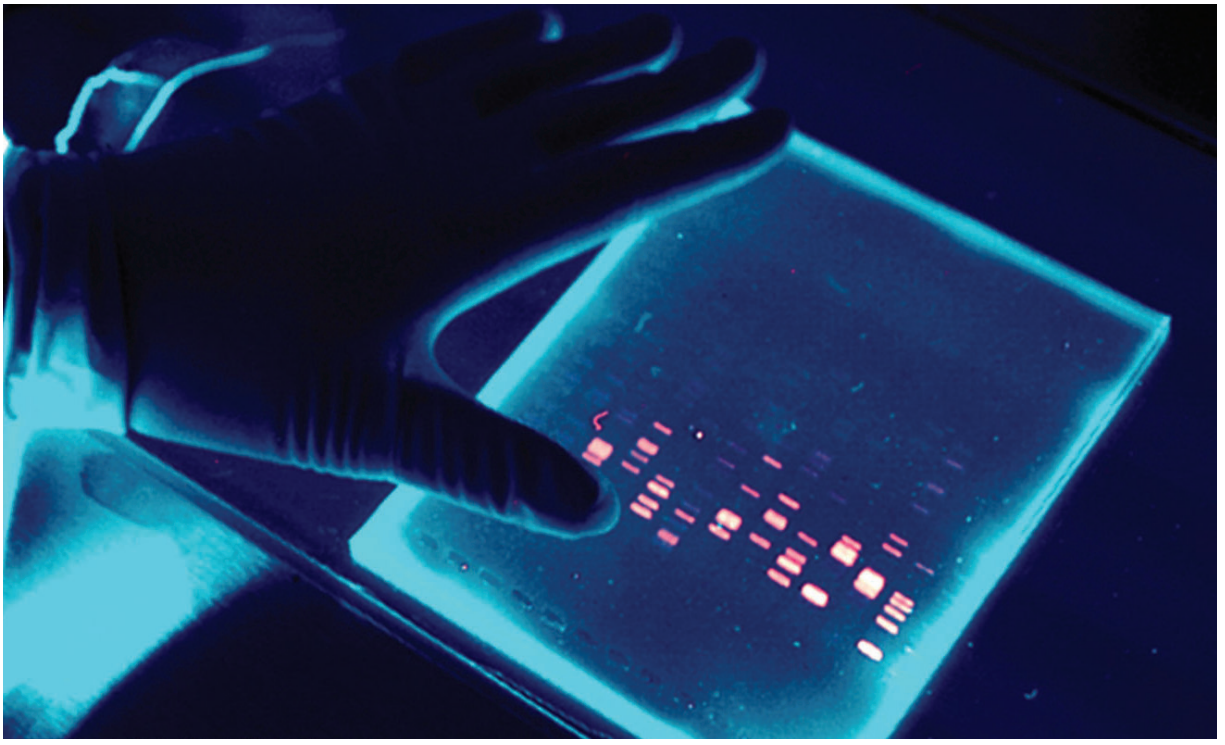
What is Biotechnology?

Biotechnology is one technology-based strategy to address the challenges of meeting the needs of a burgeoning population amidst limited resources. Biotechnology utilizes living organisms, cells, or their cellular components or their parts to produce useful products and commodities and develop new technologies as well.

It can be of great help for the improvement of crops for food and fiber. Moreover, it can deliver highly effective medicines and medical treatments. It can also yield industrial products that are environmental-friendly.

Traditional or classical biotechnology makes use of methods such as fermentation like in brewing beer. Food products like cheese, wine, bagoong and nata de coco are produced using the traditional methods of biotechnology.

Dianara D. Angeles



Modern biotechnology has used tissue and cell culture. More advanced techniques of modern biotechnology use DNA fingerprinting and molecular markers techniques to do genetic engineering.

DNA, the short term for deoxyribonucleic acid, is the master molecule that provides the code or instructions to define the traits of living organisms. Because of DNA, traits can be passed on from parents to progenies, whether in humans, other animals, plants and microorganisms.

Also known as recombinant DNA technology, genetic engineering involves the transfer of genes or gene fragments from one organism to another to produce novel traits in the recipient living organism.

Some genetically engineered (GE) products that are now commercially available are the so-called Bt crops like Bt corn, Bt cotton, and Bt potato. These products contain a gene fragment from the soil bacterium Bacillus thuringiensis that confer these plants with resistance to some insects. There are also plants genetically engineered to tolerate herbicides. Another example is canola oil that comes from crops with modified oil content.

Today, biotechnology is a cutting-edge technology being developed and used in four major industrial areas. These applications include health care (medical), crop production and agriculture, industrial uses of crops and other products, and environmental uses.

1. Health

a. Genetic Engineering has been used to produce pharmaceuticals and life-saving drugs such as insulin and vaccines.

In addition, some medically useful proteins have been developed like interferon, and synthetic vaccines against malaria, rabies and hepatitis B.

b. Biotechnology approaches have been used in a variety of medical applications like screening and diagnoses of genetically-linked diseases like cancer and Parkinson's disease. Gene therapy is a medical approach wherein treatment involves modification of the genetic makeup of the patient.

c. Biofortication is another useful application. Functional foods are those with health benefits aside from basic nutrition. These include fruits, vegetables, whole grains, soy, milk, enhanced foods and beverages, and some dietary supplements.

Through biotechnology, crops are now being enhanced to increase their levels of important biologically active substances for the improvement of nutrition, such as:

- Higher levels of phytosterols for reduced cholesterol
- Higher levels of carotenoids for increased Vitamin A content
- Higher levels of antioxidants
- Higher levels of essential fatty acids
- Low-linolenic acid soybean
- High-lysinecorn

Food safety assessment ensures that a particular food will not

cause harm when prepared or consumed according to its intended use.

d. Bio-pharming is a process wherein plants are used as "factories" of useful compounds for health, medicine, and nutrition.

For example, enhanced production in garlic of allicin that is found to lower cholesterol level, and in strawberry, ellagic acid that helps fight cancer can be achieved through bio-pharming.

2. Environment

a. Biotechnology helps in the conservation of species.

One major reason for the alarming endangerments of species is the degradation or destruction of their ecosystem. With biotechnology, methods have been developed for the conservation of the species.

DNA Banks

The use of DNA banks has been described as an efficient, simple, and long-term method in protecting genetic resources for biodiversity conservation. DNA banks lessen the risk of exposing genetic information in natural surroundings. DNA banks also require a small size of sample for storage and keep the nature of DNA stable in cold storage.

DNA and Protein Profiling

The analysis of DNA and protein composition is conducted through electrophoresis to evaluate the crop's genetic relatedness and distances from other relatives—essential for coming up with effective conservation management programs for endangered species.

Molecular Markers

Molecular markers are also used to map out the genetic base of crops and select favorable traits to come up with a better germplasm for growers.

b. Genetic engineering offers opportunities for the protection of the environment. For instance, microorganisms have been genetically modified to make them more efficient in degrading oil.

c. The use of natural pesticides, such as those in genetically modified Bt crops helps reduce pesticide use and thus contributes in protecting the environment.

d. What's more, recent studies in the US revealed that Bt products have little or no effect on birds, fish, aquatic invertebrates, and other insects. This helps maintain biodiversity for present and future generations.

e. Bioremediation can be used to solve an environmental problem such as contaminated soil or groundwater thru use of biological organisms.

Different types of microorganisms and plants like fungi, seaweeds and other higher plants are used to clean the environment of contaminants.

In a laboratory study, the team of Dr Matthew Lee and his colleagues in the University of New South Wales showed that chloroform was broken down eight times faster when a culture of Dehalobacter bacteria was added to reactive iron compared to using iron alone.

f. Biotechnology is also used to produce biofuel like bioethanol from sugarcane which lead to reduction of greenhouse gas emissions that contribute to global warming and climate change.

Biotechnology is one environment-friendly technology that helps keep the environment clean and green.

3. Agriculture

a. In the Philippines, according to Department of Agriculture, the use of Bt corn resulted in significant improvement in yield and grain quality, aside from the reduced need for insecticide applications. A wide range of biotech products has shown that biotechnology has been highly profitable for farmers.

b. Through genetic engineering, desired traits in crops such as pest and disease resistance, better nutritional quality and stress tolerance can be incorporated in crop varieties.

There are now products such as tomatoes that ripen slowly,

to page 23

DNA Fingerprinting
http://dna-fingerprinting.weebly.com/bibliography.html

Montejo bets on biotechnology for food security, better healthcare

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

www-greenpeace-org.jpg

With agricultural productivity, food security, and public health at the top of its agenda, the Department of Science and Technology (DOST) under the leadership of Secretary Mario G. Montejo, spearheads the National Biotechnology Week (NBW) 2015 held from November 23-28, 2015 at SM City Dasmariñas in Cavite.

Celebrated annually, NBW showcases the latest inventions and innovations in the field of biotechnology as a response to meet the challenges of climate change that have great impact on farm harvests, crop yields and climate-related diseases. It bears the theme "*Kaagapay ng Mamamayan sa Pambansang Kaunlaran.*"

"We answer the problem posed by climate change to agricultural productivity, food security and health care by harnessing the power of biotechnology, of using safe but highly effective scientific processes in improving crop varieties resistant to extreme weather conditions and developing breakthrough drugs in combating recurring and emerging diseases," said Secretary Montejo in his speech read by Dr. Reynaldo V. Ebora, executive director of DOST's Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development during NBW's opening ceremony.

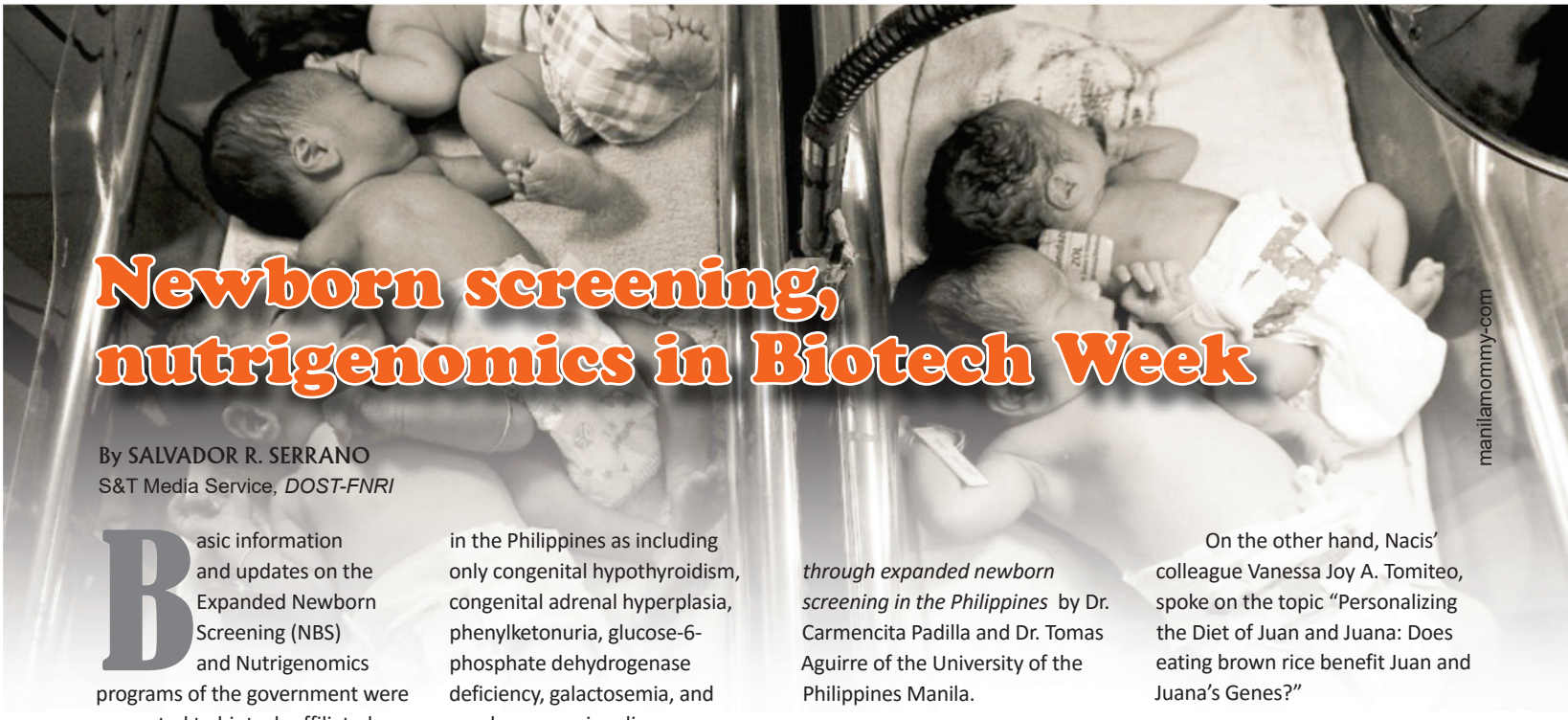
The week-long celebration featured, among others, new inventions and innovations developed by local scientists and researchers in different fields of agriculture and aquaculture, in creating environment friendly fertilizers, improving crop varieties, discovering pest-resistant seeds, formulating indigenous drugs and medicines. All these are being initiated through the use of biotechnology as a science for creating better crops, better products and better processes.

"At the current pace of global biotech R&D, our potential to improve medicine, agriculture and industry will be greatly enhanced," Montejo added. "For example, by consulting personalized medical profiles, doctors will be able to identify genetic risks for chronic illnesses and tailor their medical advice to individual patients."

Montejo also stressed the necessity to continuously open channels of communication about new issues and their implications. "We all need to pay more than lip service to engaging the public in discussions about the science of biotechnology. Surely fostering such engagement is a mutual concern. We can certainly learn from each other's experiences in this realm," he said.

NBW included exhibits, forums on biotechnology use in agriculture, aquaculture, environment, health, nutrition and other applications. There were also career talks to entice high school and elementary student to take up courses related to biotechnology.

NBW is co-organized by DOST with the DOH, DA, DENR, DILG, DTI, DepEd, CHED, and the Biotechnology Coalition of the Philippines.



manilamommy-com

Newborn screening, nutrigenomics in Biotech Week

By SALVADOR R. SERRANO
S&T Media Service, *DOST-FNRI*

Basic information and updates on the Expanded Newborn Screening (NBS) and Nutrigenomics programs of the government were presented to biotech-affiliated professionals and students at the Health Forum of the 2015 National Biotechnology Week (NBW) last November 23, 2015.

Led by the Department of Science and Technology's Philippine Council for Health Research and Development (DOST-PCHRD) and the Food and Nutrition Research Institute (DOST-FNRI), the forum shed light on the progress of implementing the Expanded NBS Program, the trial for which is being conducted in selected hospitals in Metro Manila.

Newborn screening is a procedure for the early identification of infants affected by certain genetic, metabolic, or infectious conditions that may lead to mental retardation or morbidity if left untreated, thus saving more lives and reducing unnecessary negative health outcomes in Filipino newborns.

Speaking at the said forum, Dr. Maria Melanie Liberty Alcausin, Newborn Screening Reference Center Director, referred to the current coverage of newborn screening in the Philippines as including only congenital hypothyroidism, congenital adrenal hyperplasia, phenylketonuria, glucose-6-phosphate dehydrogenase deficiency, galactosemia, and maple syrup urine disease.

However, Dr. Alcausin reported that the expanded screening includes 22 more disorders like hemoglobinopathies and additional metabolic disorders, namely, organic acid, fatty acid oxidation, and amino acid disorders.

The latter are included in the standard care globally, while the expanded NBS will be optional to parents in all participating facilities, the DOH declared.

The DOH added that the first option is the screening of six disorders at ₱550, which is included in the newborn care package for Philhealth members, while the second option is the full complement of disorders at ₱1,500.

At present, the DOH is negotiating with Philhealth to increase subsidy for the Expanded NBS.

The expansion of the coverage of the NBS program was prompted by the results of the study on *Enhancing case detection of selected inherited disorders through expanded newborn screening in the Philippines* by Dr. Carmencita Padilla and Dr. Tomas Aguirre of the University of the Philippines Manila.

The data on Filipino newborns screened through the California newborn screening program from 2005 to 2009 revealed that serious disorders were detected which are not included in the Philippines' existing program.

Meanwhile, Jacus S. Nacis, science research specialist I of FNRI's Nutrigenomics Unit, introduced the audience to the concept of nutrigenomics, the area of nutrition that uses molecular tools to search, access and understand the several responses obtained through a certain diet applied between individuals or population groups.

According to Nacis, individuals or groups of people with genetic predisposition to nutrition-related or lifestyle-related non-communicable diseases like hypertension, diabetes, heart diseases, overweight and obesity and cancer, among others, now have a fighting chance to leave healthy, normal lives instead of surrendering one's future to heredity.

On the other hand, Nacis' colleague Vanessa Joy A. Tomiteo, spoke on the topic "Personalizing the Diet of Juan and Juana: Does eating brown rice benefit Juan and Juana's Genes?"

Timoteo stated that eating brown rice regularly can lower blood glucose levels, weight, body mass index, and blood pressure of Filipinos carrying the normal or wild-type allele. An allele is an alternative form of the same gene. The dietary fiber, B-vitamins and minerals in brown rice help prevent many diseases whether caused by our genes, unhealthy diet, or lack of physical activity.

For more information on the DOST-FNRI's Nutrigenomics program or any food and nutrition concern, contact Dr. Mario V. Capanzana, FNRI Director, at the FNRI Building, DOST Compound, General Santos Avenue, Bicutan, Taguig City, or at 837-2934, mvc@fnri.dost.gov.ph, mar_v_c@yahoo.com, and visit the FNRI website at http://www.fnri.dost.gov.ph

Salvador R. Serrano

Workshop immerses studes in biotechnology

By FATIMA M. MONCADA
S&T Media Service, *DOST-STII*

Students carefully perform extraction of banana DNA using household chemicals

Learning about biotechnology can be fun and exciting. This was demonstrated in the seminar entitled "Understanding Biotechnology Seminar-Workshop for High School and Elementary Students."

The seminar featured activities that engaged the students from Maquiling School Incorporated, Christian School International, University of the Philippines Rural High School, De La Salle Lipa, Cavite State University, and B. N. Calara Elementary and High School.

In one of the group activities led by Prof. Carlo Miguel Sandoval of University of the Philippines-Institute of Plant Breeding (UPLB-IPB), the students were able to extract DNA of a banana using common household chemicals such as alcohol, dishwashing liquid, and salt. Another activity enjoyed by the participants was creating paper models of the human DNA, which carries all the information about how a living thing will look and function.

Prof. Sandoval said that making biotechnology comprehensible to young Filipinos is "very important because we are in a period where biotech is already booming and we have a lot of technology that we don't know are biotech. It is important to communicate [biotech] effectively, educate, and inform [Filipinos] even at a very young age so they can understand [biotech] especially nowadays that there are a lot of issues against products of modern biotechnology and most of them are rooted on miscommunication or misunderstanding."

Prof. Sandoval added that he sees a biotech-driven Philippines in the future especially with the very strong support of the government. "They are providing funds for us not only for research but also for activities such as biotech information, education, and communication," he stated.

There were also discussions on Principles and Applications of Biotechnology facilitated by Dr. Orlex Yllano of the Adventist University of the Philippines and Food and Environmental Safety of GMOs led by Dr. Roberta N. Garcia of UPLB-IPB.

Dr. Yllano emphasized in his lecture that he made his presentation very basic and simple to cater to the comprehension level of the elementary students present in the event.

Aside from helping students understand biotechnology, Dr. Yllano hopes that the seminar-workshop would encourage students to choose biotechnology as their career path. "Biotechnology is a relatively new area that needs promoting so that students would appreciate it and have careers related to it."

As for the future of biotechnology in the Philippines, Dr. Yllano is positive that it will thrive. According to him, the number of UP students taking up biotechnology is increasing.

The seminar-workshop was organized by the National Academy of Science and Technology (NAST) of DOST, Southeast Asian Regional Center for Graduate Study and Research in Agriculture-Biotechnology Information Center, and the UPLB-IPB. It was created based on the book written by NAST Academician Dr. Evelyn Mae Mendoza titled "Understanding Biotechnology."

Young Filipino scientists, essential to country's food security- agriculturists

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

The Philippines might face a possible food shortage if the government will not invest in biotechnology, according to experts.

Modern biotechnology must take effect as a method of breeding crops to be able to satisfy the needs of Mang Juan and Aling Maria in the midst of an ever increasing population.

The call to tap biotechnology however does not only involve the current crop of science and technology experts. It also involves the youth who will someday continue the mission of today's scientists.

In a discussion dubbed "S&T Forum on Agri-Biotech," scientists and agriculturists from the Department of Science and Technology-Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (DOST-PCAARRD), University of the Philippines- Los Baños (UPLB) and UPLB- National Institute of Molecular Biology and Biotechnology (UPLB-BIOTECH) discussed the programs, processes, and researches associated with biotechnology and genomics, with mostly agriculture and biology students in the audience.

"We need the young ones, our future scientists and/ or agriculturists, to continue our works for the agriculture sector, so that more foods will be served on our tables in the next years," Dr. Rita P. Laude of UPLB said in her presentation on "Genomics Overview and Its Application in Crops."

Genomics involves the sequencing and analysis of the genome of plants, animals and microorganism, and studies the role that they play in biology. Genomics is used in agriculture to cultivate large quantities of more nutrient-rich, more resistant, and safe food crops, livestock and aquatic organisms.

The other speakers in the forum were Dr. Hayde F. Galvez who discussed the "Coconut Genomics Program"of the Philippine Genome Center Development Program for Agriculture and Dr. Mannix S. Pedro of UPLB-BIOTECH who presented his group's project on the development of a plant biostimulant which is funded by PCAARRD.

A biostimulant is any substance based on natural resources made into a specific form and applied to plants, seeds, soil and others to stimulate the natural processes of the plants and make them benefit from nutrient efficiency.

Meanwhile, Dr. Synan S. Baguio of PCAARRD talked about the "Use of DNA Markers in Swine Breeding and Selection," giving emphasis to swine as a major food source in the Philippines which is the 8th biggest pork producer in the world. The country is continuously improving its swine industry by hinging on genomics in breeding.

"Biotechnology has a very vast application in agriculture. Time will come that we will no longer be around," Dr. Baguio told the students. "It will be up to you now to continue what we have started in the field of biotechnology for everyone's future."

strings-of-young-ideas-img

Top biotech stories cited anew

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

For the 9th consecutive year, via the 2015 Jose G. Burgos, Jr Awards for Biotech Journalism, published news and feature stories on the numerous benefits of biotechnology to the common Filipino have been recognized again last November 25, 2015 at Kalipayan Beach Resort in Dasmariñas City, Cavite.

Organized by J. Burgos Media Services, Inc. and Biotechnology for Life Media and Advocacy Resource Center, the Jose G. Burgos Jr. Awards was one of the main highlights of this year's National Biotechnology Week (NBW) hosted by Department of Science and Technology (DOST).

For the news category, the story of Henrylito Tacio entitled "Think of These: Understanding BT Technology" bagged first place, followed by Marvin N. Benaning's article entitled "US environmental scientist claims pesticide use by GMOs on the rise." Finishing at third place is the story of Joel R. San Jose entitled "Group petitions reversal of CA order vs gene-modified eggplant field tests." All three articles were published in Business Mirror.

Meanwhile, for the feature category, "Biotech corn making a farmer the community's VIP" by Clement Dionglay and "Scientific interventions provide healthier rice varieties "by Rowena Galang-Bumanlag received first and second place honors respectively. Both were likewise published in Business Mirror. Rounding up the top three is another story from Tacio entitled "Golden Rice" which was published in Edge Davao.

"We are indeed very happy that this year's awardees not only come from the journalists in the city but from the provinces as well. This only means that relevant and timely issues on biotechnology are now being disseminated and discussed all over the country" said Dr. Edita Burgos, chairman of Jose G. Burgos, Jr. Awards and wife of journalist Jose Burgos after whom the Awards was named.

"I believe that biotechnology is the answer to the impending food crisis, so that I want people to know the real facts about biotechnology and not to rely on hearsay. As a science journalist, I have to stick with the truth," said Tacio.

Tacio also won first prize in the news category in 2013, through his article "Golden Rice: The answer to malnutrition problem,"which was published in Sun Star Davao.

Lyn Resurrecion, desk editor of Business Mirror, said that writing and publishing biotech success stories could be a game in a lot of ways, specifically in helping our farmers to understand technologies and knowledge that would enhance the quality of agricultural products.

