

S&T POST

APR-JUN 2016



Going to Market

Brighter Prospects



One step at a time is arguably a sound strategy. Though no one has officially claimed that such exists, it can be deduced that such small strides can clear the path toward achieving success.

Recent developments in the area of technology commercialization have been perfectly executed when the DOST Technology Application and Promotion Institute (TAPI) organized the country's very first Technology Transfer Day on April 27, 2016. The agency has started to create the needed link between research and development (R&D) and technology commercialization. This was triggered, of course, by the passage of Republic Act 10055 otherwise known as the Philippine Technology Transfer Act; serving as the enabling mechanism for an efficient ecosystem that can facilitate smooth and faster transfer of technologies into the mainstream market.

In earlier information drives, one of the slogans for the legislative framework was "Creating Wealth: From Public R&D to the Market". As everything is falling into proper places, the four areas that make the initiative more concrete are starting to become stronger. These are Intellectual Property (IP) Policy, Technology Transfer Protocol, Fairness Opinion Board/Report Guidelines, and IP Management Protocols.

The DOST-TAPI emphasized that appropriate actions are undertaken to ensure the market-readiness of

local technologies as they provide support in the pre-commercialization of the R&D outputs. "While these programs and policies are instrumental in setting up a clear program for protection, sharing and transfer of innovations, the role of the private sector in the whole technology transfer pathway is still pivotal and crucial in propelling it into a more holistic and integrative technology adoption," the agency said. It further stressed the importance of solid partnership between research institutes and the private sector.

The agency, through its director Engr. Edgar I. Garcia, said that it promotes technologies that are within the five-pillar innovation ecosystem that, in one way or another, might contribute to raising the country's performance in global competitiveness. These are Agricultural Productivity; Industry Competitiveness, Countryside Development, Disaster Risk Reduction and Mitigation, and Quality Healthcare.

Perhaps, what was truly noteworthy in that event was the fact the locally developed technologies classified as "mature" generated interested parties as adoptors right there on the floor. Unfolding right before everyone's eyes was a somehow changing perspective among Filipinos who have started believing that local technology really works. Should this changing mindset continue, the prospect for us becoming a nation that is technologically independent seems to be brighter than ever.

Aristotle P. Carandang, PhD

**S&T
POST**

VOL. XXXIV No. 2

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

papi

Like us on Facebook



EDITORIAL BOARD

Publication Director	RICHARD P. BURGOS
Executive Editor	ARISTOTLE P. CARANDANG, PhD
Editor-in-Chief	FRAMELIA V. ANONAS
Managing Editor	MA. JUDITH L. SABLAN
Associate Editor	ESPIE ANGELICA A. DE LEON
Art Director	BENEDICT P. CAGAANAN
Layout/Graphics	JAMES B. INTIA
Contributing Writers	DOST MEDIA CORE
Editorial Assistant	JOY M. LAZCANO
Photography	AUDIO-VISUAL UNIT
Circulation	FERDINAND D. CARTAS



The S&T Post is published quarterly by the
Science and Technology Information Institute-
Department of Science and Technology
(STII-DOST)
with editorial office at DOST Complex,
Gen. Santos Avenue, Bicutan, Taguig City.

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

Visit:
www.stii.dost.gov.ph

weather • science • technology • innovation • etc.



The Filipino Weather Channel
www.dostv.ph

Premiers May 30, 2016

@ DOST, we offer solutions



Please visit
www.science.ph
Department of Science and Technology



OUR COVER



A galore of products and services, either developed or supported by the Department of Science and Technology, are already in the market. Developed to respond to society's pressing needs, these technologies and products will not only bring in financial opportunities to investors but also provide benefits to end-users. RA 10055 or the "Philippine Technology Transfer Act of 2009" which facilitates the transfer and promotes the use of intellectual property for national benefit serves as the spokes that push the wheel of technology forward from the laboratory to the market. (Cover concept and design by James B. Intia)

what's new

- 4 Adlai as alternative staple food
- 5 DOSTv the Filipino Weather Channel in now LIVE on AIR
- 5 DOST Hybrid Electric Train

tech·new·logy

- 6 Shrimp & egg shell mix can clean up oil spill
- 7 Green mining technology
- 8 200 prototypes from 2,000 food concepts
- 10 Happy knees
- 12 System for near-zero combustion of biomass
- 13 Rice milk for a healthy, nutritious alternative beverage

DOST news

- 15 De la Peña, former DOST undersecretary is now science chief
- 16 PH to host 17th SCA Conference
- 17 Artist speeds up furniture production thru DOST-developed lumber dryer
- 18 FPRDI aids wood treatment plant rehab
- 19 Samar Island journalists hone science reporting in DOST workshop
- 20 Vietnamese journalists observe DOST's best practices in S&T info development and promotion
- 21 Fake journals alert