The Board of Judges was composed of Ester G. Dipasupil, desk editor of Philippine Daily Inquirer; Maria Monina Cecilia A. Villena, special projects coordinator and network administrator of the Southeast Asian Regional Center for Graduate Study and Research in Agriculture Biotechnology Information Center (SEARCA BIC); and Dr. Vivencio R. Mamaril, columnist of Biolife Magazine.

BIOTECH JOURNALISTS AWARDED. Among the 2015 Jose G. Burgos Jr. Awards for Biotech Journalism awardees were (holding trophies, from left) Rowena Galang-Bumanlag, second prize winner in the feature category, and Joel R. San Jose, third prize winner in the news category. With them in photo are (from left) Joel Paredes, program director of Biotechnology for Life Media and Advocacy Resource Center; Maria Monina Cecilia A. Villena, special projects coordinator and network administrator of the Southeast Asian Regional Center for Graduate Study and Research in Agriculture Biotechnology Information Center (SEARCA BIC); Ester G. Dipasupil, desk editor of Philippine Daily Inquirer; Lyn Resurrecion, desk editor of Business Mirror; and Dr. Edita Burgos, wife of the late journalist Jose G. Burgos, after whom the Awards was named. *(S&T Media Service)*

DOST, partners completing project to stop spread of shrimp disease

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

www-intrafish-com.jpg

A project that aims to detect and prevent the spread of shrimp pathogens, an infectious agent that can cause disease to its host, is now nearing completion.

This was announced by Dr. Cynthia P. Saloma, director of the National Institute of Molecular Biology and Biotechnology in UP–Diliman during the Science and Technology Forum on Aquatic Biotechnology.

The Department of Science and Technology-Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (DOST-PCAARRD), Southeast Asian Fisheries Development Center, Philippine Genome Center, UP and Ateneo de Manila University collaborated to develop the biosensor kit called PhilGeneStrips for the detection of disease in shrimps.

PhilGeneStrips is affordable, easy to use in the field, and has the ability to correctly identify those with the disease as well as those without. It can also detect White Spot Syndrome (WSS) Virus. WSS is a viral infection which is contagious and can quickly lead to death.

The biosensor kit comes with a mobile application that is ready for cloud computing. This application will serve as an online database of pathogen test strip results for the user. It can also monitor stocking cycles, water quality, and other parameters.

According to Dr. Saloma, to develop the detection kit, they used both nanotechnology and the traditional polymerase chain reaction, a scientific technique in molecular biology that is used to investigate and diagnose the growth of diseases.

"With a click of a button, you know where are the sites of active infection as well as the historical record of some of the old sites," said Saloma, referring to the mobile application.

"We have not yet uploaded this online which is still a data version. Next year we hope to have this available to the public," she added.

All over the world, shrimps are very important commodities in the international seafood trade. The Philippines, on the other hand, is gifted with aquaculture potential with numerous coastal areas for the cultivation of shrimps.

Experts advise students: Pursue career in biotech

BY MARIA LUISA S. LUMIOAN & ROMELIE JANELLE MARANAN
S&T Media Service, *DOST-STII*

High school students from Cavite participate in the hands-on activity on DNA fingerprinting during the Career Talks and Interactive Hands-On Activity for High School Students. *(Photos by Henry A. de Leon, S&T Media Serivice,DOST-STII)*

There's a career in biotechnology.

This is the takeaway message in the recently held National Biotechnology Week where a career orientation and career talk were held on November 26.

At the Career Talks and Interactive Hands-On Activity for High School Students, experts said that more science careers are currently up for grabs.

According to plant breeder and molecular biologist Dr. Antonio A. Alfonso who is industry affairs and regulatory head of DuPont Pioneer Philippines, there is dire need in the country for more agribiotechnologists and biotechnology entrepreneurs, especially plant breeders, to address the issue of food security.

Earlier, at the Biotechnology Career Orientation and Experience in Biotechnology Research, held in the morning of the same day, Dr. Leslie Michelle Dalmacio of UP Manila advised her young audience to take advantage of DOST's scholarship programs for undergraduate and graduate studies and use it as their springboard to a career in biotechnology.

"When we make cheese, wine, or *bagoong* (fish paste), we are already applying biotechnology," she told the high school students.

Aside from food and agriculture, biotechnology has several other uses that cut across industries. Dr. Dalmacio mentioned its other broad applications, namely diagnostics, medicine, environment, energy production as well as forensics.

In the Career Talks and Interactive Hands-On Activity which was held in the afternoon, the high school students got a glimpse of what forensic scientists and crime investigators do through a hands-on activity on DNA fingerprinting, often used to determine family relationships and disease-causing organisms, and solve crimes.

Kamela Charmaine Ng, a bioinformatics expert from the Philippine Genome Center, added her own field of specialization into the long list of career options in biotechnology when she spoke to the audience in the morning session.

According to Ng, the field of bioinformatics, which she describes as a marriage of biology and computer

science, is something that even computer scientists can get into.

Bioinformatics uses computers to collect, store, analyze, and integrate biological and genetic data which can be used for drug discovery and development. Bioinformatics has, in fact, become more relevant amidst the growing amount of data generated by Next Generation DNA Sequencing. The term refers to modern DNA sequencing technologies which allow scientists to sequence DNA and RNA a lot faster and in a more cost-effective manner.

Meanwhile, not all science careers require full practice of the profession. Some use the power of communication to disseminate information about biotechnology and science per se.

Dr. Mariechel J. Navarro, director of Global Knowledge Center on Crop Biotechnology of the International Service for the Acquisition of Agri-biotech Applications, is one of the many biotechnology experts turned science communicators. Speaking in the afternoon forum, Navarro stated that science information must be popularized for the public to easily understand it. People with extensive background on science can be science communicators by laymanizing every bit of information.

Among the popular media for science communicators are social networks like Facebook and Twitter, websites, publications, mobile apps, the target audience of which are the youth.

The Career Talks and Interactive Hands-On Activity for High School Students was organized by the DOST-Philippine Science High School System while the Biotechnology Career Orientation and Experience in Biotechnology Research was organized the by DOST-Philippine Council for Industry, Energy, and Emerging Technology Research and Development and the DOST-National Research Council of the Philippines.

HAPPENING NOW...*from page 15*

squash and potatoes with higher levels of nutrients, and even potato fries that absorb less fat during frying.

Rice with high pro-Vitamin A rice (Golden Rice) is being developed to help fight Vitamin A deficiency prevalent in developing countries

c. Genetically engineered crops are being designed to survive in poor conditions. This will ensure a good yield despite field constraints.

d. Genetically modified crops are widely used in many countries such as herbicide-tolerant canola, soybean and tomato; herbicide and insect-resistant corn and cotton; virus-resistant papaya and squash; and insect and virus-resistant potato.

The use of genetically modified crops could greatly impact the economies of developing countries with much needed jobs and increase productivity.

Industry

a. Genetic engineering is a potential tool in the development of new products and processes, improvement of product quality, and use of cleaner and safer production processes.

b. Industrial products such as organic acids, amino acids, biopolymers, pharmaceuticals, and enzymes have also been developed using genetic engineering.

Biotechnology has enhanced the development of chemicals, food and feed, detergents, paper, pulp, textiles as well as provided biofuel.

STAY INFORMED A visitor jots down biotechnology information from the exhibit of Fisheries Biotechnology Center (FBC). Aside from the exhibit, FBC also conducted a symposium on National Fisheries Biotechnology during the event. *(Text by Romelie Janelle Maranan / Photo by Henry A. de Leon, S&T Media Service, DOST-STII)*

DNA SEQUENCING. Philippine Genome Center showcases the process of DNA sequencing through interactive games to exhibit visitors mostly made up of students who actively solved the cases given by the exhibit like real detectives. *(Text by Romelie Janelle Maranan / Photo by Henry A. de Leon, S&T Media Service, DOST-STII)*

GO NATURAL THROUGH BIOTECH Exhibitors from UPLB-National Institute of Molecular Biology and Biotechnology show off various natural products of biotechnology which can be used by the agriculture sector. *(Text by Romelie Janelle Maranan / Photo by Henry A. de Leon, S&T Media Service, DOST-STII)*

START THEM YOUNG UPLB-Institute of Plant Breeding Assistant Professor Carlo Miguel Sandoval answers the queries of a small boy about DNA extraction and assists another during the activity dubbed "Understanding Biotechnology Seminar-Workshop for High School and Elementary Students." *(Text by Romelie Janelle Maranan / Photo by Henry A. de Leon, S&T Media Service, DOST-STII)*

A BITE OF BIOTECHNOLOGY. A mallgoer tastes probiotic cheese for free. The products were developed by UP Los Baños – National Institute of Molecular Biology and Biotechnology with the probiotic starter culture project funded by DOST's Philippine Council for Industry, Energy, and Emerging Technology Research and Development. Probiotic white cheese is made from carabao's milk which has rennet and lactic acid bacteria. Rennet is a coagulant which forms the milk proteins in carabao's milk to turn it into white cheese. Meanwhile, lactic acid bacteria has probiotic properties, which means it can kill the bad bacteria in the stomach. *(Text and photos by Espie Angelica A. de Leon, S&T Media Service, DOST-STII)*

BIOTECHNOLOGY IN A CUP. The Tablea Taste Test was one of the attractions as exhibit visitors got the chance to sample the chocolate drink for free. A product of biotechnology, the Tablea Chocolate was developed by UP Los Baños-National Institute of Molecular Biology and Biotechnology and funded by DOST's Philippine Council for Industry, Energy, and Emerging Technology Research and Development. It eliminates the grittiness and bitter, burnt-like taste of most commercial tablea chocolates and replaces these with a smooth texture and yummier flavour. *(Text by Espie Angelica A. de Leon / Photos by Henry A. de Leon and Espie Angelica A. de Leon, S&T Media Service, DOST-STII)*

CLOSING CEREMONY Students showcase their terpsichorean skill as they perform native dances during the closing ceremony on November 28, 2015. *(Text by Espie Angelica A. de Leon / Photos by Henry A. de Leon, S&T Media Service, DOST-STII)*

nbw

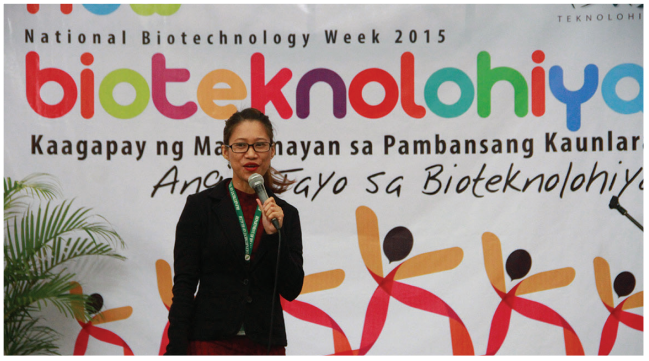
Awed by Biotech

"Marami po kaming natutunan tungkol sa biotechnology, kasi po di po talaga namin siya maintindihan masyado dati. Ang bait pa po ng mga nagsalita kasi pag nagtatanong kami, sinasagot po nila yung mga tanong namin."

- *High school students*
Dasmariñas East National High School

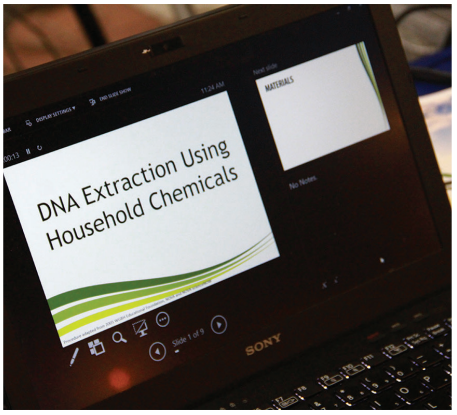
"The government should do more projects like this para di sayang ang budget.... Makakatulong din ito sa mga anak namin, lagi silang nagpapatulong sa assignment nila, di ko masagot (laughs). Sa mga ganito pwede sila makakuha ng sagot, at least credible kaysa sakin (laughs)."

– *Mother*



"Nalaman din po namin yung mga pwede naming maging trabaho sa future. Ngayon pa lang po pwede na kami mamili."

High school student
Dasmariñas East National High School



"Maganda ung exhibits kasi shino-showcase niya yung mga technologies, katulad nung sa somatic embryogenesis ng coconut na talagang helpful ngayon kasi declining ung population ng coconut natin kaya makakatulong ito."

Kemuel C. Punzalan
BS Agriculture student
Cavite State University

"Nag-enjoy din po kami makinig dun sa lecture sa mycorhizza at nalaman po namin kung paano niya napapabilis at nakakatipid ang government sa pagpaparami po ng puno sa atin para maiwasan po iyong pagbabaha, sabi po nung nagsalita po, taga DENR."

Jane Sario
High school student

Photos by Henry A. de Leon & Gerry G. Palad
S&T Media Service, DOST-STII

"Ang gaganda po ng nakalagay sa exhibit tapos magagaling yung mga speakers sa forum na napuntahan namin. Ayun nga po, yung sa forum on agri-biotech, tapos kahapon po yung tungkol sa healthcare forum napakinggan din po namin. Sa Friday po pupunta ulit kami para sa forum on aquatic biotechnology."

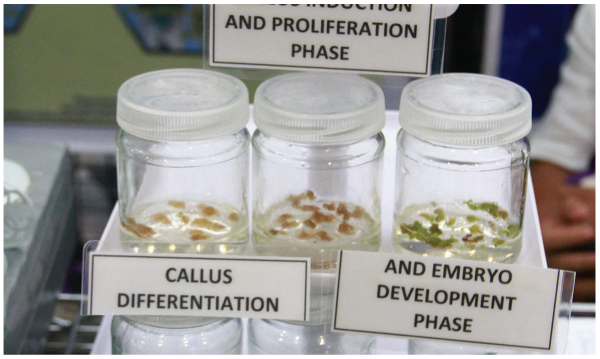
-3rd year students
Bachelor of Science in Biology
Cavite State University

"I am glad po na the government agencies are focusing on popularizing biotechnology for the public. Kakaunti na lang po ang mga kabataan ngayon na nahihilig sa science kaya magandang opportunity po na mahikayat natin sila."

Fatima Gumandayao
Bachelor of Science in Mechanical Engineering
TUP-Cavite

"Mas naunawaan ko iyong sa DNA, anong difference ng GMO sa Biotech. But, sayang lang kasi the venue is too small. We hope na mas malaki sana nasakop na area ng ganitong activities. Despite that, kudos to DOST and other government offices."

-Gelo Espiritu
BPO employee / freelance photographer
29 years old



Parang nakaka-amaze, meron palang ganitong mga existing na bagay. So meron din akong mga bagay na di ko pa din alam dati na alam ko na ngayon.

Christopher C. Araño
Industrial Engineer/Production Engineer

"Pinakanagustuhan po namin yung parang guessing game po sa gilid. Saka po yung sa tablea, kasi po may libre (laughs). Maganda din po yung nakadisplay sa gitna na may nakasulat sa biotechnology. Nag notes po kami kasi baka po magamit namin sa school sa science subject namin."

High School Students

Wowed by its Possibilities

DOST, MMSU put up Food Innovation Center in Ilocos region

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

DIVERSE UNIQUE food products and delectable gastronomic treats greeted guests from this town, as well as government officials and members of the academe, during the formal launching of the Food Innovation Center at the S&T Park of the Mariano Marcos State University (MMSU).

The Food Innovation Center is a joint project of the Department of Science and Technology (DOST) through its Region 1 office headed by Dr. Armando Q. Ganal, MMSU, the National Economic Development Authority (NEDA) and the Development Bank of the Philippines (DBP).

The center, housed in a newly constructed building inside the sprawling 1,300-hectare property of the university, will be a learning hub for research and development in food production and processing of agricultural crops into high-value products that can be marketed locally and abroad.

Inside the facility are locally fabricated machineries and equipment used in food processing like the water retort, a manually operated pressure cooking vessel that processes food packed in sealed containers; and a spray dryer that dries heat-sensitive materials such as food and pharmaceutical products made of slurry paste gel or suspension. Also available are the vacuum fryer donated by DOST, vacuum packaging machine, liquid and solid foam fill machines acquired through MMSU-NEDA-DBP project, and the ceramic water filter.

Ilocano Food Innovation Center. DOST Secretary Mario G. Montejo (second from right) leads local officials of Ilocos Norte in the ribbon cutting ceremony during the launching of the DOST-Mariano Marcos State University (MMSU) Food Innovation Center inside the S&T Park of the MMSU campus in Batac, Ilocos Norte. Assisting Secretary Montejo are (from left) Batac City Mayor Jeffrey Jubal C. Nalupta, Dr. Prima Fe R. Franco, OIC of MMSU and Atty. Windell Chua, provincial administrator of Ilocos Norte representing Governor Imee R. Marcos. The food innovation center will provide research and development services and technical assistance to micro, small and medium enterprises engaged in food processing and other allied ventures to level up product standards, quality and affordability of Filipino innovative food products.

"With the creation of the Food Innovation Center here in Ilocos Norte, we shift opportunities from Manila to the countryside and increase economic development in the regions. The Filipinos are blessed because of their creativity

PRODUCTS OF INNOVATION Batac Mayor Jeffrey Jubal C.Nalupta (right) shows Sec. Montejo the different processed food products like the Corchorus (saluyot leaves powder), Moringa (malunggay leaves powder) and dragon fruit jam using DOST technology and locally fabricated food processing equipment at the Food Innovation Center.

to produce new products through science and technology," said science chief Mario G. Montejo.

Montejo further stressed that the Philippines is moving towards creating a vibrant food processing industry that can rival that of Thailand that produces roughly 4,000 new products every year. So far, he said that the Industrial Technology Development Institute or ITDI, an attached agency of the DOST, has committed to develop around 2,000 new products from a variety of agricultural crops abundant in the regions.

Montejo also mentioned that DOST's drug development program that focuses on locally abundant herbs will also use the center for research purposes. "The DOST's Tuklas Lunas program is one example of how these kinds of machineries and equipment in the FIC are able to produce high quality and affordable drugs and health products using indigenous medicinal plants that are abundant in the countryside," Montejo added.

On the other hand, the host province welcomed the putting up of the Food Innovation Center in Batac as it will spur economic development in the region and create employment opportunities for the Ilocanos, well known for being inherently hardworking, creative and resilient.

"The Center is a milestone in our pursuit of excellence in science and technology that will unlock the doors to prosperity. With this we create more marketable products using our harvest. As we put value added production, we will earn more and it will create a vibrant food industry," said Atty. Windell Chua, Provincial Administrator of Ilocos Norte, reading from the message of Governor Imee Marcos.

According to Dr. Fe R. Franco, Officer-in-Charge of the MMSU, the Center will pave the way for leveling up local S&T food products with those from our Asian neighbors. She also presented to Secretary Montejo the pledge of commitment of MMSU in this endeavor.

"The Center will provide means to achieve food security for Mang Juan and Aling Maria and through this initiative we will be able to encourage business owners to go into the food processing industry since we have the Technology Business Incubator program that will support this," stated Dr. Franco.

The launch of the Center was capped by a tour of the facility, food tasting and sampling, and a mini press conference where guests were able to see up close the different food processing equipment.

Aside from Secretary Montejo, others present were DOST Region 1 Director Dr. Armando Q. Ganal; Jeffrey Jubal C. Nalupta, mayor of Batac City; Herdy I. Yumul of MMSU; and Dr. Marilou P. Lucas, MMSU Director for Research.

Hazard map of the City of Vigan turned over to Sanggunian Panlalawigan Member Edgar I. Yabes.

Portable Ceramic Water Filters turned over to representatives of the City of Vigan, to be used to access supply of potable drinking water from ponds and deep wells especially during disasters. The water filter uses indigenous materials abundant in the area like red clay and nanotechnology developed by DOST and now being replicated by the University of Northern Philippines under the leadership of its president, Dr. Gilbert R. Arce (left).

DOST Scholars Unite. The DOST paid tribute to its young and multi-talented scholars during the DOST Scholar's Night at the Dr. Tadena Hall of the University of Northern Philippines. The event was highlighted with song and dance numbers from the scholars and inspirational messages from DOST officials that included Secretary Montejo, Usec. Rowena Cristina Guevara, Asec. Urduja Tejada, Asec. Raymund E. Liboro, and DOST Regional Director Armando P. Ganal.

Science Nation Tour

Cordillera Administrative Region
October 7-8, 2015

DOST, PCCI, ink partnership for more competitive MSMEs sector in CAR

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

Department of Science and Technology (DOST) Secretary Mario G. Montejo (middle), DOST-Cordillera Administrative Region (CAR) Director Julius Caesar B. Sicat (left), and Philippine Chamber of Commerce and Industry (PCCI) Regional Governor Marciano L. Garcia sign a Memorandum of Understanding (MOU) last October 7, 2015, at Camp John Hay in Baguio City. The goal of said MOU is to improve the quality of production of the MSMEs sector in CAR. *(Photo by Arjay Escondo, S &T Media Service)*

BOTH OFFICES of Department of Science and Technology (DOST) and Philippine Chamber of Commerce and Industry (PCCI) in Cordillera Administrative Region (CAR) signed a Memorandum of Understanding (MOU) last October 7, 2015 at Camp John Hay in Baguio City, aiming to strengthen the capability of local micro, small and medium enterprises (MSMEs) sector in the region.

Under the said MOU, DOST-CAR and PCCI-CAR will sustain and expand its partnerships to help the MSMEs have access to different technological innovations in order to improve their production efficiency and competitiveness, as well as mentoring services to make them world-class business enterprises.

Among the signatories of the MOU were: DOST Secretary Mario G. Montejo, DOST-CAR Regional Director Julius Caesar B. Sicat, PCCI-CAR Regional Governor Marciano L. Garcia, President of PCCI Baguio-Benguet Chapter Rhodora A. Ngolob, Assistant Regional Director for Technical Services of DOST-CAR Nancy A. Bantog, President of PCCI Benguet Chapter Rex D. Balong-Angey, and Executive Director of PCCI Benguet Chapter Trinidad Cayading-Trinidad.

"In recent years, DOST has been in the forefront of creating conducive business environment for MSMEs to allow them to develop quality products and increase efficiency," said DOST Secretary Mario G. Montejo"

According to Sec. Montejo, building a partnership with PCCI will further improve the quality of assistance that DOST is providing to various local firms in CAR, particularly under Small Enterprises Upgrading Program or SETUP.

SETUP is a nationwide strategy to encourage and assist MSMEs to adopt technological innovations that will improve their business operations. The said program offers MSMEs equipment and technical assistance to upgrade the quality of their products and services in order to conform to national and international standards of excellence.

SETUP assists some 3,000 MSMEs all over the country every year. From January to June 2015 alone, a total of 1,236 firms have been given assistance.

"DOST-CAR and PCCI-CAR will work together to promote business growth and sustainable development among MSMEs sector in the region through providing advance knowledge on entrepreneurships," Montejo added.

"Our region (CAR) has been blessed with different raw materials that can be used in producing innovative products and could make waves in the world market. In DOST, we always fully maximize this potential through various S&T interventions. We believe that Science and Technology is an enabler and empowering tool that would help level the playing field for our MSMEs in today's smarter economies," DOST-CAR Director Julius Caesar Sicat said.

The MOU signing between DOST-CAR and PCCI-CAR was part of Science Nation Tour leg in the said region.