- 22 Brunei, Philippines win in int'l tilt for the gifted in science

science news

- 24 The lessons of Pinatubo eruption

main feature

- 26 Market Day for DOST technologies
- 30 Let's Shop: DOST-ITDI technologies now in market
- 33 Innovative food products show big market prospects
- 34 Gitara ni Juan: A harmony of music, science & culture
- 38 InteliSENSE: Making sense of autism using high technology
- 42 Geo Loom: Weaving geotextile that keeps nature and empowers people
- 46 Pushing for patent filings
- 50 Bamboo for shelter
- 52 Want to be a genius? Drink 'Tubig Talino'!

education

- 54 STARBOOKs eyed for overseas deployment
- 56 Priming pupils for the win: Pisay teachers share the groundworks in prepping up for international tilts

who's who?

- 58 DOST-NRCP recognizes outstanding Filipino researchers



- 65 Dr. Alumanda Dela Rosa:
Nuclear scientist, director, civil
servant par excellence

- 68 Pisay studes bag awards in
int'l math, science tilts

enterprises

- 70 Cater King Food Corporation:
Seizing new markets through
DOST's SETUP

regional updates

- 72 CamNorte folks find more
opportunities in pili oil extraction
and handicraft making

- 73 Get ready for 'emergency food'

- 74 Help the poor through innovative
research, DOST VII head urges
scientists in the Visayas

- 75 DOST IV-A gets
Philippine Quality Award

- 76 PUP accords top recognition to
DOST-NCR head

- 77 What's up at DOST-NCR?

book review

- 78 What Do You Care What Other
People Think: The Adventure of
a Curious Character by Richard
Feynman

movie review

- 79 "HER"

photonews

- 80 Images of Diwata-1

Contributors



Susana O. Abada
DOST-STII



Edgilyn R. Alcasid
DOST-NCR



Jessa Jael S. Arana
UPLB



Rizalina K. Araral
DOST-FPRDI



Joselito A. Carteciano
DOST-NRCP



Hans Joshua V. Dantes
DOST-PNRI



Sean Adrian T. Guardiano
DOST-Negros Oriental



Geraldine B. Ducusin
DOST-STII



Delia D. Gotis
DOST-ITDI



Adelia M. Guevarra
DOST-ITDI



Juan Carlo M. Manas
DOST IV-A



Fatima M. Moncada
DOST-STII



Karl Raven A. Ramon
DOST-STII



Lawrence M. San Diego
DOST-TAPI



Jade G. Villanueva
DOST-STII



Mario L. Rance
DOST-TAPI

Adlai

as alternative staple food

By **HANS JOSHUA V. DANTES**

S&T Media Service, *DOST-FNRI*



Left photos, top and below:
Ginampay variety of adlai

Right Photo: A PNRI
researcher measures the
height of the putative
mutant adlai. Its seeds
were irradiated with gamma
radiation.

HELPING TO overcome Juan Dela Cruz's challenges in agricultural production and food security, agriculture research specialists from the Department of Science and Technology – Philippine Nuclear Research Institute (DOST-PNRI) are developing better varieties of adlai, (scientific name: *Coix lacryma-jobi* Linneaus) also called "Job's Tears," which may serve as a substitute to the country's staple food crops such as rice and corn.

While just as rich in carbohydrates and protein, adlai is unfortunately not as well-known as its cousin crops, except among the indigenous communities. In other Asian countries, adlai is also used to produce flour, coffee, tea, wine, beer and vinegar, among other products. Adlai also has some medicinal properties that can help mitigate the symptoms of allergies, diabetes and even cancer. Lastly, adlai is also known for its resilience in the face of extreme conditions, such as droughts and typhoons.

With the unique advantage of gamma radiation, PNRI has been working since 2013 to improve the agronomic traits of adlai by making mutant varieties that yield more grain and mature earlier, while also having shorter heights to make the crops more resistant to lodging during typhoons. These improvements will also complement the Food Staples Sufficiency Program of the Department of Agriculture which encourages the diversification of staple food crops beyond rice by increasing production, ensuring market availability and lowering its prices.

Researchers from the PNRI Agriculture Research Section used the ginampay variety of adlai for mutation breeding in the Institute's experimental field, where the putative mutants are already in their third and fourth generations. After irradiating the seeds with doses of 100 to 200 gray (Gy), they are planted and grown for further observation.

The research and development studies currently show promising results as the putative mutant breeds yielded from 790 kilograms of grain per hectare (kg/ha) to as much as 900 kg/ha, which is around 30-50% higher than the yield of average crop breeds. Meanwhile, the putative adlai mutants were also 40-57% shorter than the unirradiated ones.