PROJECT VISITS. During the Science Nation Tour at the Cordillera Administrative Region, Jennifer A. Calawa (right), manager of SETUP beneficiary Green Salad Farms, shows the various crops in their greenhouse at Guisguisaan, Mount Data, Bauko, Mountain Province. Meanwhile, Abigail Ballo, (inset) member of St. Bede Mushroom and Vegetable Growers Association shows their Oyster Mushroom facility at Monamon Sur, Bauko, Mountain Province. Both firms achieved an increase in production and gross sales after the technological interventions given to them through SETUP. (*Text by Ma. Lotuslei P. Dimagiba, S&T Media Service, DOST-STII*)

DOST Sec. Mario G. Montejo (middle) with the Science Ambassadors of Cordillera Administrative Region (CAR) during the Stakeholders' Night at CAP Convention Center in Baguio City, namely (holding plaques, from left) DOST Balik Scientist Dr. Daniel C. Peckley Jr.; Mayor of Rizal, Kalinga Hon. Marcelo V. Dela Cruz Jr.; Mayor of Bauko, Mountain Province Hon. Abraham B. Akilit; UP Baguio Chancellor and Cordillera Regional Health Research and Development Council Chairperson Dr. Raymundo D. Rovillos; Benguet State University President Dr. Ben D. Ladilad; Baguio City Mayor Hon. Mauricio G.Domogan; and PIA-CAR Regional Director Dr. Helen R. Tibaldo. Also with them in photo are DOST-CAR Regional Director Dr. Julius Caesar V. Sicat (left), DOST Assistant Secretary for Countryside Development Dr. Urdujah A. Tejada (2nd from left), and DOST Undersecretary Rowena Cristina L. Guevara (right). *(Text by Ma. Lotuslei P. Dimagiba / Photo by Arjay C. Escondo, S&T Media Service, DOST-STII)*

DOST Secretary Mario G. Montejo (4th from right) turns over DOST's internationally acclaimed digital science library, STARBOOKS or Science and Technology Academic and Research-based Openly Operated Kiosks, to CHED-CAR represented by Regional Director Dr. Romulo H. Malvar (4th from left) and representatives of DepED-CAR at CAP Convention Center in Baguio City. The first of its kind in the Philippines, STARBOOKS is a stand-alone research platform with a user-friendly interface. It requires no Internet connection and contains science information from local and international sources. *(Text by Ma. Lotuslei P. Dimagiba / Photos by Arjay C. Escondo, S&T Media Service, DOST-STII)*

DOST-ARMM helps raise organic farming in Mamasapano

Al Rahman Farmers Multi-Purpose Cooperative chair Modrika Masukat (second from left) introduces new hybrid rice varieties to (from left) Chief of Communication Resources and Production Division of DOST- Science and Technology Information Institute Dr. Aristotle Carandang, DOST-ARMM Secretary Myra Mangkabung, DOST Region 11 Director Dr. Anthony Sales, and DOST- Technology Application and Promotion Institute Director Engr. Edgar Garcia.

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

MAGUINDANAO HAS been striving to rise up from the past as can be seen on the way it opens its door to new developments. The province is actually home to immense farmlands, a perfect place for agricultural innovation and a wealth of opportunities.

To help boost the production of farms in Maguindanao, the Department of Science and Technology- Autonomous Region in Muslim Mindanao (DOST-ARMM) is providing much-needed assistance to hundreds of farmers.

Among the beneficiaries of DOST-ARMM's support to farmers is the Al Rahman Farmers Multi-Purpose Cooperative. Just last year, the cooperative received the 1.2- million-peso Foliar Organic Fertilizer and Vermi Cast Production Project and the P555,000 Complementary Food Production Project from DOST- ARMM.

Located at Brgy. Manungkaling, Mamasapano, Maguindanao, Al Rahman is engaged in organic farming of varieties of plants, which started its operation in 2000. It covers 250 hectares of farmland and now has 180 members.

The grant received by Al Rahman includes upgrading of facilities and equipment for Foliar Organic Fertilizer and Vermi Cast Processing. Said equipment include a shredder machine for vermin composting, weighing scale, 50 units of vermin cast beds, shaving machine/ screen, hanging air dryer, pressure tank water system, bag closer shredder machine for foliar organic fertilizer production, fermentation jar/ container, and mechanized mixer and sealer.

Assistance from DOST-ARMM also includes product testing for standardization and product improvement, and technology trainings and training on Good Manufacturing Practices (GMP) and packaging and labeling.

On the other hand, the Complementary Food Project includes provision of technologies for the roll-out of complementary/snack foods developed by the Food and Nutrition Research Institute. The establishment of processing plant for complimentary food thru the assistance is based on GMP and Quality Assurance standards which will be operated for institutional and commercial markets.

Modrika Masukat shows varieties of organic sesame and monggo seeds to project visitors at Al Rahman.*(Photos by Gerardo G. Palad, S&T Media Service, DOST-STII)*

Al Rahman Chair Modrika A. Masukat assures that the coop's products are all organic, and that the coop promotes organic farming.

The cooperative is also providing readily available organic fertilizer for the farmers in the province to help farmers restore the natural fertility of the soil and reduce farm production cost.

"All (of) the products of Al Rahman are Halal as they are into organic farming. The coop is on the process of Halal certification. They are under the One-Stop-Shop Product Development (of Tecknolohiyang Pangkabuhayan), and they are now in the stage of production. After that, we do the packaging and labeling, then the Halal certification," said DOST-ARMM Secretary Myra Mangkabung.

Apparently, production by the cooperative was temporarily stopped in the past months due to the Mamasapano incident which happened in January 2015. But the operation has now resumed.

"Our main goal now is to produce more crops and help our farmers," said Masukat who just got back from hajj the day before the project visit at Al Rahman. After the acquisition of assistance from DOST-ARMM, Al Rahman now earns around P200,000 per harvest of its organic rice.

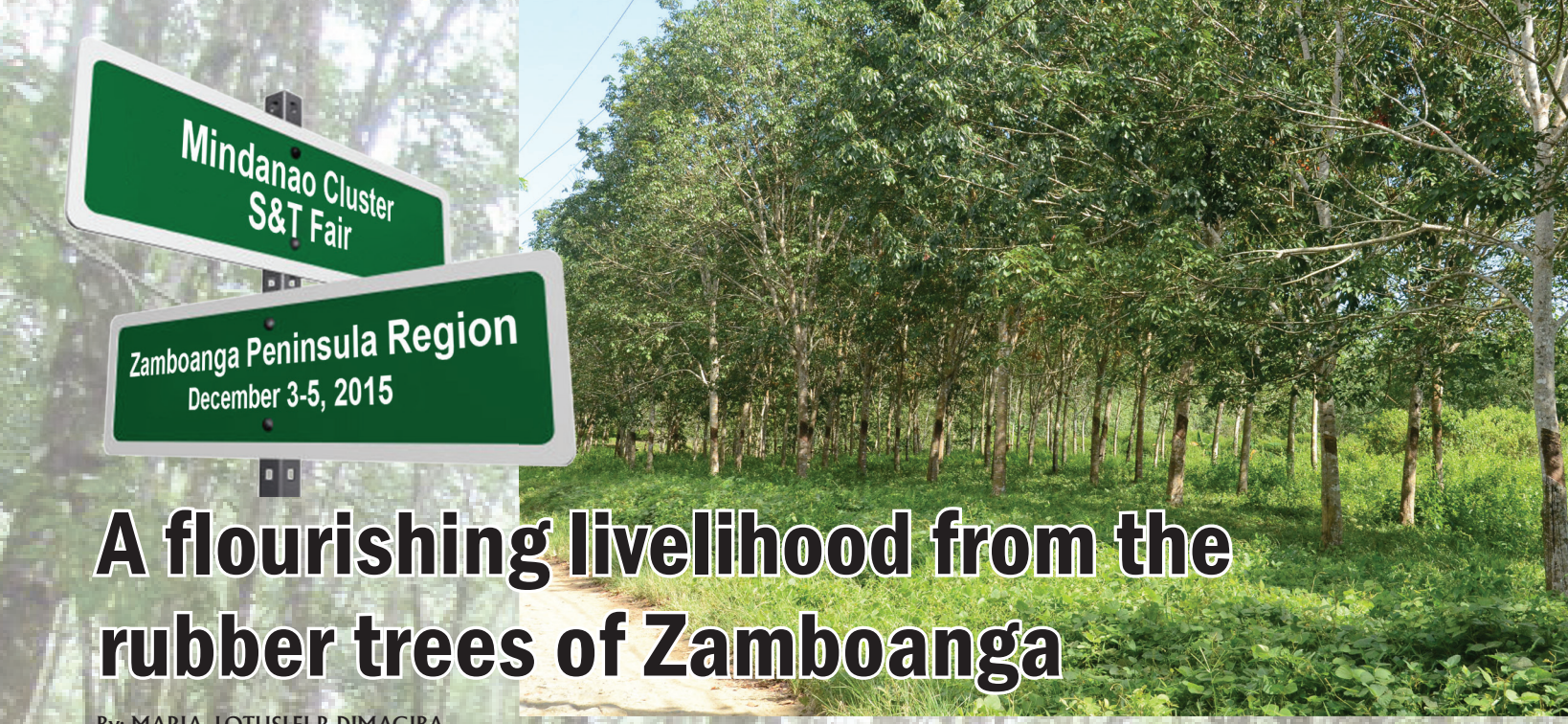
As of now, the products of the coop are being sold in the local markets within the province of Maguindanao. The local government, on the other hand, buys the coop's products for feeding programs.

"We will show our fellow Filipinos sthat Maguindanao is not a violent place through these kinds of interventions. There are definitely lots of rooms for peace and innovation in our beautiful province," Sec. Mangkabung stated.

Signatories sign the commitment of support to the development of Halal Industry in the ARMM.

FIRST HALAL CONGRESS (From left) Muslim Mindanao Halal Certification Board Incorporated Executive Director Mariam Daud, DOST-ARMM Secretary Myra B. Mangkabung, and Halal International Chamber of Commerce and Industries of the Philippines President Alexander Sultan sign the Memorandum of Understanding that will strengthen the collaboration between these Halal-certifying agencies and DOST-ARMM during the ARMM Halal Congress, the first ever in the region, which was part of the celebration of Science and Technology Week.

YOUTH AMBASSADOR Ahmed Ibn "Amin" Turabin Hataman was named S&T (Science and Technology) Youth Ambassador. The youngster was among the region's roster of S&T Ambassadors composed of academicians, politicians and youth achievers. They were Hon. Sulog G. Bra, PhD; Jumelita B. Romero, PhD; Filemon G. Romero, PhD; Hon. Cahar P. Ibay; Yusop T. Alano; Hon. Abdelrazi A. Amin; Hon. Janimah D. Randi; Atty. Lorenzo R. Reyes; Ahmed Ibn "Amin" Turabin Hataman; and Hon. Mujiv S. Hataman. The appointed envoys will be DOST's partners in championing S&T programs in ARMM.



A flourishing livelihood from the rubber trees of Zamboanga

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

RUBBER TREES have always been known to produce a milky white sap known as latex and it has been used in many ways in ancient times. Today, modern processing of the latex sap from rubber trees has been generating income for the local community.

Zamboanga Peninsula is considered the top producer of natural rubber in the country. With this flourishing industry, a major challenge is to ensure that the state and quality of their rubber and rubber products comply with industry regulations and market requirements.

The Philippine Rubber Industry Association (PRIA) identified the need for a rubber testing facility in the country to provide objective evidence using scientific approach of the rubber's state and quality.

To address this challenge, the Department of Science and Technology (DOST) provided funds to set up a laboratory testing facility that will analyze the quality of natural rubber crumbs.

The rubber testing laboratory located at the DOST Region IX compound at Pettit Barracks, Zamboanga City has the capability to test these parameters: Dirt Content, Nitrogen Content, Ash, Volatile Matter, Plasticity Retention Index, Mooney Viscosity and Color.

Daniel Revantad, manager of Philippine Pioneer Rubber Product Corporation, shows some of the natural rubber in their facility.

Rosemarie S. Salazar, head of the Regional Standards and Testing Laboratory of DOST Region IX and Sonoro L. Buñag, technical manager of the chemistry laboratory, enumerated the significance of these parameters.

First, Dirt Content helps detect adulteration in the product for it affects the processing of rubber and its quality. Nitrogen Content indicates possible adulteration with skim latex if content is high. Ash Content helps detect adulteration with clay, talc, sludge and silicates and coagulants such as sulfuric acid and phosphoric acid. Meanwhile, Volatile Matter indicates dryness of the rubber as wet rubber may develop molds and putrefactive odor. Plasticity Retention Index on the other hand, measures the resistance of rubber to oxidative degradation or aging. Mooney Viscosity characterizes the ability to process the rubber and lastly, Color determines the grade of rubber crumbs.

All these parameters are important in establishing the quality of the natural rubber crumbs.

The facility is equipped with Plastimeter, Mooney Viscometer, Kjeldahl Block Digestion and Distillation System, Furnace, Laboratory Mill, Aging Chamber, Analytical Balance, Ultrasonic Bath, and Hydraulic Press.

To further elevate the rubber industry in Zamboanga, DOST assisted the Philippine Pioneer Rubber Product Corp. (PPRPC) in La Paz, Naga, Zamboanga through its Small Enterprise Technology Upgrading Program (SETUP). The program provides assistance to micro, small and medium enterprises (MSMEs) through funding, technology upgrade, and manpower training.

According to PPRPC Manager Daniel Revantad, SETUP helped them compete in the rubber industry. "Naisip namin nung palapit itong ASEAN Integration, hindi na pwedeng yung produkto mo na 'pwede na', kailangan pwedeng pwede (We thought that with the coming ASEAN Integration, you can no longer make do with a so-so product. It should be excellent). You have to cope with the standard," Revantad said.

DOST assisted PPRPC with a technology intervention worth P8,276,800 for the improvement of their system and product and manpower development. Two units of slab cutter and two units of blending tanks were delivered and installed in the plant.

The PPRPC provides milling services to rubber-producing cooperatives, rubber farmers and traders. It was organized in 2000 as a federation of six agrarian reform communities which enabled them to avail the SETUP assistance. The production increased by 25% and they now provide better quality and faster service to rubber farmers and traders, became compliant to ISO 2000 quality standards, and generated 23 additional employees, from 127 to 150.

Another SETUP adoptor in the region is Monmon Bakeshoppe and Snack Haus. Owned by Selyna D. Ventura, the bakeshop was also given assistance through upgrading of their bakery facility to meet the growing demand of customers. The bakeshop was able to employ eight additional employees from their regular five women workers, increased gross sales by 11.3%, and improved product packaging.

DOST continuously supports and makes science felt by the people of Mindanao. Last December 3-5, the Mindanao Cluster Science and Technology (S&T) Fair was held at Marcian Garden Hotel in Zamboanga City where one of the activities was the launching of the rubber testing facility. It showcased various technologies and innovations as well as exhibits, seminars and forums entitled SETUP: Where We Are and the Way Forward, Sci-Tech Campus Journalism Training-Workshop, and Research Forum for students, entrepreneurs, stakeholders, local government units, the private sector and MSMEs - all of which aim to make the Philippines a Science Nation.

(Left) SETUP assisted products displayed during the fair.

(Below) Selyna D. Ventura (left), owner of Mon-Mon Bakeshoppe together with her eldest daughter pose for a photo with the new packaging design of their product courtesy of SETUP.

Photos by Gerardo Palad, S&T Media Service, DOST-STII

(From left) Dr. Anthony C. Sales, chair of DOST Mindanao Cluster and regional director of DOST Region 11; Edgar I. Garcia, director of Technology Application and Promotion Institute; Hon. Maria Isabelle Climaco, mayor of Zamboanga; Dr. Rowena Cristina L. Guevara, DOST undersecretary for S&T services; Dominga D. Mallonga, regional director of DOST-CARAGA; together with Brenda L. Nazareth-Manzano, regional director of DOST Region IX, cut the ribbon to mark the opening of the Mindanao Cluster S&T Fair 2015 at Palacio del Sur, Marcian Garden Hotel, Zamboanga City.

Montejo salutes Pinoy entreps in DOST-NCR's "Science Festival"

Until now, Kamuning Bakery Café continues to serve its clients with artisanal, high-quality and pugon-style baked products.

The Spiral Mixer is one of the production equipment that Kamuning Bakery Café was able to acquire through SETUP. The said equipment can help produce large quantities of dough continuously.

Wilson Lee Flores, owner of Kamuning Bakery Cafe, shares with Department of Science and Technology (DOST) Secretary Mario G. Montejo and DOST-National Capital Region Director Teresita Fortuna the bakeshop's rich past and how DOST's assistance, via SETUP, really helped to increase their production and expand their operations.

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

THE VERY important role of micro, small and medium enterprises (MSMEs) in fueling economic development in the country was recently recognized by no less than Secretary Mario G. Montejo of the Department of Science and Technology (DOST) during its Stakeholders Summit held on December 9, 2015 at the DOST Executive Lounge.

The Stakeholders Summit was part of several activities under the National Capital Region leg of the Science and Technology Information Institute's Science Nation Tour dubbed "Science Festival," held from December 7-11, 2015

"Today I acknowledge the technopreneurs as they are our steadfast partners in development by using the power of science, technology and innovation," said Montejo, himself a proponent of MSMEs having been an inventor and technopreneur before he joined government service.

DOST has for many years been a staunch advocate of MSMEs and has been supporting thousands of Filipino entrepreneurs through one of its flagship programs - the Small Enterprise Technology Upgrading Program or SETUP, which extends assistance via funding, technology upgrading, and training. SETUP's outstanding adoptors for 2015 were also given recognition at the Stakeholders Summit.

"What is important for us at DOST is to harness the creativeness and innovativeness of our entrepreneurs using S&T for the benefit of Mang Juan and Aling Maria," Montejo added, "and that is why we call our motto 'Agham na Ramdam' because it is us Filipinos who chart our course and we must build our own capabilities."

The Science Secretary also cited the inroads of the DOST in disaster preparedness and mitigation through another flagship

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AMAZING SCIENCE RACE. High school students take part in "Amazing Science Race," the Department of Science and Technology's (DOST) version of the popular reality TV show "Amazing Race". Top photo show the participants accomplishing their tasks at DOST's Science and Technology Information Institute (STII) - one of the designated stations of the race where they used STII's STARBOOKS. Sto. Nino Catholic School (right, top photo) topped the private school category after finishing all the challenges in 11 designated stations in just 44 minutes and 33 seconds while schools in the combined divisions of Las Piñas and Makati cities (right) reigned in the public school category after accomplishing all the same obstacles in just 32 minutes and 9 seconds. *(Text by Espie Angelica A. de Leon / Photo by Allan Mauro V. Marfal, S&T Media Service, DOST-STII)*

IT'S NEVER TOO EARLY TO LEARN ABOUT SAFETY. Students who are members of Batang Emergency Response Team from different schools in Metro Manila participate in the Rescuelympics organized by Department of Science and Technology. Left: Students make an improvised floating device out of empty soda bottles. Right: One-man carry technique being done by two of the participants. . *(Text and photos by Maria Luisa S. Lumioan, S&T Media Service, DOST-STII)*

SCIENCE AMBASSADORS Carl Balita Review Center Chief Executive Officer and radio show host Carl E. Balita and Philippine Center for Entrepreneurship-Go Negosyo Executive Director Ramon Lopez (2nd and 3rd from left respectively) were named Science Ambassadors during the Department of Science and Technology's (DOST) Science Nation Tour (SNT) for the National Capital Region. As Science Ambassadors, Balita and Lopez will promote the application of science and technology (S&T) for inclusive growth and increase the exchange of scientific information among the public in order to tap S&T's ability to propel the country toward national development. With them in photo are Director Dr. Teresita C. Fortuna and DOST Secretary Mario G. Montejo. (*Text by Espie Angelica A. de Leon / Photo by Gerardo G. Palad, S&T Media Service, DOST-STII*)

DOST AWARDS SUNLIGHT FOODS CORP Engr. Crispin Muryong Jr. and Mrs. Maria Luz Muryong (2nd from left), owners of Sunlight Foods Corporation, receive a plaque of recognition from Department of Science and Technology-National Capital Region (DOST-NCR) Assistant Secretary Urdujah Tejada (left) and DOST-NCR Director Teresita Fortuna. Sunlight Foods Corporation, engaged in the production of sweet preserves such as ube, makapuno, langka, and buko (right), was declared as the Best SETUP adoptor for 2015 in the region. *(Text by Maria Luisa S. Lumioan, S&T Media Service, DOST-STII)*

NCR Regional Invention Contests and Exhibits winners

By MARIA LOTUS LEI P. DIMAGIBA
S&T Media Service, *DOST-STII*

LAST SEPTEMBER 30, 2015 the Department of Science and Technology (DOST) thru Technology Application and Promotion Institute Director, Engr. Edgar I Garcia and DOST-NCR Director, Dr. Teresita C. Fortuna announced the winners of the 2015 Regional Invention Contests and Exhibits (RICE) :

Outstanding Invention (Tuklas Award) - Pre-Cast Composite Block-Panel with Assembly of Recycled Cylindrical Cardboard Rolls Infill by Eduardo P. Urcia

Outstanding Utility Model - The Green Eco-Toilet System by Daniel A. Camacho

First Runner-up: Paper Clay/ Paper Clay Art by Marita Gatus Morales

Second Runner-up: Ambulatory Deployable Rescue Command Center by Lito De Leon Jr.

Outstanding Industrial Design - Model 3 Solar Powered Road Marker by Percival G. Barba

Outstanding Creative Research (Likha Award) - Lamp Primers for white spot syndrome virus by Dr. Mary Beth B. Maningas of Research Center for the Natural and Applied Sciences, UST

First Runner-up: Portable Botcha Detector by Jonathan C. Briones and Dr. Gil Nonato C. Santos, DLSU

Second Runner-up: Pelvic Model for Pelvic Organ Prolapse by Maria Teresa C. Luna, M.D., Department of Obstetrics and Gynecology, UST

Outstanding Student Creative Research (Sibol Award) High School Level - Three-wheeled Multipurpose Bag Trolley Efficient in Going up and Down Stairs by Renaissance E. Tanguingcen, Manila Science High School

First Runner-up: (FuSuCo) Fuel Supply Controller as an Anti-Carnapping Device by Sophia Jolejole, Grace Lui and Christine Marcelo, Manila Science High School

Second Runner-up: The feasibility of Euchemadenticulatum (Guso seaweeds), Caulerpalentillifera (Latok seaweeds) and Dolabellaauricularia (Donsol seaweeds) as components of Bioplastic by Janssen Kyle G. Hayag, Allyson P. Dargantes, Charlene Diane M. Reyes, Kirby Rey S. Salarda, Abbygale A. Regencia and Karen Claire D. Tagarao, Pasay City Science High School

Third Runner-up: A Multi-faceted Window Design: Arduino Controlled Emergency Escape Window Design using MQ-2 Smoke Sensor Circuit by Alec Denji S. Santos, Ma. Theresa Angela B. Gaviola, Simon Clark C. Carillo, Daryl C. Talabo and Kaila Nicole R. Jaucian, Valenzuela City School of Mathematics and Science

Outstanding Student Creative Research (Sibol Award) College Level - Prototype Development of a Flow Perfusion Taylor-Couette-Poiseuille Double Chamber Bioreactor for Tissue Engineering of Trachea by Ralph Domondon, Alvin Salmingo, Jainie Lynn Rivera, Hubert Bakal, Ronnel Batarilan, Pascal Clutario, Alexis Pulhin, Argie Adduru, Technological Institute of the Philippines - Manila

First Runner-up: Improvised Assistive Electronic Haptic Device for Functional Mobility of visually Impaired Individuals by Rogiel Zedrix Valdez, Manila Central University

Second Runner-up: Ultrasonic Testing Meter for Cocoa Maturity by Beverly D. Ampo, Leonard C. Policarpio, Kaila R. Manalad, and Jack Herbert De Vera, Technological Institute of the Philippines – Quezon City

Third Runner-up: Detection of Microbial Contamination in Dialysis Water using Biolimenescent Bacteria Isolated from Squid (Photololigochinensis) by Jim Bryan A. Uy, Pamantasan ng Lungsod ng Maynila

Fourth Runner-up: Anti-inflammatory Adhesive Bandage out of Guava Psidium Guajava Leaves by Irish S. Fruto, Charlotte M. Roxas, Marnie P. Patigayon and Rhodalia M. Salamat, Marikina Polytechnic College

Engr. Edgar I Garcia, director of Department of Science and Technology's Technology Application and Promotion Institute (DOST-TAPI) and Dr. Teresita C. Fortuna, director of DOST-NCR awards Eduardo P. Urcia for winning the Outstanding Invention or Tuklas Award for his invention called "Pre-Cast Composite Block-Panel with Assembly of Recycled Cylindrical Cardboard Rolls Infill" during the 2015 Regional Invention Contests and Exhibits awarding ceremony at the Technological Institute of the Philippines in Quezon City. *(Photo by Gerry Palad / Text by Ma. Lotuslei Dimagiba)*

SIBOL Award Outstanding Student Creative Research for College winner Guyabano Treatment for UTI by Marida Dalgan et. al of Mindanao State University- Maguindanao. *(Photo by Gerardo Palad, S&T Media Service, DOST-STII)*

ARMM invention qualifiers off to 2016 national contest

By MARIA LOTUS LEI P. DIMAGIBA
S&T Media Service, *DOST-STII*

THE DEPARTMENT of Science and Technology- Autonomous Region in Muslim Mindanao (DOST-ARMM) recently announced the qualifiers to the 2016 National Invention Contest and Exhibits (NICE).

DOST-ARMM made the announcement in a ceremony that capped this year's ARMM Science and Technology Week celebration.

The weeklong celebration included the 2015 ARMM Regional Invention Contests and Exhibits (RICE), a biannual nationwide activity organized by the Technology Application and Promotion Institute (DOST-TAPI). RICE is conducted in different regions to recognize the indispensability of the Filipino inventors in the country.

Ten researchers, schools and professionals from around ARMM vied for the awards' three categories to represent the region in the prestigious NICE in July 2016.

The following emerged as the qualifiers of 2015 ARMM RICE:

SIBOL Award: Outstanding Student Creative Research for High School

Winner: Homemade Clay Bricks with a Twist by Melyka Krishna Sabtal et. al, MACFI Laboratory High School in Basilan

First Runner-up: Solar-Powered Power Bank by Paula Nicole Bataga, ARMM Regional Science High School in Maguindanao

Second Runner-up: Wooden Charcoal Painting by Junaira Mangigin, Sultan Mangalampa Daing National High School in Lanao Del Sur

SIBOL Award: Outstanding Student Creative Research for College

Winner: Guyabano Treatment for UTI by Marida Dalgan et. al, Mindanao State University- Maguindanao

First Runner-up: Cassava Crumble with Dried Ipil Leaves for Poultry Productions by Jollybee E. Belandres, Basilan State College

LIKHA Award Outstanding Creative Research

Winner: Adlay and Marang By-products by Nilda S. Longno et. al, Department of Agriculture and Fisheries- ARMM Integrated Agricultural Research Center (DAF-ARMMIARC)

First Runner-up: Kamansi Seeds Powder: Its acceptability as coffee by Mahera M. Salik et. al, Mindanao State University-Maguindanao

Among the criteria for judging were originality, creativity/methodology, degree of inventiveness and development, commercial viability, usefulness, aesthetics, uniqueness, presentation and demonstration.

Inventor Jose L. Guardo Jr. explains the maglev technology to (top photo, from left). Dr. Anthony C. Sales, regional director of DOST-11; Dr. Aristotle P. Carandang, chief of the communication resources and production division of DOST's Science and Technology Information Institute; and Engr. Edgar I. Garcia, director of DOST's Technology Application and Promotion Institute, and others who visited the 2015 Regional Invention Contest and Exhibits at the NCCC Mall in Matina, Davao City. *(Photo by Henry A. de Leon, S&T Media Service, DOST-STII)*

Davao inventor develops 'Maglev' train, DOST to support prototype

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

A DAVAO-BASED inventor proposes a cutting-edge technology to end the mass transport woes: a magnetic levitation or maglev train system.

Maglev technology is an efficient mass transport system that uses magnetic levitation to move vehicles without touching the ground. It travels along a guideway similar to the Department of Science and Technology's Automated Guideway Transit in UP-Diliman and in Bicutan, Taguig City. Moreover, maglev technology can only be seen in some progressive countries such as Germany, China, and Japan among others.

Meanwhile, inventor Jose L. Guardo Jr.'s solution to the public transportation problems went public in style during the 2015 Regional Invention Contest and Exhibits at the NCCC Mall in Matina, Davao City.

Guardo's patented maglev technology is an elevated ultra-lightweight, mid to high-speed hybrid monorail that uses dynamic hybrid magnetic array rotary propulsion wheel system, which according to him is ideal in transporting commuters from the urban and provincial route.

This means that at the bottom of the coach are components with a mix of electromagnets and neodymium iron boron, a rare earth magnetic material. These magnets are designed to create repulsions from the lower part that enables the train to levitate and propel the coach.

The train is also capable of making sharp curves of up to 15 meters. It has a track width of about 1.8 meters x 2.5 meters, which may still provide a view of the Manila skyline. It can run as fast as 200 kilometers per hour and can slow down a bit for shorter runs.

The development of the maglev is cheaper as it will use aluminum as guideways. It will also use regenerative energy that returns energy to an inverter when the motor decelerates. Solar panels shall be installed on the terminal rooftops.

DOST support to inventor

During the opening of the RICE in Region 11, Technology Application and Promotion Institute Director Edgar Garcia elaborated that the country is steadily producing patents through various inventions that became commercially available in both local and international markets. Patents, Garcia said, is one of the basis for a country's global competitiveness. "Before we were ranked 85th among the 147 countries in the global competitiveness rankings, but now we are at 47th and the Philippines is the fastest ASEAN country to achieve such feat," Dir. Garcia said. "That is why the DOST's support to our inventors is in full swing."

At the press conference that followed, DOST Region 11 Director Anthony Sales and Director Garcia gave their commitment to further develop the maglev train into a working prototype. Director Sales said that a one-kilometer track requirement suggested by the maglev proponents shall be installed in the DOST property in Bago Oshero to further develop and test the reliability of the invention.

Bountiful harvest. DOST Secretary Mario G. Montejo (rightmost) and Senator Cynthia A. Villar (2nd from right) hold a bountiful harvest of rice stalks during the field test of the carrageenan fertilizer additives in Brgy. Balatong B, Pulilan, Bulacan. Also in photo are Pulilan Mayor Vicente 'Enteng' Esguerra and Sec. Montejo's spouse, Mrs. Maritz O. Montejo. *(Photo by Gerardo Palad, S&T Media Service, DOST-STII)*

Farmer boosts rice production through DOST seaweeds technology

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

PULILAN, BULACAN- Mang Noel Mauricio, a rice farmer in this agricultural municipality, has seen many ricefields damaged badly by typhoons in the past. However, he has never seen such an occurrence when rice crops did not stoop down amidst a raging typhoon.

"Kung makikita ninyo, yung mga katabing palayan namin, lahat yan nakayuko. Nagtatanong nga ang aking mga kapitbahay kung ano ang inilagay ko daw ba sa palayan ko doon sa tabing-kalsada, ay ang sabi ko ay yung ibinigay sa akin ng DOST (If you will look at the adjacent rice fields, all of their crops are bent. My neighbors have been asking what kind of fertilizer I used. I told them it was from DOST), exclaimed Mang Noel.

Mang Noel is the owner of the two-hectare ricefield in Pulilan, Bulacan that was the subject of a product test for a rice fertilizer additive made out of carrageenan developed by experts from the Department of Science and Technology (DOST) and National Crop Protection Center-University of the Philippines-Los Baños (UPLB-NCPC).

Carrageenan is a substance mostly made up of carbohydrates bonded together which are extracted from edible seaweeds and commonly used as thickener and stabilizer for food or binder in personal care products.

Mang Noel also noted another difference in his crops as they reach the end of the crop cycle just before harvest when leaves usually become dry: "Makikita nyo, kulay berde pa ang ibang dahon, maganda yan kasi ibig sabihin nyan, patuloy pa rin ang potosentisis o yung paggawa ng pagkain ng pananim (If you will look at the crop, some of it still has green leaves, which is good because it means the photosynthetic activity is continuous).

The fertilizer additive, called Carravita for carrageenan and vitamins, helps rice crops develop stronger stem structure and stimulate growth. It also gives more grain yields compared to normal planting procedure according to Dr. Gil L. Magsino of UPLB-NCPC. It was initially introduced to more than 100 rice farmers in the municipality recently.

Mang Noel during the interview

Dr. Magsino added that carrageenan as fertilizer has been used unsuccessfully in the past but through modern technology, experts were able to degrade it into nanoparticle size to make it more absorbable by crops.

He explained further that using Carravita by combining 20 ml per liter per hectare and three to six bags of fertilizers, will produce a yield with a grain weight of 65.4% and a panicle length of 3.5 up to 12.5%.

More importantly, Carravita provides crops with more resistance to diseases such as Rice Tungro and Bacterial Leaf Blight (BLB).

Rice Tungro disease is caused by the combination of two viruses, which are transmitted by leafhoppers. It causes leaf discoloration, stunted growth, reduced tiller numbers and sterile or partly filled grains.

BLB on the other hand, caused by the Xanthomonas oryzae pv. Oryzae, results to wilting of rice seedlings, yellowing and drying of leaves.

Because Carravita is made from edible seaweeds, it is safe for humans and is guaranteed to be earth-friendly when sprayed into the crops.

Moreover, Mang Noel Mauricio added that the Carravita has other characteristics that help in the growth of the rice crops. "Mabuti itong gamit sa tingin ko kasi yung mga mabubuting kulisap ay nai-engganyo sila doon sa mga palayan. Meron kasing mga kulisap na nakakatulong sa paglago ng mga pananim na palay (I think this [Carravita] is good because it entices friendly bugs that help in the growth of the rice crop.)"

Currently, UPLB-NCPC is continuously developing the product as positive results are seen on the project's multi-location trials.

DOST Secretary Mario G. Montejo, who was present during the field presentation, was greatly elated by the results. Montejo expressed his hope that after the development of the product, DOST can initially fund its production so that farmers across the country can avail it for free.

"Tinitingnan din natin kung maaari itong gamitin sa iba pang mga pananim gaya ng manga at mga gulay dahil kailangan nating patuloy na mapalago ang industriya ng agrikultura (We are also looking into the possibility of using this for other crops like mango and vegetables because we need to support the growth of the agriculture industry)," said Montejo.

Meanwhile, Senator Cynthia Villar, chair of the Senate Committee on Agriculture and Foods went to see the crops that were ready for harvest. She encouraged farmers to continue producing agricultural products for the country. "The sector that will sustain our food production are not the corporate farms," the Senator said, "but farmers like you who own family farms."

Carrageenan's use as plant promoter was first studied by DOST's Philippine Nuclear Research Institute (PNRI) through a research done several years ago. The research showed that when used as foliar fertilizer, PNRI's carrageenan-based plant growth promoter can improve plant photosynthesis and enhance nutrient absorption of the roots.

The research and development for the product is supported by the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development, another DOST agency.

"Obesity gene" probed in the Filipino population

By JACUS S. NACIS
S&T Media Service, *DOST-FNRI*

IN ORDER to understand weight gain and weight loss, we need to look into the triad of environment, lifestyle, and genetics.

The pairing of environment and lifestyle as a factor in understanding body weight is an established norm.

Adding genetics in the picture bring forth quite interesting tales to tell.

Previous researches about the fat mass and obesity associated (FTO) gene suggested that individuals who have the high risk version of the FTO gene have the tendency to become obese. FTO gene comes in two versions: the high and the low-risk form.

The BBC News website in 2013 reported that individuals with high risk copies of the FTO gene are thought to be 70% more likely to become obese.

This BBC report was investigated further by a pioneering study on nutritional genomics by the Food and Nutrition Research Institute of the Department of Science and Technology (FNRI-DOST).

Researchers from FNRI-DOST examined more than a hundred Filipino adults from Ilocos, Bicol and Metro Manila.

The FNRI study focused on the possible contribution of the FTO gene in the increasing trend of obesity in the country. The study combined the utility of polymerase chain reaction (PCR) and gene sequencing technology to determine the versions of the FTO gene.

Majority of these adult participants carry the low-risk version. However, regardless of the body mass index (BMI), more than 30 percent harbor the high risk version of the gene.

The genetic tendency towards becoming obese in this portion of Filipino adults is present even among those who are considered normal and healthy.

The high risk version posed 24 percent chance of gaining more weight compared to those who have the low risk version of the FTO gene.

Interestingly, the probability increased twice when the carrier of the high risk version of the gene falls short of the recommended energy nutrient intake (RENI) for energy, protein, carbohydrates, and fat.

Relevant findings of the study underscore the importance of meeting the recommended dietary intake especially when an individual is prone to gain more weight due to genetic variation.

In this segment of the Filipino adult population, the effect of the high risk version of the FTO gene is not the sole contributor of the propensity to gain weight.

Genes might regulate the capture, storage, and release of energy from the foods that we eat but it is equally important to note that obesity also thrives in an environment abundant with calorie-rich foods and with fewer opportunities for physical activity.

With the Philippines going more urbanized, the environment previously described can perhaps be a relevant factor of the population shifting towards unhealthy weight gain. This premise, however, needs to be confirmed further.

Without dismissing what genetic factors can contribute to our total well-being, the need to live a healthy lifestyle through proper diet and regular exercise is still the best way to combat unhealthy weight gain.

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Study surveys PH seafaring industry, recommends policies

By JAIME M. RAGOS
Science Research Specialist II, *DOST-NRCP*

THE SHIPPING industry plays a crucial role in globalization. This is due to the fact that the international shipping industry carries about 90% of the world trade as sea transport proves to be the most cost-effective way to transport goods and raw materials from one country to another.

Meanwhile, 25 percent of seafarers plying international waters are Filipinos serving as stewards, ratings, and officers. Overseas Filipino seafarers' remittances reached US$1.093-B in 2001, US$5.525-B in 2013, and US$5.576-B in 2014, thus bolstering the Philippine economy.

Indeed, seafaring helps boost domestic economy, supportive of the accomplishment of the Philippine development plan for a safe, efficient, competitive, and environmentally sustainable Philippine transport system. A responsible and modern Philippine registered fleet manned by quality seafarers and well-functioning shipyards are similarly envisioned by the Philippine government.

With this industry especially benefitting developing nations like the Philippines, a research project funded by the National Research Council of the Philippines, was conducted from April 2014 – April 2015 by Dr. Angelica M. Baylon, distinguished researcher and director for external relations of the Maritime Academy of Asia and the Pacific.

Titled "Manning Productivity Gain Cycle and Emerging Industries in the Philippines," the research project dealt with the manning industry and its contributions to the shipping industry

Methods

To analyze its impact on the shipping industry and the attainment of the Philippine Development Goals and ASEAN 2015 integration, Dr. Baylon used documentary analysis of existing data from key maritime stakeholders and the Philippine government represented by the Philippine Overseas Employment Administration, Maritime Industry Authority, and Department of Labor and Employment, among others.

Additional data were used, such as the knowledge and insights of seafarers and maritime leaders gained through interviews, surveys, conferences, fora, focus group discussions, and other meetings. Visits to government websites and utilization of foresighting methods were also resorted to.

Likewise, a SWOT analysis of the Philippine manning industry and its impact on issues pertaining to graduates of maritime education and training was also made to achieve international competitiveness. Based on CHED data, the period 2003 to 2014 saw an increase in the number of enrolees in pre-baccalaureate and doctoral maritime programs.

Characteristics of Filipino seafarers and the local maritime industry

With the Philippines' modern registered fleet manned with quality and desirable Filipino seafarers, the country maintains a stable trade, combined with stable national development and national security.

As identified by the research respondents, Filipinos who become leaders in the shipping industry are hardworking, self-disciplined, team players, motivated/dedicated to the industry.

Jaime M. Ragos

Top qualifications for seafarers are experiences in sea- and land-based jobs, behavioral competency, advanced educational attainment, rising from ranks as seafarers, and positions on board (at least Master/Chief Engineer).

The study also found that the top Philippine emerging maritime industries are manning, maritime training, ship management/technical consultancy, maritime review, and shipbuilding. Others are travel agency activities, cargo handling, service activities incidental to water transportation, industrial machinery and equipment installation, sea and coastal passenger water transport, off-shore industries (support activities for petroleum and natural gas extraction), and sea and coastal freight water transport.

The research project's final report also cited the Philippines as the manning capital of the world, ranking as the 32nd maritime country among the top 35 flags of registration, based on the United Nations Conference on Trade and Development Maritime Review in 2014. The country also remains as the top supplier of seafaring manpower in the world.

Challenges

However, Dr. Baylon found that while the Philippines has maintained its distinction as the manning capital of the world, there has been an obvious downtrend in the deployment of Filipino seafarers. This is due to the following factors: maritime administration/political system, competitive wage threats to Eastern European countries and Asian neighbors, decline in maritime education and training, and proliferation of fake training and competency certificates, among others.

Policy Recommendations

To effectively address these issues and concerns, the project recommends policy considerations on the development and/or implementation of the following:

1) Comprehensive information, research, and statistical data for Filipino seafarers
2) Appropriate feedback system (strong public-private partnership)
3) Reward system to performing MET institutions
4) Regular creation of a maritime strategic plan
5) Investment system to attract foreign investors
6) Competitive wage scale
7) New infrastructure, technology, equipment, business, or emerging industries, and
8) Welfare program and allied services beneficial to seafarers and their dependents.

Target Output

In support of the accomplishment of the Philippine Development Goals, the project came up with a manning productivity gain cycle which will help uplift the Philippine economy through human resources development, international competitiveness, macroeconomic sustainability, and sustained growth.

iAcademy studes bag top plum in digital game dev't contest

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

THREE DIGITAL learning games promoting and highlighting the contributions of Filipino scientists stood out in the final stage of Salinlahi Evolution, a game development competition held last December 3, 2015 at the Philippine Science Heritage Center (PSHC), at the Department of Science and Technology (DOST) compound in Bicutan, Taguig City.

These games were "Tuklas," created by Team Happy composed of graduating I.T. students from iAcademy and which won the grand prize; "Invention Rush," developed by team Code Eater of Polytechnic University of the Philippines (PUP) Taguig and which claimed the second prize; and "Arcadia" of team Multiple Error also from PUP-Taguig.

"Tuklas" is an educational game for kids, presenting players with simple yet engaging puzzles for them to learn, explore, and enjoy science at its basic form. For bagging the top prize, the iAcademy students received a cash prize of 50,000.00 and earned the chance for "Tuklas" to be featured at the PSHC.

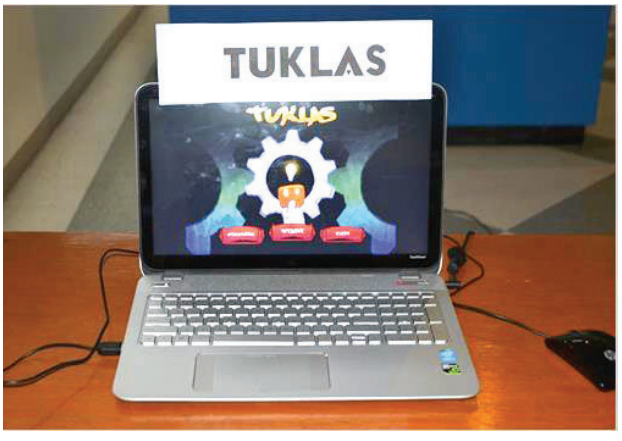
"Invention Rush" is a mobile game application which earned for team Code Eater a cash prize of 30,000.00 for copping second place.

DOST-NAST Executive Director Luningning E. Samarita-Domingo (left) awards a check in the amount of P50,000 to the grand winner of Salinlahi Evolution, Team Happy of iAcademy, who created the game "Tuklas," an educational game for kids. The members of Team Happy are (4th to 7th from left) Karl Rodriguez, Meris Soneja, Gian Legaspi, and Jhunel Dela. Also in photo are Liandro Antonio Tabora (2nd from left), Gauis Karl Noble (3rd from left),Jaderick Pabico (2nd from right) , and Roel Cantanda (extreme right), members of the board of judges.

Meanwhile, "Arcadia" is a two-dimensional android application featuring six mini-games. Team Multiple Error received 20,000.00 for claiming third prize.

A total of 50 entries were submitted after the competition was launched last year by DOST's National Academy of Science and Technology (NAST).

The top five teams were given the chance to pitch their products in front of the judges last December 3. The judges were Liandro Antonio Tabora, founder of Owlery eLearning Solutions; Gaius Karl Noble of DOST's Science Education Institute; Roel Cantada, assistant professor from the UP Open University; and Jaderick Pabico, professor at UP Los Baños.



A college student explores the game "Tuklas" during a visit to the Philippine Science Heritage Center. *(Text and photos by Allan Mauro V. Marfal, S&T Media Service, DOST-STII)*

"We are so glad that we won the top prize, despite having only three days to develop our entry product. But most importantly, we created a game that would help many Filipinos to learn more about the life of our scientists and their contributions in resolving various problems of our country," said Karl Rodriguez of "Team Happy." Rodriguez shared that after graduation, their group might build a startup company that will develop educational mobile games.

US Peace Corps volunteers hail STARBOOKS

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

In a photo-op with the DOST-STII staff led by Rosie R. Almocera, chief of STII's Information Resources and Analysis Division (seated, 3rd from right)

Members of the US Peace Corps sample the internationally acclaimed STARBOOKS during their visit at STII-DOST.

A GROUP of US Peace Corps volunteers who recently got a first-hand experience of the STARBOOKS praised the DOST's first and only "library in a box" in the country as a very good "S&T learning tool."

In a visit to the Science and Technology Information Institute (STII) of the Department of Science and Technology (DOST), Ji Yusi of the US Peace Corps said, "It was awesome! Very easy to use and when you log in, it's very easy to search with lots of videos and news, there's a lot of information that people can use."

A volunteer from Chengdu, China, Yusi said that she has never seen anything like the STARBOOKS, not in her hometown or in her country. "That is why we are here, we are learning from your experience," added Ji.

STARBOOKS, acronym for Science and Technology Academic Research-Based Openly Operated Kiosks, is an innovative product of STII aimed at bringing closer to communities with no or limited internet access a myriad of science and technology information gathered through the years by STII.

With the excitement already running high for the 11 visitors from the US Peace Corps, Louise Ian de los Reyes of the Information Resources and Analysis Division (IRAD) of STII gave the group a short backgrounder and updates on STARBOOKS. According to her, there are already 745 kiosks installed in different regions from Tuguegarao in the north to Davao in the south.

"STARBOOKS is a unique innovation that provides our students even in far flung areas access to science and technology information that they can use for research projects and to upgrade their personal knowledge on various subjects like Biology, Chemistry, Physics, Mathematics and other disciplines," said Rosie R. Almocera, chief of IRAD. She further challenged the group to come up with their own versions of the STARBOOKS so that the vast wealth of information on science and technology can be shared to as many people as possible.

After the briefing, the volunteers navigated the STARBOOKS on their own so they can actually experience how it works.

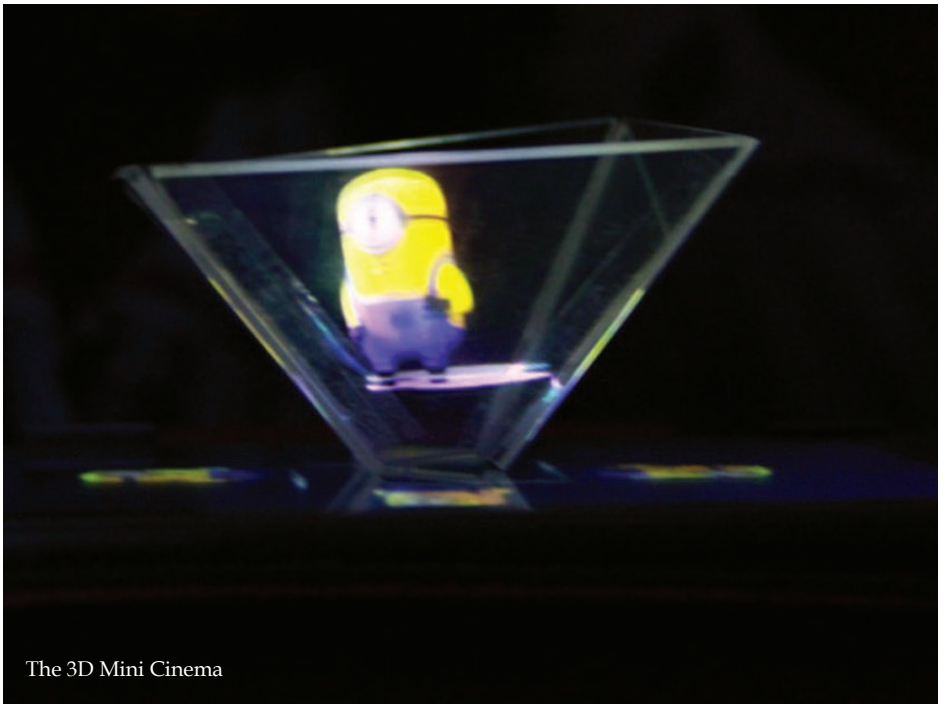
"You can see how advanced you are with STARBOOKS and how cutting-edge this is because in the U.S., internet is more prevalent. We don't see something like this that much and books are expensive," said Elizabeth Karr, Peace Corps Librarian.

Karr added that the database resources are very expensive and she commends the institute for bringing the information to communities which otherwise have no access to such materials.

At present, the US Peace Corps supports the development of the Philippines in three sectors, namely: environment, education and coastal resource management. Since 1961, some 8,000 volunteers from different countries have already served the Philippines in various capacities.