Aside from developing mutant varieties, PNRI also seeks to improve the fertilizer, soil nutrient and water management practices for adlai. Field experiments are also being conducted in partnership with the Bureau of Soils and Water Management under an International Atomic Energy Agency project on "Enhancing Productivity of Locally-Underused Crops Through Dissemination of Mutated Germplasm and Evaluation on Soil, Nutrient and Water Management Practices."

The PNRI researchers will continue to develop the adlai crops up to the eighth generation to complete the mutation breeding process.

DOSTv the Filipino Weather Channel is now **LIVE on AIR**

By **FRAMELIA V. ANONAS**

S&T Media Service, DOST-STII

WEATHER MATTERS. In a country frequented by typhoons and other disasters, people need to know and understand the weather on a daily, and even weekly or monthly, basis to be able to plan ahead and make themselves productive and safe.

And the DOST, home of the country's official weather agency, intends to help people living in the Philippines get the latest and most authoritative weather information through its latest online baby, the DOSTv.

DOSTv, the Filipino Weather Channel, aims to enrich DOST's delivery of weather information and broaden its range by using the television format on an online platform. It officially began its online broadcast on May 30 at www.dostv.ph. The site is mirrored at www.science.ph and www.dostv.ph/youtube.

DOSTv initially aired live from Monday to Friday at 11am to 12 noon only. But by the last week of June, DOSTv started its continuous airing of past episodes and has made these available for on-demand viewing.

DOSTv daily features the latest weather updates and forecasts, dam and water level updates, volcano watch, as well as science and technology stories and live interviews. It also includes special documentaries featuring weather-related phenomena, scientists, scholars, DOST-supported projects and activities, and other interesting stories. Gel Miranda hosts the program.

DOSTv, produced by the Department of Science and Technology through Science and Technology Information Institute, is supported by DOST offices and agencies. For DOSTv, Philippine Atmospheric Geophysical and Astronomical Services Administration fielded one of its weather forecasters plus its dam experts for the weather and water level updates, while the Philippine Institute of Volcanology and Seismology fielded one of its volcanologists for volcano updates.

DOSTv co-producers are the Philippine Council for Industry, Energy and Emerging Technology Research and Development and the Philippine Council for Agriculture and Natural Resources Research and Development.

Providing services for the documentary productions and daily broadcasts (for the month of June) is Keep Me Posted, Inc.



A screenshot of DOSTv's feature presentation on former Secretary Mario G. Montejo which aired June 27 at www.dostv.ph, www.science.ph, and www.dostv.ph/youtube.



DOST's Hybrid Electric Train (prototype train set) rolled on the tracks June 25, 2016 at the historic site of Tutuban Station, Divisoria, Manila. Developed by the DOST-Metals Industry Research and Development Center or MIRDC, the train had a demo run in collaboration with the Philippine National Railways. Running on both diesel and electricity, the train is expected to run at a top speed of 80 Kph with a 125-horsepower motor. It can accommodate 120 passengers per coach, or a total of 600 people for every train set that has a total length of 60 meters. (By Rofolfo P. de Guzman/ Photos by Henry A. de Leon, S&T Media Service, DOST-STII)

Shrimp & eggshell mix can clean up oil spill

By **ADELIA M. GUEVARRA**

S&T Media Service, DOST-ITDI

BICUTAN, TAGUIG City — A new green reversing technology to remediate oil spills on fresh and marine waters is being explored by the Environmental and Biotechnology Division of the Industrial Technology Development Institute (DOST-ITDI).

Led by Emelda A. Ongo, her five-member team has developed a mixture of chitosan (a by-product of chitin [pronounced as /'kai.tin/] from shells of shrimp, crab, or lobster) from shrimp and calcium carbonate for use as biosorbent to remove petroleum spills from water.

"Largely dismissed by some as a problem that 'will go away in time' what is alarming in oil spills is that the damage it causes is permanent and takes quite a while to clean up," Ongo explained.

As its natural characteristic, oil spills float on water and prevent sunlight from passing through it. This makes it difficult for plants and sea animals to survive. A coating of oil can kill seabirds, mammals, shellfish, and other organisms.

Ongo clarified, "We now know that it affects seabirds and other mammals because petroleum can penetrate into the structure of feathers and fur breaking down their insulating capability. This makes them vulnerable to temperature fluctuations; most commonly die from hypothermia."

In addition, oil that washes into coastal marshes, mangroves and other wetlands also coats rocks and sands, making the area unsuitable as plant and animal habitats. Those that sink into the mangrove environment can damage fragile underwater ecosystem, killing fishes and fish eggs, among others.

Everyday materials, new green results

Chitosan has long been used as a biopesticide. Its other uses for medical and industrial purposes have been increasingly receiving attention in research circles. Of particular interest is its industrial use as sorbent material for oil removal in water.