Painting with light at 2015 Science Film Festival

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



The 3D Mini Cinema

The students huddle around the design they created using mini-LED lights wrapped in Velcro strips and thrown onto a large Velcro pad. *(Photos by Ceajay N. Valerio, S&T Media Service, DOST-STII)*

The students are mesmerized by the lava lamp they created.

MORE THAN 100 students from three public high schools in Taguig City had a fun-filled learning experience during the kickoff ceremonies for the 2015 Science Film Festival held at the Philippine Science Heritage Center Auditorium, Department of Science and Technology (DOST) complex, Bicutan, Taguig last October 21.

The students learned about "painting" with light using camera tricks and the negative effects of too much artificial light to our environment in the two opening films of the Festival namely "The Light Elephant" and "Nine and a Half—Light Pollution."

Organized by the Goethe Institut in collaboration with DOST's Science Education Institute (SEI) and other partners, the event featured 44 international science films which were screened for free in schools, universities, and other educational centers from October to December 2015. The theme was "Light" which was in accordance with the United Nations' "International Year of Light" celebration.

After the film showing, the participants were grouped and made to perform hands-on experiments involving light. The activities included making a "mini 3D cinema" using clear CD plastic cases; creating their own lava lamps using common household materials; and making LED throwies.

The students' wows and ahs echoed in the room every time the lights were turned off as they marveled at their own creations.

"Thank you po sa Department of Science and Technology para sa kakaibang experience na ito. Sobrang na-enjoy ko po yung "The Light Elephant" at saka yung hologram (mini 3D cinema) po. Since reproducible po pwede po naming gawin with my school mates (Thanks to DOST for this unique experience. I really enjoyed watching "The Light Elephant" and making the hologram. Since the activities are reproducible, we can also do them with my schoolmates)," said Bea Suavengco, a student of Taguig Science High School.

Pisay studes shine in Malaysian Fair

By ARISTOTLE P. CARANDANG, Ph.D.

KUALA LUMPUR, Malaysia - Brilliant and eloquent – two fitting adjectives that best described students from seven campuses of the Philippine Science High School (PSHS) System or Pisay who represented the Philippines at the 2015 Kuala Lumpur Engineering and Science Fair (KLESF) from October 30 to November 1, 2015 in Kuala Lumpur, Malaysia.

The trio of Grade 8 and 9 students Teokan Duran Demircan, Joseph Karl Salva Jr., and Bryne Alric L. Yu from Pisay Central Visayas Campus in Argao, Cebu bested most of the entries as they received a silver medal for their project "Coconut Coir Based Sound Absorber Board for Noise Pollution Control". Receiving the bronze medal was the team from Pisay Ilocos Campus in San Ildefonso, Ilocos Sur composed of Grade 8 students Kharina Malaya Q. Lopez and Lhourd Jacyrone M. Fortus who won for their project "Effectivenes of Talahib (Saccharum spontaneum) Grass with Wood Waste Structural Board". Taking the gold was the entry from Malaysia.

Bryne Alric L. Yu from Pisay Central Visayas Campus in Cebu (4th from left) and his teammates bested most of the entries with their silver medal finish.

Pisay Ilocos Campus students Kharina Malaya Q. Lopez and Lhourd Jacyrone M. Fortus who bagged the bronze medal.

Joining the competition were about 130 schools mostly from Malaysia, Thailand, Cambodia, and the Philippines. Teacher-Advisers joining the winners were Benito A. Baje and Mary Ann R. Laurente from Cebu and Ilocos campuses, respectively.

Pisay students who joined the KLSEF were from the following campuses: Central Visayas (Argao, Cebu), Ilocos (San Ildefonso, Ilocos Sur), Central Luzon (Clark, Pampanga), Western Visayas Campus (Jaro, Iloilo), SOCCSKSARGEN (Koronadal City), Central Mindanao (Balo-I, Lanao Del Norte), and Main Campus (Diliman, Quezon City).

The PSHS system is a specialized public high school system under the Department of Science and Technology (DOST). It gives scholarships to Filipino students who excel in the sciences and mathematics. Admission to the PSHS is by competitive examination only and graduates of Pisay are bound to take pure and applied sciences, mathematics, or engineering courses. The system is known to have a very challenging curriculum which produces the best professionals in the country.

STARBOOKS wows KL

Joining as a non-competing exhibition was the Philippines' STARBOOKS or Science and Technology Academic and Research Based Openly Operated Kiosks, the country's first digital science library. It contains thousands of digitized science and technology resources in

STARBOOKS puts a smile on the face of this exhibit visitor.

various formats (text and video/audio) placed in specially designed "pods" set in a user-friendly interface. Visitors to the Philippine booth were impressed with the display as they were allowed to experience the system.

STARBOOKS is a standalone information kiosk making access to information (read only) even without Internet connection. It is a compendium of S&T information gathered from all over the world --- a one-stop S&T information source and features videos dubbed "Tamang DOSTkarte Livelihood Videos" to stimulate every Filipino's entrepreneurial capacity. Its added feature is the Encyclopedia Britannica 2013 edition.

The system was developed by the Science and Technology Information Institute (STII), the information arm of the DOST, aiming to create interest in the field of science and technology (S&T) which may increase the number of Filipinos enrolling in S&T courses; encourage great and curious minds to develop new ideas---inventions and innovations; and inspire one's capacity for entrepreneurship and research.

As of December 2015, STII has installed STARBOOKS in 783 sites all over the country and the number will surely increase as requests from all over continue to pour in. Initial installation was in 2011 with 11 sites in Davao and Zamboanga.

STARBOOKS is one of the government-initiated projects that has been hailed by the Commission on Audit (COA) as a truly laudable government project. In the COA final report of 2014, it said that the STARBOOKS was 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," shared Karlo Almonidovar, then COA 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."

On June 29, 2015, STARBOOKS was given the prestigious Presidential Citation by the American Library Association as one of the most innovative library projects in the world together with three others from Canada, Singapore, and Taiwan. The awarding ceremony was held at the International Librarians Reception, San Francisco Library, San Francisco, Californa, USA.

TO PAGE 81

Lopez and Fortus shown here while manning their exhibit booth.

Grace Christian wins 1st ever CanSat plum, Rizal NSHS regains water rocket title

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

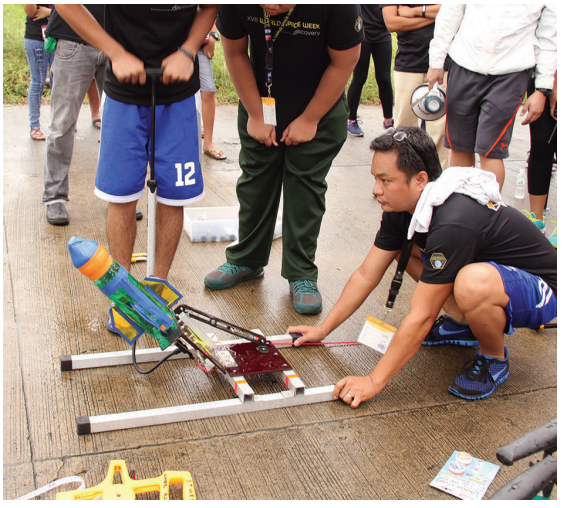
GRACE CHRISTIAN College made history as it was hailed as champion in the first ever Can Satellite Competition in the country held during the celebration of the 2015 World Space Week in Los Baños, Laguna.

Grace Christian College represented by Aaron Rian Choi, Lance Timothy Lim, and Filbert Heinrich Wee, and their coach, Simon Steven Tan, methodically designed their cansats and successfully gathered air pressure, temperature, and global positioning system data during the launch, earning them victory over 11 other participating schools. They also put a transceiver system to communicate data from the cansat to the ground station.

Its design also earned Grace Christian College the Best Systems Engineering Award. Overall, they received P 10,000 in cash prize and certificates.

A competing team places its cansat below hexacopter, which will launch the cansat 100 to 150 meters above ground to gather atmospheric data such as temperature, air pressure, and global positioning system, among others.

Placing second in the competition was Philippine Science High School – Main Campus while Makati Science High School won third. They received P 7,000 and P 5,000 cash prizes, respectively, including certificates.



Rizal National Science High School's water rocket landed nearest the target, which was 80 meters away from the launch area, to be hailed as champions and earned the right to represent the country in the APRSAF water rocket event in Bali, Indonesia.

"I congratulate the students who all exerted a high level of effort and time in making their cansats. I know it wasn't easy but I definitely saw how serious they were throughout the competition and that's what matters the most," said Dr. Rogel Mari Sese, focal person of the Philippine Space Science Education Program (PSSEP) of the Department of Science and Technology (DOST).

Meanwhile, Rizal National Science High School composed of Josh Rael Jorquia, Ralph Joshua Macarasig, Kaye Charity Ignacio and coach Marlon Sta. Catalina proved to be a veteran in the Water-boosted Rocket Competition as it launched its rocket 31 meters and 11 feet close to the target. With the win, they earned the right to represent the country in the annual Asia-Pacific Regional Space Agency Forum (APRSAF) water rocket event held last November 2015 in Bali, Indonesia.

"Space science is present in most of our used technologies today whether in disaster management, biotechnology, communications, and others," said DOST- Science Education Institute Director Dr. Josette Biyo. "Gaining interest in this field is crucial as we hope to establish a national space agency in the future."

Another highlight of the event was the lecture of DOST Balik Scientist Dr. Apollo Arquiza who talked about life inside the International Space Station. Arquiza, a former DOST-SEI Scholar, is known to have studied preparing food for astronauts in space missions.

Finally, 20 elementary students from public schools in Los Baños competed in the On-the-Spot Poster Making Contest done under the theme "Careers in Space". Among the contestants, Andre Ynigo Aquino of Los Baños Central Elementary School came out with the best poster to bring home a P3,000 cash prize. Finishing second and third place were Ray Emylson Flores of Mayondon Elementary School and Shantell Valerie Go of Lopez Elementary School, respectively. Their entries were also sent to the APRSAF to compete with 40 other countries.

Montejo banners DOST's

BUILD BACK BETTER PROGRAMS

in Top Leaders Forum 2015

Secretary Mario G. Montejo (middle) of the Department of Science and Technology (DOST) listens to Hans T. Sy, president of SM Prime Holdings Inc., as they discuss government initiatives in disaster risk reduction like DOST's Project NOAH. The dialogue was held during the Top Leaders Forum 2015 at the SMX Convention Center, SM Mall of Asia, Pasay City. Also in photo is DOST Assistant Secretary Raymund E. Liboro, co-founder of Project NOAH. *(Photo by Henry de Leon, S&T Media Service, DOST-STII)*

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

THE DEPARTMENT of Science and Technology (DOST) joined SM Prime Holdings Inc. and the United Nations Office for Disaster Risk Reduction (UNISDR) in the conduct of the Top Leaders Forum 2015 last November 10, 2015 at the SMX Convention Center at the Mall of Asia in Pasay City.

The forum is a yearly event that gathers top level leaders from both the public and private sectors to tackle issues on disaster risk reduction in order to implement tangible projects and initiatives that will result in reducing industry losses brought about by natural hazards.

During the forum proper, the UNISDR Private Sector Alliance for Disaster Resilient Societies (ARISE) in the Philippines was launched as a vehicle to provide opportunity for private organizations and the business sector to become members in a concerted effort in addressing the problems brought about by the changing weather patterns.

DOST Secretary Mario G. Montejo presented the different programs of the DOST in generating risk information and risk assessment in line with the agreements reached during the formulation of the Sendai Framework for Disaster Risk Reduction in March 2015.

"As our country is committed to the Sendai Framework for Disaster Risk Reduction, the DOST has implemented a number of disaster risk reduction programs like the Nationwide Operational Assessment of Hazards or Project NOAH and we integrated our LiDAR maps with our improved weather information to generate simulation models and come up with early warning systems for flood, storm surge and landslides," Montejo said.

It is projected that by 2030, there will be trillions of dollars in business investments across all sectors including those in hazard prone areas and so the need to assess and reduce risk becomes imperative for the private sector and disaster preparedness is no longer a choice but a must.

Montejo further said, "Science should be put to work to save lives as this is what President Aquino stressed in the aftermath of Typhoon Sendong and Project NOAH has since then provided us with a flood early warning system with a 6-hour lead time using advanced software technology, flood modeling and simulation and real-time data gathering from more than 1,500 sensors all over the country, all these developed by our own Filipino scientists and engineers."

Project NOAH is the flagship program of the DOST that provides a digital platform as repository of weather and hazard information that includes rainfall amount, typhoon track, water level monitoring system, flood, landslide and storm surge hazard maps. These hazard maps were produced using the light detection and ranging technology or LiDAR under the Disaster Risk and Exposure Assessment for Mitigation component under Project NOAH.

Montejo further stressed that aside from disaster preparedness, the DOST strategy also proved effective in coming up with more reliable, site-specific risk information for better land-use planning.

Also, by harnessing science and technology, Montejo said the DOST was able to identify safe and hazard areas using LiDAR technology and it was proven effective as the settlement areas identified were safe two years later, when typhoon Agaton hit the same areas and caused massive flooding.

SENTRY for water quality, solar-powered fish dryer to make life better for Batangueños

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

The catamaran-type buoy in Lipote River in Mataasnakahoy, Batangas.

THE CELEBRATION of the Department of Science and Technology (DOST) IV-A's 52nd anniversary in Mataasnakahoy, Batangas last November 20, 2015 was marked by the launching of two high-value technologies.

The first of these technologies is DOST's SENTRY or Sensing Environmental Parameters through Telemetry. Monitoring and assessment of water quality in Batangas Province has been given a boost with its launching.

SENTRY deploys devices for real-time automated data acquisition to help avoid fish kill and other adverse effects of poor water quality. These devices are sensors which come in the form of catamaran-type buoys. To be gathered are data on the water's acidity, turbidity, and total suspended solids or particles larger than two microns.

The first of these sensors, launched during the said occasion, is installed along Lipote River which had fallen prey to water pollution. The sensor will serve as a virtual round-the-clock sentry to stand guard over particles flowing from the upstream which will pollute the river.

These data will be transmitted, on a per hour basis, to a website which consolidates all other water quality information gathered from various monitoring agencies. Datalogging and communication technologies are provided by DOST's Advanced Science and Technology Institute.

Among others, SENTRY is also capable of warning concerned regulatory agencies if a particular data is nearing its critical level. It can also disseminate bulletins and advisories to local government units (LGUs), fish cage owners and other stakeholders.

SENTRY is an initiative of the regional offices of DOST, DENR, BFAR, and EMB, as well as Batangas State University which handled the design and fabrication of the buoys, Mataasnakahoy LGU, and Pusod, Inc. – an organization devoted to the protection and enhancement of ecosystems in the Philippines.

The other technology is DOST's solar-powered fish dryer for small fishermen within the Taal Lake Protected Area. Powered by eight solar panels and with a cabinet and tray made of stainless steel, the dryer is capable of drying 20 kilos of fish in six hours. It can accommodate "tawilis" and "biya" in particular from Batangas Province's lake. "Biya" specifically can be dried in just three hours. It is a staple food in the Taal Lake Protected Landscape which straddles Batangas and portion of Cavite Province.

The fish dryer is expected to improve product quality and production process, thus generating better livelihood opportunities for small fishermen. DOST IV-A will also provide training on Good Manufacturing Practices, packaging, labelling, and others.

The Kilusan ng Maliliit na Mangingisda sa Lawa ng Taal Mataasnakahoy chapter with 700 members, is the project beneficiary.

The project is a collaboration between DOST IV-A, Batangas State University whose mechanical engineering department designed the fish dryer, the local government unit of Mataasnakahoy, Pusod Inc., and Seacology Philippines – a non-profit environmental conservation organization.

The idea to develop a solar-powered fish dryer came about in the aftermath of typhoon Glenda in 2014 when small fishermen within the volcano and lakeshore areas encountered problems in drying their catch, thus adversely affecting supply and livelihood. (S&T Media Service)

Solar-powered fish dryer *(Photos by Gerardo G. Palad, S&T Media Service, DOST-STII)*

DOST Region II gets Philippine Quality Award

By VERONICA A. HERNANDEZ
Greenfields Magazine

THE DEPARTMENT of Science and Technology Region II in Cagayan Valley received the prestigious national Philippine Quality Award (PQA) Recognition for Commitment to Quality Management (Level 1) during the conferment ceremonies of the 17th Philippine Quality Awards at Malacañang Palace on September 22, 2015.

Assistant Secretary Dr. Urdujah A. Tejada with DOST-II Officer-in Charge Engr. Sancho A. Mabborang received the PQA Trophy from President Benigno S. Aquino III. Dr. Tejada was the incumbent DOST-II Regional Director during the PQA application.

"We are recognizing your pursuit of quality in the most profound sense of the word—because it does not only mean a stronger institution, a larger share in the market, or a higher quality of performance, but an infinitely higher quality of life for more Filipinos," President Aquino said in his keynote speech.

The Philippine Quality Award is the country's highest level of recognition given to government and private organizations for performance excellence equivalent to the very prestigious Malcolm Baldrige National Quality Program of the Unite States. The PQA focuses on seven criteria categories: (1) leadership (2) strategic planning (3) customer focus (4) measurement, analysis, knowledge management (5) workforce focus (6) process management and (7) results.

The DOST office in Cagayan Valley is the first national government agency in Region II accorded with the PQA award and the only government sector awardee in the 17th PQA Cycle. Other Level 1 awardees were the Colegio de San Juan de Letran-Manila and the Lyceum of the Philippines-Laguna.

(Photos by the Malacañang Photo Bureau.)

DOST-II PQA Team – (back, from left): Engr. Marcelo G. Miguel, provincial director of DOST's Provincial Science and Technology Center (PSTC)-Isabela; Engr. Jonathan R. Nuestro, provicial director of PSTC Nueva Vizcaya; Engr. Sancho A. Mabborang, OIC of the Office of the Regional Director; and Lucio G. Calimag, OIC of PSTC Quirino. (front, from left): Jessamyn B. Jadulos, center manager for training; Nora T. Garcia, provincial director of PSTC-Batanes; Mary Ann P. Maglasin, assistant regional director of Finance and Administrative Support Services; Virginia G. Bilgera, center manager for SETUP; Dr. Urdujah A. Tejada, assistant secretary and program manager for Countryside Development; Victoria B. Mabborang, planning officer; Dr. Teresita A. Tabaog, provincial director of PSTC-Cagayan; and Engr. Sylvia T. Lacambra, center manager for Regional Standards and Testing Laboratory.

Meanwhile, Level 2 awardees were SMC Yamamura Fuso Molds Corporation, ROHM Electronics Philippines, Inc., and STMicroelectronics Inc.

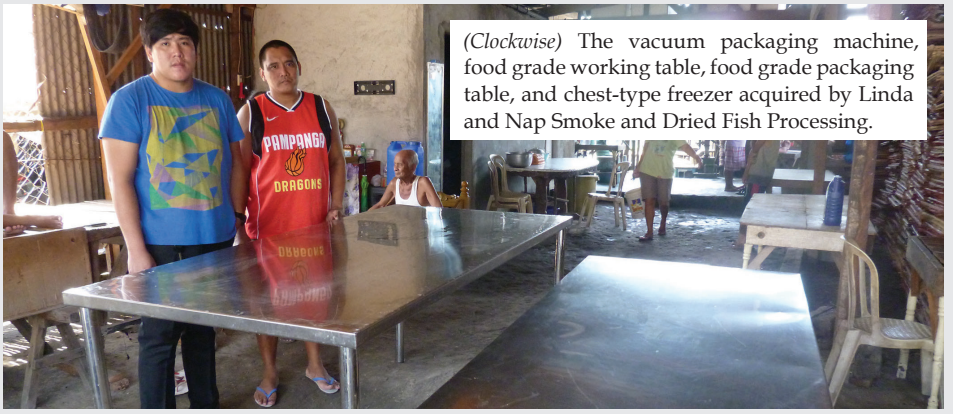
"DOST-II's relentless efforts to achieve (excellent) organizational performance (lies) on believing in the human capital, placing the highest importance to its workforce, (and) enhancing their learning skills in order to provide quality service to its customers," according to DOST-II's statement.

"Also, the reason behind DOST-II's successes is along the lines 'We are a platoon, but we work like a battalion.' And as a team, whatever success is celebrated, valuing contributions done by everyone, living by the tagline 'Working Together, Sharing Together, Celebrating Together,'" the statement also said.

DOST-II started working on attaining PQA with the creation of its Performance Excellence Team, putting in place the ISO 9001 Quality Management and the ISO/IEC 17025:2005 of its Chemical and Microbiological and Metrology testing laboratories. Apart from the ISO/IEC 17025:2005, the DOST-II laboratories also pursued other certifications and accreditation from regulatory bodies like the Department of Environment and Natural Resources-Environmental Management Bureau; Department of Health-Food and Drug Administration; and the Department of Health.

P1.4M worth of technologies for Bataan firms

By JERWIN R. VIANZON
PSTC-Bataan, *DOST III*



(Clockwise) The vacuum packaging machine, food grade working table, food grade packaging table, and chest-type freezer acquired by Linda and Nap Smoke and Dried Fish Processing.

AIMING TO improve productivity, product quality and waste management of four Bataan firms, the Department of Science and Technology (DOST) III recently provided them with machines with a total value of P1.4M thru the agency's Small Enterprise Technology Upgrading (SETUP) Program.

"Because of the new dough sheeter machine, we make the crust faster," shared firm-owner Ester T. Domingo. The semi-automated equipment decreases their operation time dramatically because they no longer manually produce pie crusts using rolling pin.

The manager of Sam Roque's Food Products in Samal shares the same experience.

Acquiring a planetary mixer, a band sealer, and a food grade working table, Sam Roque's Food Products in Brgy. San Roque, Samal, Bataan eyes improvement in their production practices. The planetary mixer will mechanize the preparation of dough which they manually and laboriously produced before, while the band sealer assures them that the crispness of their products will last long since the packaging materials are properly and tightly sealed.

Product quality is also the major concern of Linda & Nap Smoke & Dried Fish Processing in Brgy. Pto. Rivas-Ibaba, City of Balanga, Bataan. This 40-year-old company that processes assorted fish into "tuyo" or dried fish and "tinapa" or smoked fish wanted to improve the packaging and the shelf life of its products

Thus, DOST assisted them to acquire vacuum packaging machine. To complement it, the project necessitated a chest type freezer where the vacuum packed processed fish will be cold stored prior to delivery. The firm also acquired two units of food grade working tables to improve their food safety practices.

Being a piggery farm, Robles Farm in Brgy. Laon, Abucay, Bataan, is concerned with the proper waste disposal and management. Thus, the firm sought the assistance of DOST to adopt the agency's biogas digester technology and to install 117 cu. m. biogas digester with 58.5 cu. m. gas capacity.

Biogas digester converts farm waste into biogas including methane. It also minimizes the release of harmful greenhouse gases produced from the decomposition of farm wastes.

Dough sheeter acquired by Montey's Food Products

The band sealer acquired by Sam Roque's Food Products

Seminars aim to prop craft and furniture industry in Negros Oriental

By SEAN ADRIAN T. GUARDIANO
S&T Media Service, *DOST PSTC Negros Oriental*

Engr. Edilbert M. de la Peña, an MIRDC expert receives the Certificate of Appreciation from DOST NegOr PSTC Training Coordinator Rommel L. Romagos

THE DEPARTMENT of Science and Technology -Negros Oriental Provincial S&T Center (DOST NegOr PSTC), in cooperation with Foundation University, concluded a two-day, four-part materials innovation seminar series for selected homegrown designers and representatives of some micro, small, and medium enterprises (MSMEs) on November 12-13, 2015 in Dumaguete City, Negros Oriental.

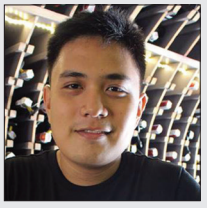
"The seminar series is aimed at equipping local designers with some technical knowledge on various types and properties of materials so that their designs become more suitable to specific types of materials," said DOST NegOr PSTC Director Gilbert R. Arbon, adding that the activity hopes to create a pool of local industrial designers to support the province's craft and furniture industry.

Five experts on materials innovation from the different DOST Research and Development Institutes (RDIs) came to share their knowledge and expertise, representing the following agencies: Philippine Textile Research Institute (PTRI), Forest Products Research and Development Institute (FPRDI), Metals Industry Research and Development Institute (MIRDC) and Industrial Technology Development Institute (ITDI).

Engr. Adela H. Montalvo of PTRI discussed natural and synthetic fibers as materials for craft industries. Josefina R. Celorico, an expert from ITDI explained the use of plastic, ceramics and fiberglass as essential materials for the craft industry, while Engr. Edilbert M. de la Peña of MIRDC talked about metals and related resources. Foresters Robert A. Natividad and Moreno L. Santander of FPRDI lectured on wood, bamboo and other forest products.

"We ensure the global competitiveness of environment-friendly forest-based products and enhance the efficiency and effectiveness of existing forest-based industries and assist in the establishment of new enterprises," said Natividad..

Most of the participants came from the MSME sector, which included manufacturers of furniture, gifts and decors, handicrafts, and fashion accessories. Potential product designers also attended the two-day activity.



Sean Adrian T. Guardiano

Marinduqueños enjoy the benefits of S&T

By BERNARDO T. CARINGAL & ELEAZAR P. MANAOG
S&T Media Service, *DOST-MIMAROPA*

Mr. Marcelino Landig and Mrs. Hilda Hirondo (3rd and 2nd from right, respectively) of Mogpog Vegetable Growers Association receives the cheque for the project on dehydrated buko and coconut candy production from (from left to right) PSTC-Marinduque PSTD Bernardo T. Caringal, MSC President Dr. Merian Mani, Marinduque Gov. Carmencita O. Reyes, and DOST-MIMAROPA Regional Director Dr. Ma. Josefina P. Abilay.

DOST-MIMAROPA, THROUGH the Provincial Science and Technology Center (PSTC)– Marinduque, conducted a ceremonial awarding of technological assistance to the DOST Small Enterprise Technology Upgrading Program (SETUP) and community-based assisted clients, and a launching of DOST-developed technologies, which are adopted or soon to be deployed in the province at the Marinduque State College, Boac, Marinduque last December 3, 2015.

The activity aims to promote the agency's programs and services that enables our MSMEs to develop and produce competitive products through innovative, cost-effective and appropriate technologies and aid regional economic growth.

SETUP released a total of PhP 3.8M in 2015 for the eight (8) MSMEs, namely: Roby's Bakeshoppe, Dy's Bakery, Rey's Bakeshop, SMJ Welding Shop, Brilliant Juice Manufacturer, Doughboy's Café and Bakeshop, Moriones, Baker's Shoppe, and Putitas Puto Cakes and Café.

Meanwhile, a total of PhP 930,000.00 worth of community-based projects for the Baliis Farmers Community Association (buntal fiber processing in the municipality of Sta. Cruz), Batayang Pamayang Kristiyano–Buenavista Chapter (VCO and coconut concentrate production), the Municipality of Boac (Kiln Drying Facility), and the Mogpog Vegetable Growers Association (dehydrated buko and coco candy production) was released through the Grants-in-Aid Program.

SETUP assistance provides firms and communities with appropriate and innovative technologies in order to upgrade production facilities to industry standards, which will consequently increase productivity. As of December 2015, the DOST-MIMAROPA, through the PSTCMarinduque, has assisted a total of 39 firms under SETUP assistance, and 22 community-based projects under Local GIA program in the province.

Another highlight of the ceremonial awarding is the turn-over and launching of the DOST-ITDI's

Ceramic Water Filter technology for the Marinduque Barangay Health Workers Cooperative. Science and Technology Academic Resource-Based Openly-Operated Kiosk Stations (STARBOOKS) for the four campuses of the Marinduque State College (MSC), and the RxBox, powered by Solar Home System for the Rural Health

MSC President Dr. Merian Mani gives a thumb-up for DOST's STARBOOKS.

Provincial Administrator Baron Lagran tries out the RxBox, which is powered by Solar Home System.

Units in the province were also launched during the event.

DOST-MIMAROPA and DOH CHD-4B collaborated for the establishment of facilities for the production of the Ceramic Water Filter. These facilities will allow Marinduque communities to have improved access to potable water and reduced incidence of water-borne diseases.

Technology training for this purpose was already conducted, and full operations are expected to commence by the first quarter of 2016.

In an attempt to enhance the library services for students around the province, DOSTMIMAROPA piloted the adoption of STARBOOKS at the MSC Library. STARBOOKS is the Philippines' first Science Digital Library where anyone, especially students, can browse and access a wide range of S&T-related information—with pictures, presentations and videos—as well as livelihood trainings.

Another exciting project is the adoption of Solar Home System for the RxBox, a technology that is an ICT (Information and Communications Technology) innovation designed to support the Department of Health's call for Kalusugang Pangkalahatan or Universal Health Care.

The RxBox features blood pressure monitoring, pulse oximeter, electrocardiogram (ECG), fetal health monitor, maternal tocometer, and temperature sensor. PSTC-Marinduque provided an innovation to the program with the use of the Solar Home System to provided uninterrupted power supply to the unit.

Prior to the ceremonial awarding and launching of projects, DOST-MIMAROPA, headed by Regional Director Dr. Ma. Josefina P. Abilay, conducted visits to selected DOST-assisted projects in the province.

DOST-MIMAROPA Director Abilay (rightmost) shares a laugh with the owner of Doughboy's Café and Bakeshop, a SETUP-assisted project, in Boac, Marinduque during the project visit.

Bernardo T. Caringal

Eleazar P. Manaog

OrMin, Romblon folks learn more about home-based job options

By RANJIT G. MONTABLAN, MAE ANGELICA FABITO & CYD FRANCIS D. RECIDORO
S&T Media Service, *DOST-MIMAROPA*

THE DEPARTMENT of Science and Technology-Information and Communications Technology Office (DOST-ICT Office) and DOST-MIMAROPA, in cooperation with the Provincial Governments of Oriental Mindoro and Romblon, conducted Rural Impact Sourcing (RIS) workshops in Calapan City, Oriental Mindoro, and in the municipality of Odiongan, Romblon, on November 25 and December 8, respectively.

The RIS workshops, in a nutshell, were about bringing and introducing online, home-based job opportunities in the countryside. According to Assistant Secretary Monchito Ibrahim of the DOST-ICT Office, it is one of the four sub-programs of the DOST-ICT Office's DigitalPH Program, which aims to transition the Philippine economy into a digital economy by promoting ICT-enabled economic opportunities, not just in Metro Manila, but also in the provinces. The RIS, according the DOST-ICT Office website (http://icto.dost.gov.ph), "is considered as outsourcing, which focuses on providing meaningful jobs and other related opportunities in socio-economically disadvantaged areas… where there is high population but low employment due to lack of investors." Ultimately, it is one of DOST's initiatives to realize its thrust for the Philippines to be "a global leader in Information Technology-Business Process Management (IT-BPM) Services generating direct employment of 1.3M" with 520,000 of those coming from rural areas.

DOST-MIMAROPA Regional Director Dr. Ma. Josefina P. Abilay, on the other hand, said that with the opportunities accorded by online jobs, "unemployment would be an imaginary foe". She also emphasized that e-Marketing has grown in scale and has generated millions of home-based jobs across six continents. Furthermore, the micro-work of e-Marketing has spun-off to social media content posting and advertising management, e-mail marketing, search engine optimization, and the like, creating windows of opportunities for non-tech people to work in digital marketing campaigns.

The RIS workshops featured resource speakers from Freelancer.com and OnlineJobsUniversity.com, as well as testimonials from locals who have been online jobs professionals for some time. Workshop participants were composed of college students, members of the academe, professionals, and government employees. Among the key topics discussed were how much one can typically earn doing online jobs; the pros and cons of doing online jobs; the different types of online jobs; how to deal with clients; the general tools, equipment and applications one should master; legitimate online platforms where to find legitimate online jobs; and how and where to receive payments.

Ranjit G. Montalban

Mae Amgelica Fabito

Cyd Francis Recidoro

DOST official, scientist among 2015 outstanding public officials and employees

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

A FORESTER from the Department of Science and Technology (DOST) and the director of DOST-Region X's Provincial Science and Technology Center (PSTC) in Bukidnon are among the awardees of this year's Outstanding Public Officials and Employees Awards of the Civil Service Commission (CSC).

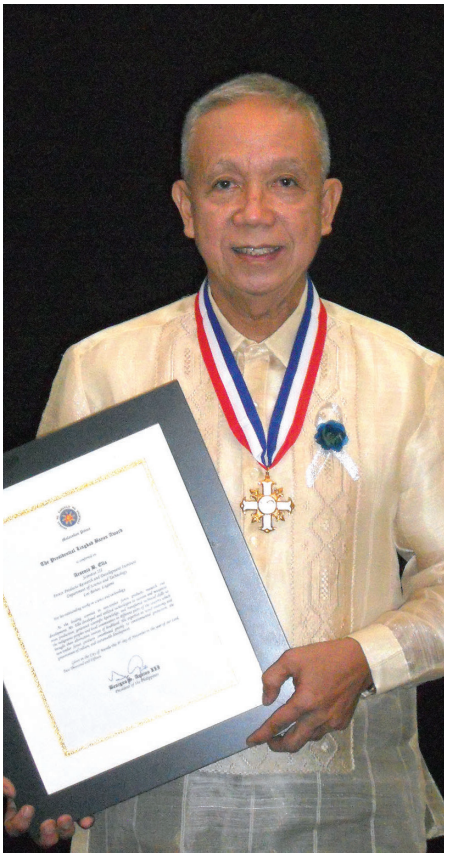
Forester Arsenio B. Ella from DOST's Forest Products Research and Development Institute (FPRDI) received the Presidential Lingkod Bayan Award for "sharing his knowledge on science and technology to the community to assist them with their livelihood."

On the other hand, Senior Science Research Specialist Virgilio M. Fuertes, director of DOST Region X's PSTC, was conferred the CSC Pagasa Award for "his scientific and extensive research to improve the products of the small businesses in Bukidnon."

A renowned wood anatomist, Ella spent much of this 43 years in government service developing scientific methods of harvesting resin from forest trees. This involves making a cut in the tree in order to collect a particular substance for various purposes. Among these trees are almaciga, pili, apitong, palosapis, and Benguet pine, among others, from which resin is captured without harming the tree.

His love for the indigenous people (IP) served as his motivation in introducing and promoting his method of tapping resin, providing sustainable livelihoods to IPs in different parts of the country, with the harvesting of resins being a good source of income. Among the IPs he has helped are the Bontocs, Isnegs, Mangyans, Dumagats, Aetas, Tagbanuas, Palau-ans, Bataks, Mandayas and Manobos.

Almaciga resin, or Manila Copal, is used in the manufacture of paints, varnishes, printing ink, shoe polish, floor wax, and others.



Forester Arsenio B. Ella

Director Virgilio M. Fuertes

"Most of our awardees are unknown to the public," said Pres. Benigno S. Aquino in his speech during awarding rites last November 9, 2015 at Rizal Hall of Malacañang Palace. "They are just working quietly. Although no one can see what they are working on, they are still doing their job passionately and correctly. So let us take this opportunity to recognize them and make their noble deeds known."

The Presidential Lingkod Bayan Award is given to an individual or group for extraordinary contributions resulting from an idea or performance with nationwide impact on public interest, security, and patrimony.

On the other hand, the CSC Pagasa Award is handed out to an individual or group for an outstanding contribution resulting from an idea or performance which directly benefited more than one department of the government.

Ella and Fuertes received a gold-gilded medallion crafted by the Bangko Sentral ng Pilipinas and a presidential plaque. In addition, Ella and other Lingkod Bayan awardees received a cash prize of P200,000 while Fuertes and his fellow CSC Pagasa awardees received a cash prize of P100,000.

The Outstanding Public Officials and Employees Awards is an annual nationwide search for the country's outstanding public servants conducted by CSC, as part of their Honor Awards Program. It aims to motivate and inspire civil servants to improve the quality of their performance and encourage profound involvement in public service.

Leading NRCP's drive to excellence

She may not have achieved what she originally aspired for, but Dr. Carina G. Lao led a successful career nonetheless. The former executive director of the National Research Council of the Philippines spent the last 40 years working in the field of science. Maria Luisa S. Lumioan takes us through this remarkable career path.

SCIENCE WAS actually far from her mind when she graduated with a degree in Bachelor of Science in Business Administration in 1974.

"Ang gusto ko noon sales, advertising. Hindi ko alam na mag-la-land ako sa PAGASA (I wanted to pursue a career in sales or advertising. That's what I wanted. I had no idea that I would land in PAGASA)," revealed Dr. Carina G. Lao.

Her former classmate from high school who was then working in PAGASA prodded her to apply in the agency. It was her first job. "All the while akala ko, sandali lang ako dun. Pero naibigan ko na rin." (All the while, I thought it would be just temporary. But I learned to love the work). She eventually stayed on in PAGASA for 39 years.

For the first two years, she was a contractual under the Typhoon Research Project of PAGASA—first as a weather observation aide, then as a weather observer after completing the Meteorological Observers Training Course.

Later on, she delved into computer programming, starting out as an input machine operator. "Malalaki pa ang computer nun (computers then were really big)," she recalled. "Ang naging better half ko ang nagturo sa akin ng programming (the one who taught me programming eventually became my husband)," she narrated.

From 1981 until 1982, she underwent an intensive Meteorologist Training Course. She eventually earned her Master's and Doctoral Degree in Meteorology from the University of the Philippines through PAGASA and DOST scholarships respectively. As well, she underwent a lot of trainings here and abroad to further hone her expertise in meteorology.

Through hard work and dedication, she rose from the ranks and was eventually assigned to head the research and development (R&D) unit then. As head, one of the first things she did was make sure that everybody in PAGASA knew what his or her unit was doing.

"Kasi ang research, two to three years bago makita ang resulta (It takes two to three years before the outputs of researches can be seen)," explained Dr. Lao. For this reason, the R&D staff usually did not get awards given out by the office at the end of the year.

She took the situation as a challenge. "Lahat ng activities namin sa field station at mga researches namin, pati yung mga ginagawa naming nagsusukat ng storm surge, kinunan ko lahat ng picture yun at pinost namin sa bulletin board ng R&D. (I took photos of all our activities at the field station, our researches including our staff measuring storm surges, and then I posted these photos in our bulletin board for R&D)," narrated Dr. Lao. From then on, awards started coming their way.

Later on, she was also assigned to head the training unit of PAGASA which not only trains local meteorologists, but foreign ones as well. She instituted stricter procedures in enlisting local trainees specifically for meteorology and hydrology by requiring potential trainees to take qualifying exams for which she herself prepared the questions. Likewise, Dr. Lao took great lengths to ensure that the test would not leak; up to the point that she took care of photocopying the test papers herself and sealing them before sending them to the fields/regions.

"Gusto naming itaas ang kalidad eh," she explained, "kaya kailangan natin yung tama (We wanted to raise the quality [of PAGASA] so we must do it right)."

Working in NRCP

While still working in PAGASA, she became a regular member of the NRCP under its earth and space sciences division, in 1995. From 2004 to 2009, she served as division chair and was also a member of NRCP's governing board. That time, she began entertaining the thought of serving NRCP more, though she did not know when or how.

In December 2013, this aspiration was fulfilled when she was chosen as NRCP's new

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Dr. Marieta Bañez Sumagaysay: Taking the Reins at NRCP

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

ON THE day of the interview, merely a month and a week had passed since Dr. Marieta Bañez Sumagaysay assumed the post of Executive Director for the National Research Council of the Philippines (NRCP) on November 9, 2015. Right away, she buckled down to work and started learning everything there is to learn about the Council.

"The timing is such that I don't really have that space even to look at my room and put some plants, flowers, things," she related, waving her arm around her office room to stress her point. "My glass and my cup, I only bought last week, because I don't have time. There was the budget hearing, the planning, the 82nd anniversary of NRCP."

She is happy with what she sees though. "Everybody's working. There are a lot of ideas around, I see it. My challenge is to catch up with them, give the directions," she admitted, "otherwise, the energies will be lost."

Photos by Henry De Leon
S&T Media Service, DOST-STII

Bundle of energy

The woman who has to do the catching up is herself full of energy.

She is a member of 11 professional/civic organizations including NRCP of which she has been a member for more than 10 years. In fact, she is the current vice-president of NRCP-Visayas Regional Cluster. She is also the president of the National Network on Women in Fisheries of the Philippines and secretary of the Women's Studies Association of the Philippines.

Her brilliant career includes 34 years of teaching experience, specifically as Economics Professor 9 at UP Visayas Tacloban College where she later became Dean from 2000-2006 – a remarkable record for somebody who initially shunned economics and the world of teaching and instead wanted to become an accountant.

Dr. Sumagaysay likewise held various other administrative positions at this time – as division chair, coordinator for the research office and the alumni office. Later, she also served as director of the Leyte Samar Heritage Center in UP Tacloban.

Also under her belt are several years of active involvement in research work. Dr. Sumagaysay has published several research findings, read papers in national and international conferences, and managed numerous researches

Lately, her research has been focused on gender, women, and labor force participation especially in coastal and fishing communities. In particular, she has done research on women in seaweed farming, rice farming, fishing, and other small-scale enterprises.

She revealed to S&T Post that she targets to continue her self-imposed goal of conducting at least one research a year and traveling abroad to read a paper at least once a year as well – targets which she has been meeting consistently.

So what is it about research that she enjoys?

It's the interaction with different people that gives her fulfilment. "I'm a social scientist so I love to go to the barangays. I love to talk to people," she shared. "When they smile and tell you thank you, I really feel it's true."

Steering the ship in its course

It is exactly this experience of teaching and mingling with different kinds of people that is put to good use in order to search for new knowledge which will help her steer the Council into the right direction, said Dr. Sumagaysay whose style of administration is collegial and participatory.

She said the question 'What else can NRCP do to fulfil its mandate?' pops up frequently. "As a teacher you always ask that, 'what else can I teach and share to my students?,'" she said.

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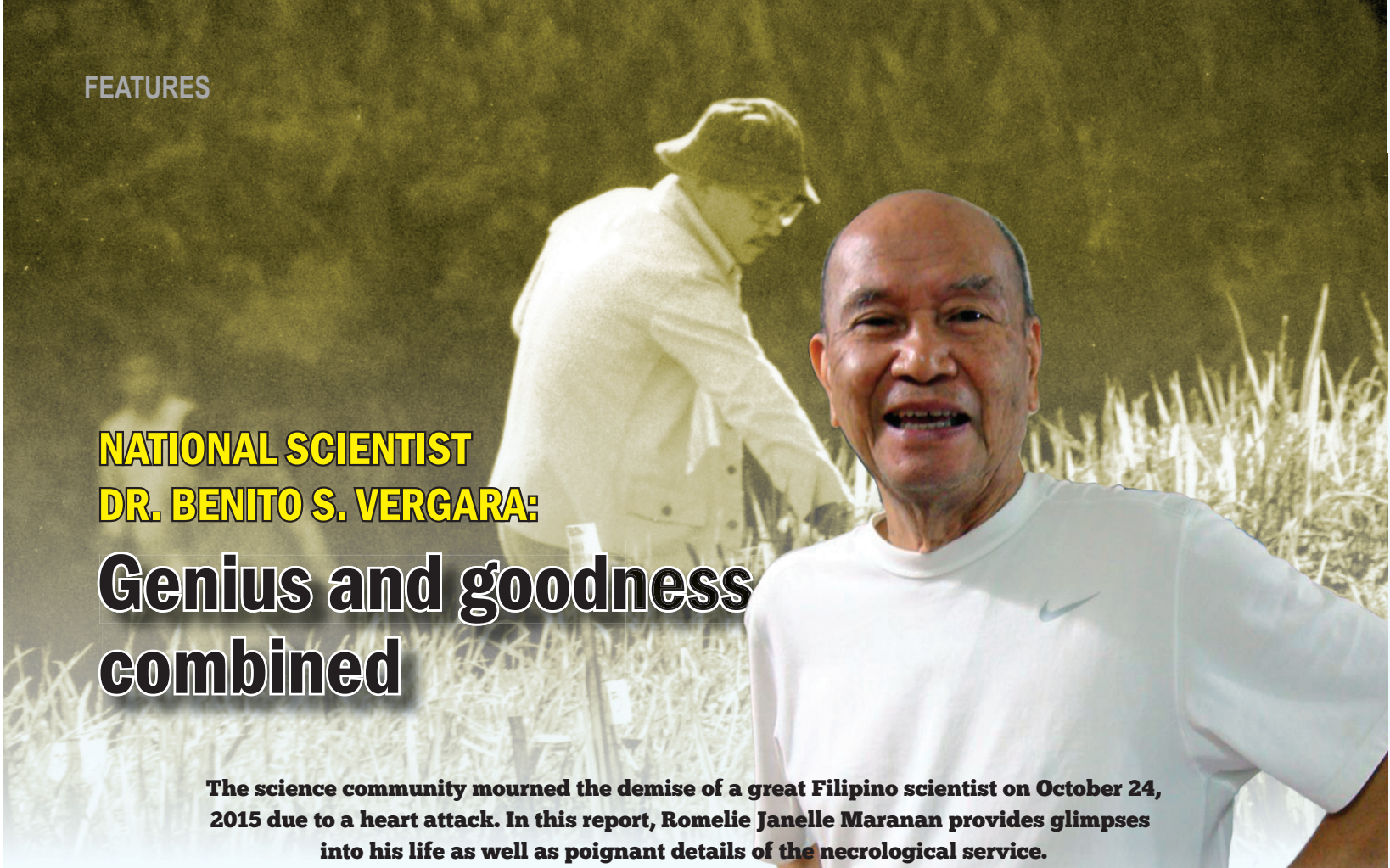


NATIONAL SCIENTIST DR. BENITO S. VERGARA:

Genius and goodness combined

The science community mourned the demise of a great Filipino scientist on October 24, 2015 due to a heart attack. In this report, Romelie Janelle Maranan provides glimpses into his life as well as poignant details of the necrological service.

National Scientist Dr. Benito S. Vergara, 81, was remembered by his loving family, friends, colleagues, fellow Academicians and National Scientists, and the rest of the science community during the necrological service held in his honor at the Department of Science and Technology (DOST) in Bicutan, Taguig City five days later on October 29.

A vigil guard hands over the Philippine Flag to Lina Manalo-Vergara, wife of Dr. Vergara.

In their eulogy, National Academy of Science and Technology Philippines (NAST Phl) President Academician William G. Padolina and Academician Ruben L. Villareal, chair of NAST Phl's agricultural sciences division, recognized Vergara's significant role in the science sector, specifically in agriculture.

Meanwhile, DOST Secretary Mario G. Montejo noted that the whole science community will always remember and honor his achievements, most especially his passion in making Aling Maria and Mang Juan feel the impact of science and technology in their lives, which DOST dubs as "Agham na Ramdam."

In particular, the man behind the development of the Riceworld Museum and the Philippine Heritage Center in NAST Phl was recognized for his exceptional contributions to scientific knowledge on plant physiology and for promoting Philippine science locally and internationally. His fascination with plants led to his decision to pursue agriculture.

He obtained his BS Botany degree from UP Diliman in 1955, MS Botany from the University of Hawaii in 1959, and PhD in Plant Physiology from the University of Chicago in 1960. Afterwards, he worked as an assistant professor at UP Los Baños in 1961. This was followed by a long stint at the then newly launched International Rice Research Institute (IRRI) as associate plant physiologist in 1969, and then as plant physiologist in 1970 and finally, as head plant physiologist in 1984.

At IRRI, the National Scientist focused on three major research areas: the flowering response of rice to photoperiodism (the plant's ability to flower in response to seasonal changes), rice physiology, and deep-water rice. He then worked on the physiology of deep-water rice and flood-tolerant rice plant and developed techniques and methods for the development of rice growing. His methods were later adopted by national breeding programs and other rice-growing countries.

Vergara was also behind the conceptualization of a model for the super rice for higher rice yield.

In addition, his group pioneered research on the possible effects of ozone depletion in the atmosphere on the growth, development and yield of rice.

His passion in promoting science to the public gave way to the publication of his book Farmer's Primer on Growing Rice, published in more than 50 languages and used around the world. In addition, he also published a plant catalogue and a children's literature about rice plant.

For his achievements, Vergara was elected as Academician to the NAST Phl in 1987 and was conferred the title National Scientist in 2001, the highest award accorded to Filipino scientists.

Department of Science and Technology Secretary Mario G. Montejo comforts the bereaved wife of Dr. Vergara.

His colleagues however recalled that despite all his feats, he remained kind, humble and generous.

"While many recall Dr. Vergara's lessons about the value of patience, the importance of education, knowledge and skills in science, and of seeing and keeping in mind the good, our family remembers him as a good father," his firstborn son Benito "Sunny" Vergara Jr. said in his eulogy.

"For the past few days, we have been hearing a lot about how my father was a man of many accomplishments, an icon, and an extraordinary man. And I, too, thought that he was an extraordinary man," Sunny continued. "He taught me how to love, he taught me how to have confidence in myself, he taught me how to be a father to my daughter, and he taught me how to be a good husband to my wife."

National Academy of Science and Technology President Academician William Padolina, a close family friend of the Vergaras, offers a prayer to the late National Scientist by playing a doxology with his violin.

Even after retiring, Vergara continued to serve tirelessly. He served the church, started scholarships, mentored aspiring scientists, among others. He received numerous awards, not only for his outstanding scientific achievements, but also for being a good man. One of these was as "Outstanding Citizen of Los Baños" given in 2004.

Until his last days, his love for the land remained, primarily evident in his beautiful and bountiful gardens. As written by UP Mass Communications Professor Dr. Clarissa C. David in a feature article on Vergara published in the International Journal of Philippine Science and Technology in April 2015, he was truly "a man at home among the plants and leaves and flowers that he loves."

Dr. Benito S. Vergara is survived by his wife Lina Manalo-Vergara who was IRRI's first head librarian, sons Sunny and Happy, daughter Joy, and four grandchildren.

"We must tell ourselves that he is not gone," Sunny said in his eulogy. "He lives in the lives of the many students that he mentored, he lives as he has touched the lives of the people that he helped, he lives in the dreams of scholars and young scientists that he inspired and will continue to inspire, and he will always live in our hearts."

Academician Padolina fittingly summed it up in his eulogy, "His life is truly a life lived well."

National Scientist Dr. Benito S. Vergara was interred at the Libingan ng mga Bayani in Taguig City.

Photos by Ceajay N. Valerio
S&T Media Service, DOST-STII

National Scientist Benito S. Vergara's burial at Libingan ng mga Bayani in Taguig City.

Community consultation in Sitio Tapayen, Tineg, Abra

Benchmarking the CEST Project of Tineg, Abra

By SHIELA MARIE SINGA-CLAVER
S&T Media Service, *DOST-CAR*

On October 19, 2014, a team from the DOST-CAR regional office and the PSTC-Abra headed by PSTD Menandro B. Buenafe traveled to Tineg in Abra. Shiela Marie Singa-Claver shares her experience with the team in this story.

One of the hardest municipalities to reach due to very poor road conditions (the roads are passable only during the dry season), Tineg is composed of the different sub-tribes of the Tingguian, the Indigenous People (IP) group of the province.

The DOST-CAR and PSTC-Abra group journeyed to the place to conduct benchmark activities since the municipality was identified by the agency as the Community Empowerment through Science and Technology (CEST) recipient for 2014.

The CEST program aims to provide S&T assistance to the poorest of the poor municipalities in the country through five entry points namely: (1) livelihood (2) basic education (3) disaster risk reduction management (4) health and nutrition, and (5) water and sanitation.

It was around 5:30 am when our team, together with the LGU Tineg staff headed by Rodolfo Canam, MPDO took the 2-hour drive from the capital town of Bangued to Vira, Tineg. From Vira, we proceeded to Sitio Tapayen, Alaoa by foot to validate a proposed project site.

Standing in front of impoverished communities and presenting government programs is very difficult. While we outlined

the DOST CEST program, we were met with expectant faces, hopeful residents waiting for government programs that could ease their hand to mouth existence and provide alternative livelihood opportunities that would make life a bit easier.

As is customary in small towns in the Cordillera region, this small community of Tapayen, through the LGU Tineg, provided lunch for their visitors; visitors, as one elder-leader in the community said, "who will bring projects to help us."

That made me even more determined to do everything in my power to ensure that the CEST project will succeed.

Our brief stay in Tapayen has reinforced the cultural diversity of the Cordillera Region. Belonging to the Ibaloi-Kankana-ey group of Benguet, I saw for myself how, although we belong to one region, the culture of the IPs is distinct and what works for the IPs of Benguet may not work for the Tingguians of Abra. For one, the people in Tineg plant rice only for subsistence. When asked for the sources of raw materials for a proposed food processing project, they answered, "ado met lang ma'am ditabanbantay, inmulani Apo Dyos." (There are plenty of sources in the mountains, they were planted by God).

This became even more evident during the second day of our visit. We travelled through very rough roads to reach Tineg River near the boundary of the municipality of Lagayan and Tineg. We saw houses, shacks if you will, the residents of whom rely solely on hunting in Tineg's forests for their income. We saw how poor the people were, despite the abundance of natural resources around them.

But then again, who's to say they are poor?

Maybe they are poor based on the world's definition of poverty. But maybe, they are richer when it comes to knowing the secret of living the simple and contented life.

According to Emil Javier in his paper, (Technovilles, 2012), crucial to the success of and distinction of this program is that "technology and scientific information could be made to bear on the national goals of eradicating poverty, raising livelihoods, ensuring food security as well as providing a healthy and physically safe environment."

Such pronouncement is a basis for the DOST CEST program since it offers a holistic strategy that answers such needs through science and technology infusion.

On the third day of our Tineg adventure, we met with Mayor Corinthia Crisologo along with some barangay officials to outline the results of the benchmarking activity. While we were careful in explaining that the proposed projects will still go through DOST-CAR management, we also assured them that management committed to help the municipality through the CEST program.

And so, as the team left for home, there was this sense of purpose, a duty that gnawed on me that I should deliver the results of the benchmarking activity effectively to the regional office; that government agencies should exist to ensure that services are brought to the people who need it most, no matter how remote or difficult the assistance would be.

According to the World Health Organization, "Community empowerment refers to the process of enabling communities to increase control over their lives. It is more than the involvement, participation or engagement of communities. It implies community ownership and action that explicitly aims at social and political change. Community empowerment necessarily addresses the social, cultural, political and economic determinants that underpin health, and seeks to build partnerships with other sectors in finding solutions."

I believe that Jean Vanier sums it best when he said, "Many people are good at talking about what they are doing, but in fact do little. Others do a lot but don't talk about it; they are the ones who make a community live."

Update: The CEST Project for the Municipality of Tineg was approved for implementation this CY 2015-2016 by DOST-CAR Management. Activities are now underway for the full implementation of project activities that were identified by the community beneficiaries, DOST-CAR and LGU-Tineg during the benchmarking activity in October 2014.

The "gilidan," the traditional way of grinding corn. *(Photos by Hansi G. Dinumla, DOST-CAR)*

It was a remarkable statement for every student gathered inside the Adamson University Theater, when Prof. Joel Zaporteza of Adamson University (AdU) formed the equation that best explains science journalism. Dianara D. Angeles tells us more.

FOR SOARING FALCONS

Science Journ is Intention + Sensibility + Advocacy + Accuracy/Responsibility

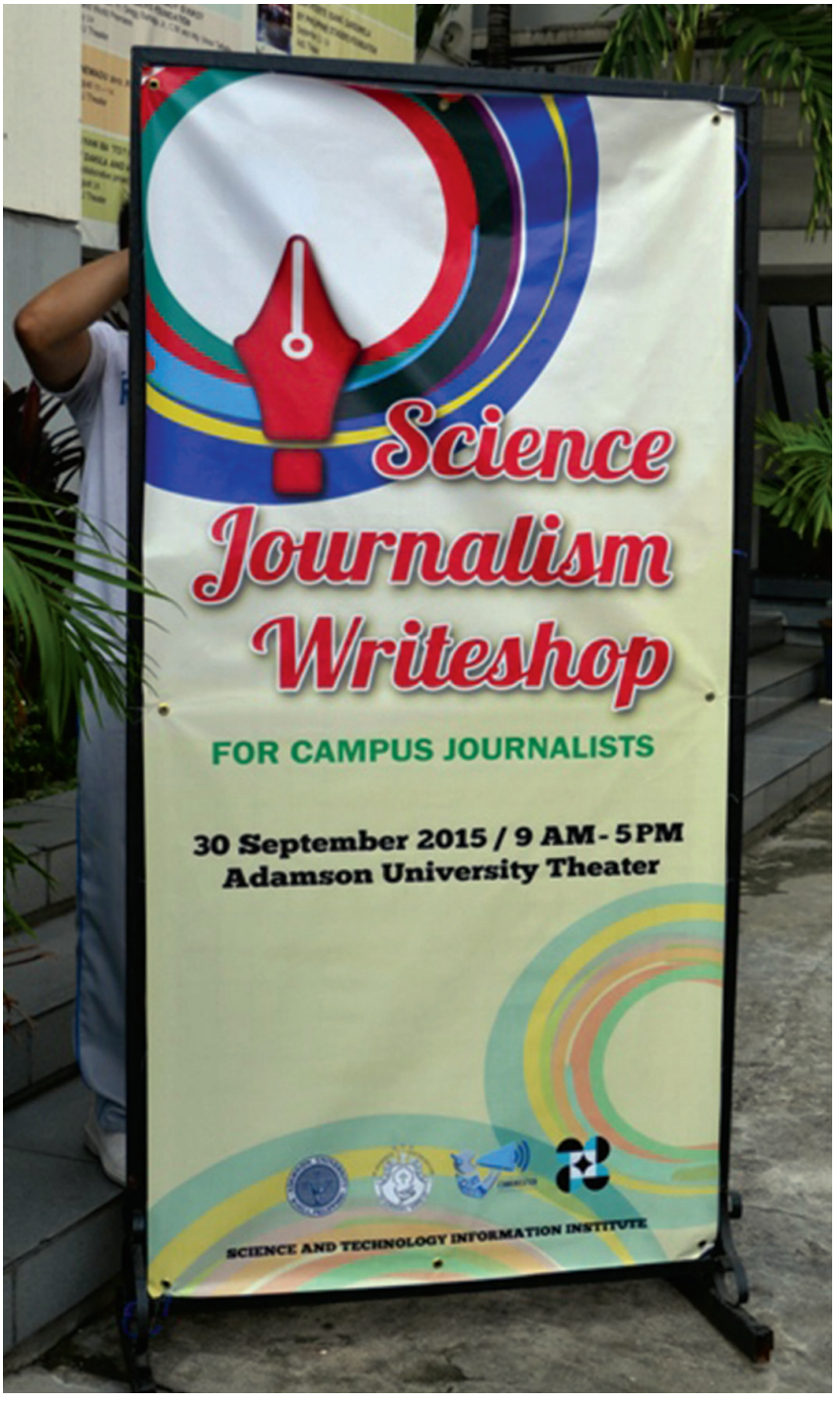
The five core ingredients were formulated after the lessons on science journalism discussed by the guest speakers during the Science Journalism Writeshop for Campus Journalists conducted by the Department of Science and Technology-Science and Technology Information Institute (DOST-STII) last September 2015.

Some 200 mass communication students, mostly graduating ones, participated in the said writeshop, the first to be held in Adamson. Its panel of resource speakers were Ruby Cristobal of the Philippine Association of Science Journalists, who gave a backgrounder on science journalism; Shaira Panela of Rappler who provided basic tips on environmental journalism for online; and Ken Adrian Aracan, chief of Project NOAH WebGIS, who introduced the young participants to Project NOAH or Nationwide Operational Assessment of Hazards. Project NOAH is a flagship project of DOST that uses advanced technology for disaster prevention and mitigation, allowing the country's warning agencies to provide a 6 hour lead-time warning to vulnerable communities against impending floods.

"Writing what is happening around us is very significant and important to be able to disseminate the information to the least of the Filipino people," Dr. Nuna Almanzor, executive director for Adamson's Center for Research and Development, said in her opening remarks.

"Functionally, science journalists are advocates of science," Cristobal added, explaining that the role of a science journalist is to bridge science and the public. Cristobal, who is also with DOST's Science Education Institute, got the ball rolling when she started off with an interesting overview of science journalism, mentioning historical bits of information such as the 1969 landing on the moon by Neil Armstrong and his group, among others.

"You have to go to what's popular. Stick to the facts, use terms judiciously," said Panela as she shared



Resource speakers (from left) Ruby Cristobal of the Philippine Association of Science Journalists, Shaira Panela of Rappler, and Ken Adrian Aracan of Project NOAH WebGIS.

tips on writing science articles that are easy to understand and catch more attention and reminded the participants to "understand the online environment." She also said that the youth are the best writers for environmental stories.

Aracan also advised the students to use the proper terms and information according to the situation. "Tamang impormasyon, sa tamang sitwasyon (The right information for the right situation)," he told them to emphasize his point.

After the speakers had delivered their presentations, a 1-hour writing exercise took place where the students wrote feature articles based on a news article and an editorial piece on climate change. The exercise was followed by a critique session for selected articles by the participants. During the critique, Panela advised the youngsters to make reading a habit in order to improve

their writing. "Start with the classics," she urged them.

Undeniably, the seminar garnered gratitude and appreciation from the faculty, speakers, and the students themselves.

As a member of the student publication's editorial board, Carizza Ibañez pointed out that the seminar would be of great help for her to become an effective writer, to express what needs to be expressed in terms of environmental issues. She also voiced her sentiments on environmental issues which are not given much importance. "The lack of information of people is one of the problems why it is not given that much attention," she explained.

Another student, Carmina Llanto, was excited simply because the writeshop was the first to be held in their university.

"I wish that I have been able to inspire the students in the same way they were able to inspire me to be better in my craft and to write more stories because I know that somehow, somewhere, these students will be reading about me and the about the stories I'm writing," said Panela.

Meanwhile, Prof. Joel described the event as a wonderful experience for both students and teachers.

"For the teachers, it's a wonderful experience because it's nice to hear directly from the horse's mouth and the experts, of course, as to how really they can write about the science-based topics. For the students, this is a rare opportunity where they can actually be exposed into experts who could deal with how they will be able to develop their ability to write in layman's terms," he explained.

When asked what comes next after the event, Prof. Joel said that their next concern is how the knowledge gained by the students from the writeshop will be sustained and how it will be used. "And I think, far more than the learning, this challenge is what we are about to take," he said.

WHEN PASSION DRIVES BUSINESS

Healthy food for kids

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

"But what sets apart our product is that it has a seal of FNRI, and that counts a lot, when your product ranks high in terms of efficacy,"

Racky Doctor, president of Long Live Pharna

How he ventured from safe water to rice and mongo snacks constituted sense, timing and luck. It started when some people in emergency situation asked him, "You already have water that's useful during emergency situation, why not food?"

"I've pondered on it and figured, why not?" Racky D. Doctor, president of Nutridense Food Manufacturing Corporation (NFMC), reveals.

Eventually, an opportunity came when the Food and Nutrition Research Institute of the Department of Science and Technology (FNRI) conducted a forum on complementary food and he was among the invited. He showed up and that began his passion for good food.

NFMC is the company behind the healthy snacks, such as RIMO Curls, RIMO Blend, Micronutrient Growth Mix, Brown Rice Bar, Iron-fortified rice and Momsie. These products were developed to address the malnutrition problem among Filipino children, especially those below five years old.

"There are other players in the complementary food industry. But what sets apart our product is that it has a seal of FNRI, and that counts a lot, when your product ranks high in terms of efficacy," says Doctor, who joked that he's been a doctor since birth, carrying such a family name.

Healthy food continues to gain popularity, what with the country's rate in diabetes and cardiovascular diseases. But this is mostly for adults. However, for the children, one of the biggest challengesis still malnutrition. The 8th National Nutrition Survey (NNS) cited that

the number of Filipino children aged 0-5 who are "wasted" – too thin for their height – even increased from 6.9 percent in 2008 to 7.9 percent in 2013.

Beginning: From pharma to food

Racky Doctor and his family have always been in business-- initially in the pharmaceutical industry before branching out to healthy food products. During the acute gastroenteritis outbreak in 2004, the World Health Organization (WHO) introduced a water disinfectant for communities affected by said outbreak. It was by some luck that no such product was then available in the local market.

WHO called upon interested parties who can manufacture the said product for

business.inquirer.net

Racky Doctor and wife Divine, finance officer, display RiMo curls and RiMo instant baby food blend.

Photos by Henry A. de Leon, S&T Media Service, DOST-STII)

the local market. Of the five interested, Racky Doctor was chosen. His company, the LongLive Pharma produced the Hyposol, a water treatment product.WHO and the Department of Health (DOH) endorsed Hyposol in calamity and outbreak infected areas.

Understanding the big picture

Doctor first became a client of DOST through its other program, the Small Enterprise Technology Upgrading Program (SETUP), as a recipient of an equipment assistance. Being a beneficiary, he got invited to some enterprise-related forums, including one that featured complementary food.

He used to have a limited view of healthy and complementary food. Now he is grateful for the opportunity to learn about it in the FNRI's forum.

"After attending the FNRI's forum, I was able to see the bigger picture. I thought I was merely embarking on good food, but it is bigger than that; that of a national problem – the malnutrition," says Doctor.

Fighting malnutrition has become their family's advocacy. The rate of malnutrition is quite high and he believes that somebody has to do something, especially for the children in rural areas.

"While doing something about it, we can make it a business after all. So magandang impact. You do business and create an impact to the community," says Doctor.

They have initially invested over Php 8 million to their food business with the help of seven to nine production people, plus four administrative personnel. Today, they have increased their production people to 37 and 13 office staff.

"Initially, we produced Rimo Curls under LongLive Pharma but it was awkward to have medicine and food together, so we opened NFMC in 2014 which solely caters to the manufacture of our food products," Doctor explains.

While there are other brands which manufacture complementary food, NFMC is the only one currently in the local market which produces iron-fortified rice kernel. They also supply iron-fortified rice in many parts of the country.

Challenge and expansion

While NFMC is complete in terms of equipment and the company can easily call on other workers in the community in case of increase in demand, what the company needs now is a bigger space. This is the reason why NMFC has an ongoing plant expansion-- in anticipation of bigger demands for its products in the near future.

The company's production people are also undergoing training with for Good Manufacturing Practices with Technology Application and Promotion Institute of DOST.The company also availed of support from the Philippine Council for Industry, Energy and Emerging Technology, Research and Development in terms of market links.

Doctor sees the possibility of processing mangoes from Pangasinan instead of importing the fruits from Cebu. This way, more folks from his community will be employed.

Doctor is grateful for the collaborative support he's been getting from DOST and its different agencies. He believes that he will not be in the food business if not for FNRI that gave him the idea and has been helping him with product development since 2013, when his company manufactured Rimo Curls.

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, food processing facility development in the regions, food analytical testing services and many others. For details on their services, visit http://www.fnri.dost.gov.ph/

Photo from FNRI

Environmental Awareness Month

Nov. 25-27, 2015

"Green Innovations for Healthier Lifestyles"

Engaging in an environmental activity can increase the awareness and appreciation of DOST employees to choose a greener and healthier lifestyle. Green and healthy lifestyle promotes a balanced view on nutrition, environment-friendly day-to-day practices and the ability to live a better quality of life. Thus, it is high time to celebrate the Environmental Awareness Month in DOST Bicutan to intensify the passion to care for the environment and for a healthy well-being.

At the same time, involving DOST Bicutan employees, their kids, and employee associations can increase the solidarity necessary to achieve a common goal - efficiency and productivity. Healthy social relations serve as a strong foundation to have a more solid voice in promoting greener and healthier options for a positive impact in work performance.

Venus Raj goes green. The former Ms. Universe runner-up talks about being good stewards of the planet and her personal advocacy for the environment in a forum titled "Green Advocacies – Healthier Lifestyles" *(Text and photos by Maria Luisa S. Lumioan, S&T Media Service)*

"Indak Pa More: Green and Healthy Retirement Opportunities" gave participating members the opportunity to attend the following sessions: "Reflections through Dance" by Prof. Alberto Dimarucut and Prof. Jaime M. Santos of the UP College of Human Kinetics; "Green Passion for Green and Healthy Business" featuring Tsaa Laya, a social enterprise of exquisite tea collections; and a session with Raymond Lim, founder and CEO of TLC Training & Consultancy, RB Global Holdings Pte, and RBG Philippines Inc. about how to harness their talents to have a happier, healthier, and wealthier life. *(Text by Ma. Lotuslei P. Dimagiba / Photos by Ceajay A. Valerio and Ma. Lotuslei P. Dimagiba)*

Tsaa Laya's tea products

SIKAT also celebrated the "Araw ng Pagbasa" and the "Children's Welfare Month" through book reading sessions with the DOST Day Care and Upper Bicutan Elementary School students. The kids had a great time listening to four Adarna Books read by Joan Magalong (volunteer story-teller of Adarna House), Catherine Untalan-Vital (2006 Miss Earth Philippines and founder of MyBirthday Foundation, Inc.) and Cleofe Velasquez-Ocampo (IATSS Forum Alumni Philippines President). The kids learned to eat the right foods for a healthy body, to challenge their imagination, and to respect life and the environment. "SIKAT hopes that the young minds of today can be enriched through book reading," said SIKAT Vice President Diane Marie C. Bernardo.

DR. MARIETA...*from page 63*

Photo by Henry A. de Leon, S&T Media Service, DOST-STII

But to answer this question, other questions have to be answered first, the indefatigable Dr. Sumagaysay pointed out.

The first of these is the question 'Where are we now?'

Finding the answer to this question is the first thing she would do in January, she told S&T Post. "That's why I need all those accomplishment reports and the strategic plan….I want to see what have been done, what facilitated its accomplishment, and we strengthen those…. then we see what are the challenges, then we address those challenges," she elaborated.

The second question is 'Where do we want to go?'

"We revisit the mandate, the mission, vision, objectives. Which are realistic? Which are doable this year?"

And finally, the question 'How do we get there?' for action planning.

Foremost in her mind is the issue of greater visibility and relevance. Though NRCP has already been trying to put together some research findings for possible policies, Dr. Sumagaysay said they should do more than that.

"From basic research until making people happy, it's a long stretch. Our output should be picked up by applied research until commercialization, until it is used by people and then they have healthier lives, they are more happy, have more income, more employment. But what is not seen in that stage is that it all started with us – basic research. Most of the time, we are invisible in the sense that what is usually seen by the public is who gave us the new product," she explained.

Expanding its influence to other government agencies is another thing she

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MONTEJO SALUTES...*from page 36*

program, the Nationwide Operational Assessment of Hazards or Project NOAH.

"By using the latest computer software and cutting-edge technologies like the LiDAR or light detection and ranging, we were able to create a 6-hour early flood warning system by generating high-resolution topographic flood hazard maps in all the 18 major river basins in the country, thereby providing vulnerable communities accurate and timely information about weather and hazards," he said.

Project NOAH spawned success stories like those during typhoon Pablo when zero casualty was reported in Cagayan de Oro, the same city devastated by typhoon Sendong in 2012. The project was also instrumental in having zero casualty in Marikina during the *habagat* episodes of 2012 and 2013 and during typhoon Ruby in December 2014.

In addition, Montejo bannered the different technologies developed by DOST in only a span of five years like those in genomics for agricultural and healthcare applications, mass transport solutions like the Automated Guideway Transit or AGT and the Hybrid Electric Road Train, Food Innovation Centers which serve as food processing hubs in the regions, and the Electronics Product Development Center, to name a few.

"We have a wealth of S&T information at the DOST at binubuksan namin ang pinto ng DOST para maramdaman ni Aling Maria at Mang Juan ang siyensya at teknolohiya (….and we're opening our doors so that Aling Maria and Mang Juan will feel the essence of science and technology). We have created a whole ecosystem that empowers your creativity as innovators and technopreneurs to be one community. By developing good products, the whole world becomes your market," he said.

Science Nation Tour is a shared initiative of the DOST-NCR Office under the leadership of Director Teresita C. Fortuna and the whole DOST system including PHIVOLCS, PAGASA, Science Education Institute, Technology Application and Promotions Institute, and others joining the weeklong celebration with entrepreneurs sharing the limelight as partners in achieving the country's economic development agenda.

Satellites dissect Nepal quake

By JONATHAN AMOS
BBC Science Correspondent

THE DEEP anatomy of last year's devastating quake in Nepal is revealed in a new analysis by scientists.

Satellite data is used to show where and how the rocks ruptured under the country, leading to the loss of more 8,800 lives.

The Magnitude 7.8 tremor occurred at a point where the main fault takes a deep dip just south of the high Himalayas.

This "ramp" structure, as the group calls it, probably also plays a key role in building the famous peaks.

As tectonic forces drive the Indian subcontinent under Central Asia, rocks ride up the ramp, adding a few millimetres a year to the height of the snow and ice-capped mountains.

John Elliott from Oxford University, UK, and colleagues report their assessment of the 25 April quake *in the journal Nature Geoscience.*

They examined images from Europe's Sentinel-1a radar satellite and other spacecraft to map the buckling of the ground.

These pictures enabled the team to infer what was going on deep beneath the surface.

The researchers trace the quake activity to a locality some 10-15km down.

It was spread across what they term a "hinge point", where the main fault in the region transitions from being relatively horizontal to being sharply angled into the Earth.

This geometry has a number of consequences, the scientists say.

First, it neatly explains why the surface surrounding the capital Kathmandu rose up by about a metre during the quake, and dropped by roughly 60cm in the more mountainous terrain to the north.

And, secondly, it also provides a good model for how the Himalayas gain height over time.

The team proposes a cycle of slumping on the occasion of major quakes and mountain-building in quiescent periods, with the increase in elevation dominating over the long term. The high Himalayas currently gain on average about 4mm per annum.

Last April's tremor occurred in what scientists refer to as a seismic gap - a segment of the fault that has not experienced any significant strain-releasing activity in a long while.

The 2015 shock brought relief only to the far eastern sector of this gap, meaning the potential for future large quakes is still present to the west.

And there is potential also to the south.

The latest analysis demonstrates that the main fault did not rupture all the way to the surface on 25 April. It stopped abruptly some 11km under Kathmandu.

"There is still half of the fault - that's going south of Kathmandu, from a depth of 11km up to the surface - that hasn't yet broken," Dr Elliott told BBC News.

"Our hypothesis is that the abrupt stop is because the main fault has been damaged and it was held up where it intersected with other, smaller faults. But this will only be temporary.

"These earthquakes tend to happen on the century timescale, but this barrier could be pushed through on a shorter timescale. Of course, our problem is that we are not able to predict when; we can never give a date."

The Oxford scientist said that if the remaining portion did break all the way to the surface in one go, it would likely produce a quake of similar magnitude to the 25 April event, but being much shallower could have more damaging effects.

SOURCE:
http://www.bbc.com/news/science-environment-35286798

nepal earthquake.jpg

MOVIE REVIEW

"The Martian"

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

Space explorations have advanced, but the human race has yet to send a manned mission to Mars. It is this idea of a manned mission to the red planet that some filmmakers had toyed in "The Martian."

The plot piqued my interest and the movie had me glued into the screen as the story progressed at a quick pace.

Mark Watney (Matt Damon) is part of a crew who goes on a manned mission to Mars. They experience a strong dust storm which knocks down vital communication satellite, causing Watney to be unconscious.The crew then evacuates, mistakenly presuming Watney to be dead and leaves him behind. When he snaps back into consciousness, Watney realizes his predicament: he is alone outside the space station and the food supplies available are limited.

To solve the problem, he improvises a farm—planting potatoes out of the space station using Martian soil, fertilized out of his and other crew members' wastes.

He tries contacting Earth using an abandoned communication facility from a previous probe, which had been down for a long time due to the absence of power supply. With this, NASA is able to send him communication protocols to communicate using text messaging.

Other obstacles come in the way of Watney's rescue. Will he be brought back to Earth?

This amazing story brings forth questions on the accuracy of the details.

Is it possible to grow plants on Mars? The answer is a resounding yes. In an interview with IFLScience.com, Dave Lavery, program executive for Solar System Exploration at NASA headquarters maintains that "in terms of basic mineral content and chemical content, yes it would be possible to grow plants in Martian soil. We actually have experiments going on right now using simulated Mars soil, and it indicates that's a very realistic idea."

Second, is gravity assist trajectory real? The movie presents a maneuver called gravity assist trajectory to help the crew to swing back to Mars. Gravity assist trajectory refers to an occurrence when the planet orbiting the sun changes the spacecraft's velocity by increasing its speed when it gets near to it and move into the planet's same direction before pulling out when it gains speed and propels it. According to theory, the spacecraft's speed triples as it enters the planet's gravity as long as the spacecraft continues to use its thrusters.

Time.com says that this is actually true. "That's entirely possible. Such a slingshot maneuver—or gravity assist—was what guaranteed the first few Apollo lunar crews a free ride home if their engine failed as they were approaching the moon."

One detail that experts disagree with is the dust storm in the movie. Storms on Mars are not as tough as they are indicated to be in the movie. "The Martian atmosphere is only 1% as thick as Earth's," says an article in guardian.com. "So a Mars wind of 100mph, which is possible although quite rare on the surface, would only have the same dynamic force as a 10mph wind on Earth. You could fly a kite in it, but it wouldn't knock you down."

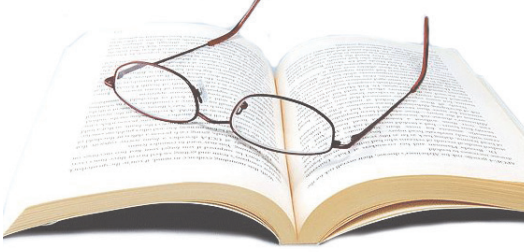
Also, one basic detail that may have been an oversight on the part of the filmmakers is the gravity on Mars. In one scene, Watney walks as if he is somewhere in Porac, Pampanga, with heavy steps and panting occasionally as he lifts a shovel full of dirt. The truth is, according to IFLScience.com, Mars "has about 30% of the gravity our own planet has."

Many pundits have given their thumbs up for The Martian. I am more of a skeptic when it comes to the idea of colonizing Mars. It is more of a farfetched idea, considering the improbabilities of migrating there - as farfetched as having the person next to me sell me a tablet computer while I am living in the 18th century.

However, there are things that only visionaries can see and science can bring into reality. Our mission to Mars may someday happen - not in a few years but a generation maybe.

*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.*

The Scorch Trials



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

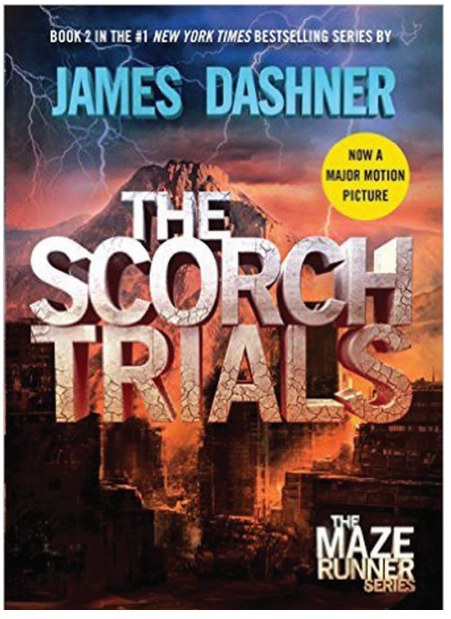
Dystopian fiction novels have grown tremendously popular among book aficionados.

One of the popular authors of dystopian novels is James Dashner, the person behind the hit science fiction series, The Maze Runner with five book releases, namely The Maze Runner, The Scorch Trials, The Death Cure, The Kill Order, and The Fever Code. Its first film installment was released in 2014, which drew more interested readers to its second book.

The Scorch Trials is a young-adult dystopian science fiction novel published in 2010. Following the success of the first book, The Scorch Trials likewise obtained a lot of readers. But unlike The Maze Runner, The Scorch Trials is more ominous, deep and confusing.

The book starts with the lead character Thomas and other teenagers called Gladers who have just escaped from the experimental maze set up by scientists from WICKED or the World In Catastrophe Killzone Experiment Department. They are put into dormitories by their rescuers and are made to believe they are already safe from the maze and from WICKED. However, they are one day awakened by the attack of aggressive people known as Cranks and are shocked to discover that their rescuers are dead. Once again, the Gladers are released to the world of the deadly wasteland.

They manage to escape however but discover that the only female in their group, Teresa, is missing from her room. They find a boy named Aris in her room instead. Aris explains that like Thomas' group, dubbed Group A, his group, dubbed Group B, underwent the same maze experiment. Later, they find out that Thomas has been marked as the one "To Be Killed by Group B." They also get infected with Flare - a degenerative disease that transforms a person into a demented, cannibalistic monster. The disease is caused by a virus created by the sun. For them to be cured, they must get through the Scorch, the burned section of the Earth, to make it to a



"safe haven" up north. This takes place in phase 2 of the experiment, according to one scientist from WICKED.

The book then shows their adventures and the different trials they face along the way.

Although the story has the same formula as other generic dystopian novels today like The Hunger Games and the Divergent trilogy, The Scorch Trials still has that angst that a reader is looking for in a book. Apparently, its intense and suspenseful action help in making the story appealing, especially if the reader is a fan of its predecessor, The Maze Runner.

What is unusual about the book is that it is already enthralling at the start, continuing exactly where The Maze Runner concluded, making it consistent with the first book.

It also lives up to its genre as a science, dystopian fiction since it highlights a lot of scientific components in the stories, including the characters being under a research trial, how the sun causes a virus and its effect on the people and community, how each experiment is centered on science, among others, set in a dark, futuristic situation.

Putting together science and dystopia in one book is interesting.

Maybe the reason why dystopian novels like The Scorch Trials are famous is because these stories are honest. Dystopia is somehow an extrapolation of our currently distressed world, and situations like those described in these kinds of books can happen in the future. Stories with plots like that of The Scorch Trials should be read by young adults today as its metaphors can expose us to the reality and offer possible solutions, setting aside the eerie parts.

But if you read The Maze Runner, you might notice that it is more fun to read and understand than The Scorch Trials at least based on my own preference. It is a great follow-up to the first book, but maybe not all sequels surpass the original one.

For one, the storyline becomes too fast paced and baffling that the readers should be careful not to miss any part. Also, in between are twists and turns in the story that are somehow bewildering. There are also a lot of circumstances where Thomas intentionally almost dies but is transient and eventually lives. The plot is great, although most parts are confusing, including its cliffhanger ending.

However, word choices are also effective, making the readers linger on every part of the story. It is also good that the lead characters that I loved are continually emerging in the story, though I pity them because their sufferings are still not done. Readers will definitely look forward to the next book.

Just a reminder: I recommend you to read The Maze Runner first before heading into The Scorch Trials to get on track.

*S&T Post welcomes contributions for our **Book 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.*

DR. MARIETA...*from page 76*

hopes to achieve for NRCP as a provider of policy advisories based on the basic researches being done by its 3,000 plus members. "I may not have the answer," she said, "but everybody may contribute to the answer to the question. That sense of ownership of certain ideas will actually motivate all of us."

Family life

She may have carved an outstanding career in teaching and research but her family is certainly not relegated to the background.

After earning her MA in Economics from UP Diliman, she tied the knot with a man who shares the same love for bossa nova, acoustic, and saxophone music. Now, she and husband Jonas have raised a close-knit family with three driven and supportive kids: son Laser Blitz who is a lawyer; daughter Kreem Yzra who is on her postgraduate internship at University of the East Ramon Magsaysay Memorial Hospital; and another daughter, Kristel Dame who is a 4th year medicine student at Far Eastern University-Nicanor Reyes Medical Foundation.

The Sumagaysays love going to the beach, visiting museums, and traveling every year. Their last overseas trip as a family was to South Korea in 2013.

From their travels, she collected coins and bills which she put together in an album. She was also into stamp collecting. Sadly, later that year, Yolanda made her landfall and took away their travel pictures, her coin and stamp collection and everything else including their laptops, cars, and appliances.

"Nothing was left," she said, recalling the experience of seeing the water rise up to 7 feet inside their house in Tacloban and how they struggled to get out as furniture and other things floated around. Outside, they saw a neighbor's car roll out of the garage, floating in water, as well as their other neighbors already on the roof of their houses.

Now, things are different for the Sumagaysay family. They no longer buy new models of anything; they just have the basics, nothing more. "We have to help others rebuild, instead of spending for something," she said. "You are here, not just for yourself."

DOST UNVEILS...*from page 8*

that contain 17% stabilized rice bran. It is also ideal because with this technology we extend its shelf life from 24 hours to as long as six months," revealed Dr. Blanca J. Villarino of the University of the Philippines College of Home Economics.

The machine is very ideal for micro, small and medium enterprises (MSMEs) because the design is compact, easy to maintain and clean. Furthermore, it does not produce greenhouse gas emissions and can be fabricated in much lower manufacturing cost.

On the other hand, the Superheated Steam Treatment System (SSTS) is used to stabilize brown rice to prolong the shelf life from 1-2 months to 5-9 months. The SSTS uses and controls superheated steam to deactivate the enzymatic activity to extend shelf life of brown rice, thereby making it more competitive in the market. It combines steaming and drying while retaining the sensory acceptability and quality of brown rice without chemical additives.

Developed in cooperation with the DOST-Food and Nutrition Research Institute and with funding from the DOST-Philippine Council For Industry, Energy and Emerging Technology Research and Development

The locally fabricated SSTS machine has several components: a conveyor and precise control system for easy loading, spreading and discharging of the brown rice; a steamer made of food grade stainless steel to keep food free of contamination; and steam generator with super heater.

It has a capacity of 10 kilograms per batch and treatment time only takes 90 seconds at a temperature of around 120 degrees centigrade.

Both machines are ready for commercial adoption and Asec. Dizon is very confident that these technologies will greatly improve food processing techniques and benefit the thousands of MSMEs in the country.

LEADING NRCP's.._from page 62_

executive director. At NRCP, she maintained the same drive for excellence and applied the same strictness as she did when she was with PAGASA. "Short term lang naman ako dito, kaya kailangang higpitan ko (I'll only be serving for a short term, so I have to be strict)."

But then she added, "Pero bago ka sundin, kailangan sumunod ka (Before they follow you, you must also learn how to follow rules)."

"I also make sure, whatever I earn (from PAGASA and NRCP), kailangan commensurate ang naibabalik ko," she stressed.

Achievements

For her efforts and expertise in the field of meteorology as well as her scientific researches on the tropical cyclone tracks and unusual movements of typhoons, she was given the NRCP Achievement Award for Earth and Space Sciences in March 2013.

This proud Bulakenya from Balagtas town is equally esteemed by her town and province mates, as evidenced by the various recognitions she has received from different bodies in Bulacan. These include the Dangal ng Lipi Award (2010), Taas-Noo Bulakenyo (2006), and Natatanging Anak ni Balagtas sa Siyensya at Teknolohiya (2004).

Never forgetting her humble beginnings, Dr. Lao recalled, "Nung nag-umpisa ako sa PAGASA, pantay pantay din lang kami. Hindi kami mayaman nung pumasok kami. Ang sweldo ko lang ata noon nasa 240 pesos (When I started out in PAGASA, we were all equal. None of us were rich. My salary then was probably around P240)".

Now Dr. Lao is grateful that she is blessed with both a healthy mind and body which enabled her to do everything required of her as she forged her career path, rose from the ranks, and spearheaded the efforts of NRCP from December 2013 to November 2015.

"Kaya mag-aral kayo ng MS ninyo at Ph.D.," she advised. "Kasi yun ang naging bantayan namin (Earn your MS and Ph.D. because those served as our stepping stone)."

DOST-STII personnel at the 2015 Kuala Lumpur Engineering Science Fair: front row – Dr. Aristotle P. Carandang, chief of the communication resources and production division; second row – Lloyd R. Mandapat, science research specialist I and Benedict P Cagaanan, supervising science research specialist; back row – Arlene E. Centeno, chief of finance and administrative division, and Marievic V.Narquita, science research specialist II.

PISAY STUDES..._from page 51_

The KLESF

Organizers of the event said that the Kuala Lumpur Engineering Science Fair 2014 was the first of a series of annual programs aimed to promote interest in science, technology, engineering and mathematics (STEM) among primary and secondary school students. It was jointly organized by the ASEAN Academy of Engineering and Technology, Universiti Tunku Abdul Rahman, Malaysian Industry-Government Group of High Technology, The Institution of Engineers Malaysia, and Nation Science Center.

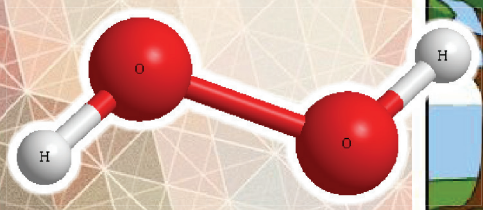
Among the objectives of the fair were to enhance school students' interest in STEM; enhance the awareness of the public on the roles and importance of STEM in socio-economic well-being and sustainable development; and enhance the awareness and participation of business and industry in promoting the learning and career development in areas related to STEM among the student and the community.

The KLESF Fair in 2015 was even bigger with the participation of ASEAN countries such as the Philippines, Cambodia, and Thailand which showcased their STEM projects and shared their experiences with the Malaysians. There were more than 100 Malaysian school teams who presented their STEM projects. Another main attraction in this year's fair was the thematic exhibition of the Year of the Light brought together by several universities and organizations.

Datuk Hong Lee Pee, chair of the 2015 KLESF, said that this year's fair saw increased participation from Malaysian universities and was more interesting with the thematic features on STEM, hands-on experiments, exhibits, and workshops for all ages mounted by organizations from both the private and public sectors.

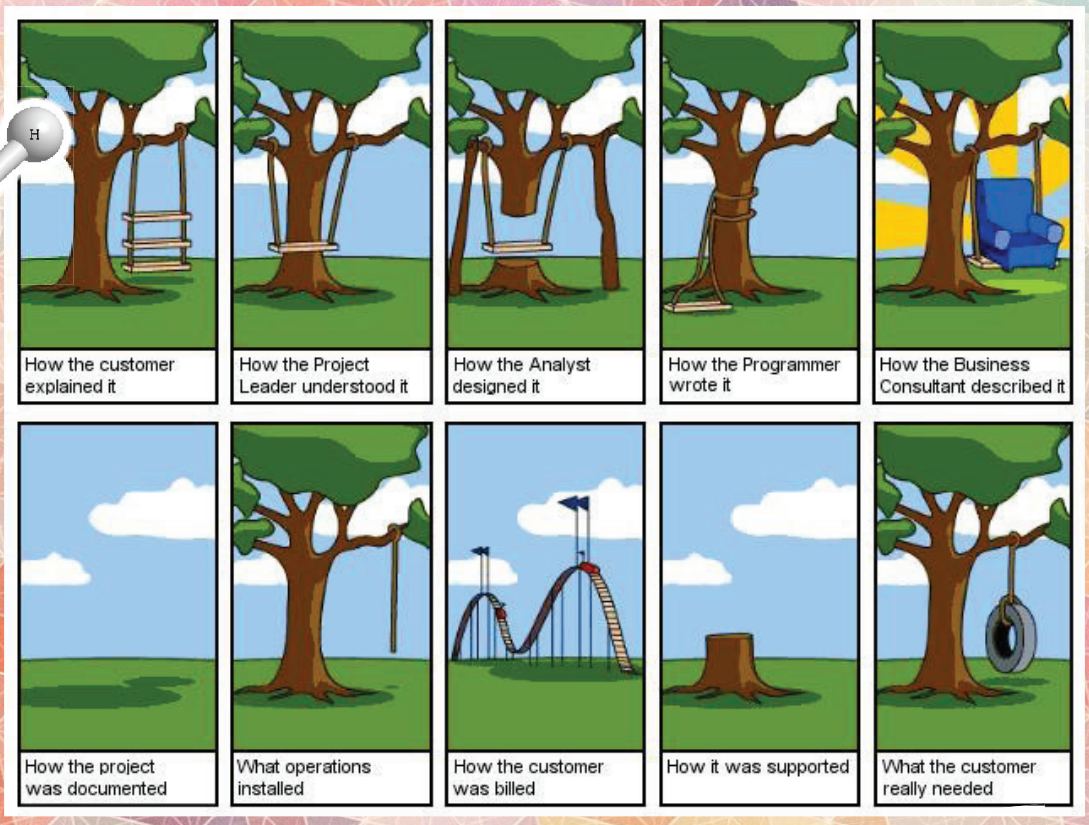
In an interview, he said that they truly appreciated the participation from the Philippines, Thailand, and Cambodia; and expected other countries to join the fair in the coming years.

just for fun.



Two chemists go into a bar. The first one says "I think I'll have an H2O." The second one says "I think I'll have an H2O too" and he died.

http://www.inorganicventures.com/fun-chemists)

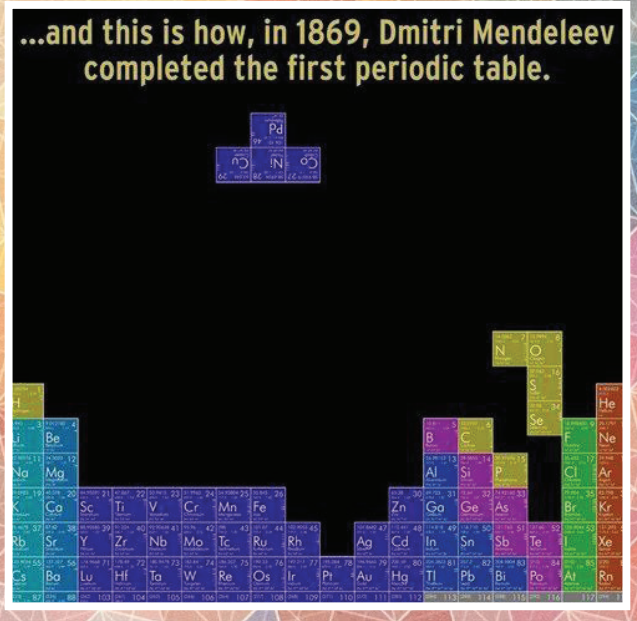


Why are tertiary structures selfish? Because the amino acids are all wrapped up in themselves.

The optimist sees the glass half full. The pessimist sees the glass half empty. The chemist sees the glass completely full, half with liquid and half with air.

(http://www.businessinsider.com/15-jokes-only-a-chemist-will-get-2013-10)

Do you know why the geneticist went to dental school? He was looking for an oral high gene.



Q: How do you tell the difference between a male chromosome and a female chromosome?
A: Take down their genes (jeans)!

http://web.pdx.edu/~newmanl/GeneticsJokes.html

Dr. Marilla G. Lucero of Department of Health –Research Institute for Tropical Medicine is conferred the rank of Scientist I by the Department of Science and Technology (DOST) and Civil Service Commission through its Scientific Career System. She took her oath under Dr. William G. Padolina, president of DOST's National Academy of Science and Technology (right) during a ceremony last December 9, 2015 at Acacia Hotel, Alabang, Muntinlupa. Dr. Lucero's research study contributed significantly to the inclusion of PCV in the Philippine national immunization program, preventing pneumonia among Filipino children.

(Top) DOST Sec. Montejo signs the renewal of commitment by agency members of the National Committee on Biosafety of the Philippines (NCBP) during NCBP's 25th year anniversary last October 27, 2015 at Chardonnay by Astoria, Pasig City. Said commitment is for a harmonized effort in ensuring the safe and responsible use of biotechnology products. DOST heads NCBP, the lead authority in developing policy guidelines and other significant protocols that promote and ensure biosafety in the country. ***(Text by Maria Judith L. Sablan, Photo by Gerry Palad, S&T Media Service)***

NEWEST ADDITION TO THE FILIPINO INVENTORS SOCIETY. Olivia Limpe-Aw, fifth-generation and first female chair and chief executive officer of 162-year-old Distileria Limtuaco, joins the Filipino Inventors Society as she presents her latest inventions: a utility model that uses mango as base for rhum (on the table before FIS President Benjamin Santos), and her latest procedure in aging using charred oak chips (bottom photo). To the inventors, Limpe-Aw advised, "Study what is not yet in the market, then create something to address that need—then you can make it big." ***(S&T Media Service)***

Dr. Aristotle P. Carandang, chief of the Communication Resources and Production Division of DOST-Science and Technology Information Institute (STII) delivers his paper on disaster management and community preparedness during the Association of Academies and Societies of Sciences in Asia (AASSA) Regional Workshop on SHER (Science, Health, Environment and Risk Communication) from December 8-9, 2015 in Jakarta, Indonesia. Composed of 34 scientific and technological academies and science societies around the world, AASSA aims to use science and technology for regional development in Asia and Australasia. ***(Text by Espie Angelica A. de Leon, S&T Media Service, DOST-STII)***

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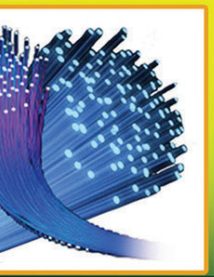



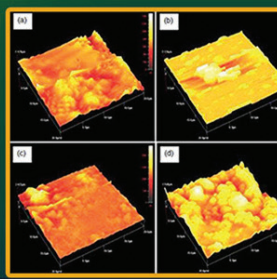

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The Managing Editor
Philippine Journal of Science
STII Bldg., DOST Complex, Gen. Santos Ave.

(02) 837-7520
(02) 832-2071 to 82 Local 2142
email: pjs@dost.gov.ph