"There are other organic and inorganic materials which may do as well. It is indeed amusing to know that our everyday shrimp and egg have found themselves on our lab tables," Ongo said.

"Let me explain. While most have been using pure chitosan as sorbent material, we have chosen to work on chitosan, which come from shrimp shells, and calcium carbonate from eggshells. Why? Because these are waste materials that can be reused, are cheap, and widely available. In addition, their biocompatibility, biodegradability, and safety make for an ideal composite. Chitosan, of course, has film-forming ability while surface roughness in calcium carbonate make them excellent sorbent materials," Ongo explained.

Cleaning up oil spills is a great challenge, she admitted. Lack of technology and expertise, as well as great financial demands of the task, including factors such as amount and type of oil spilled, water temperature (which affects rate of evaporation and biodegradation), and type of shorelines and beaches can sorely test concerned groups

But what reassured her team was that they were able to show that a 50:50 composite of chitosan and calcium carbonate in flakes and granular forms works.

"Simply, we wanted to develop a material that has a strong affinity for oils rather than water." Combining chitosan with calcium carbonate thus dramatically increased adsorption capacity of the green technology.

Which then of the composite flakes and composite granules tested better?

Testing the composites using a 5000 ppm (parts per million) concentration of diesel oil and bunker fuel oil in synthetic wastewater, Ongo related that it "was a relief because they showed satisfactory results." Both scored a removal rate of 99.9 percent in the oil and grease test including a final concentration average of 4 ppm for composite granules and 5 ppm for composite flakes.

Not content, the team also conducted a Total Petroleum Hydrocarbon (TPH) analysis.

If at all, determination of the maximum capacity of the composite to absorb oil added substance to their findings.

Clearly, everyday materials are presenting new and exciting prospects to better address various needs. For now, Ongo and her team are battling for a green reversal technology for oil spills.

Green mining technology

By **RODOLFO P. DE GUZMAN**

S&T Media Service, *DOST-STII*

DAVAO, PHILIPPINES -- After extensive research and development, the Department of Science and Technology (DOST) has come up with an environment friendly process for extracting gold and copper sans the use of toxic chemicals like mercury and cyanide.

This technology uses the so-called “enhanced gravity concentration-flotation-extraction” process and uses an integrated tailings disposal and treatment system. This method assures that waste materials disposed in the environment are safe and considered as non-pollutant.

This program was jointly undertaken by DOST and the University of the Philippines Diliman-Department of Mining, Metallurgical and Materials Engineering (UP-DMMME).

The other benefit of this method, aside from being safe and eco-friendly, is the economic factor that will spruce up the small-scale miners’ income potential. The process allows an 85 – 90 percent recovery rate of gold and other valuable minerals like copper and zinc compared with only 40 percent using the old or traditional method.

This breakthrough technology will benefit thousands of small-scale miners in Nabunturan, Compostela Valley who rely on copper and gold mining as their sole source of livelihood. The technology introduced by the DOST is believed to be economically viable, safe, and sustainable, thus ensuring the miners with steady income while protecting the environment from hazardous wastes from mine tailings.

“This innovation that the DOST has developed will bring more benefits for our more than 300,000 small-scale miners all over the country because it poses no threat to their safety and to the environment as well because it does not use harmful chemicals like mercury and cyanide,” stated DOST Secretary Mario G. Montejo.

Last March 15, 2016, the DOST together with government officials of Compostela Valley led the groundbreaking ceremony of the Field Testing of the Integrated Gold-Copper Mineral



“BETTER MINE” IN COMVAL. Department of Science and Technology (DOST) Undersecretary for S&T Services Rowena Cristina L. Guevara (center, with eyeglasses) leads the ceremonial groundbreaking of the field testing for the Integrated Gold-Copper Mineral Processing Plant in Barangay Katipunan, Nabunturan, Compostela Valley. The plant will use an environment-friendly mining technology called floatation and gravitation, dubbed “better mine,” which uses no hazardous chemicals like cyanide and mercury. The technology is jointly developed by the DOST and the University of the Philippines Diliman-Mining, Metallurgical and Materials Engineering. *(Text by Rodolfo P. de Guzman/Photo by Henry de Leon/S&T Media Service)*

Processing Pilot Plant in Barangay Katipunan, Nabunturan, Compostela Valley.

In attendance were Compostela Valley Vice Governor and former Congressman Manuel E. “Way Kurat” Zamora representing ComVal Governor Arturo T. Uy and DOST Undersecretary for S&T Services Rowena Cristina L. Guevara representing Secretary Montejo. Other local leaders and DOST officials present were Antonio Beda Tullo representing Nabunturan Mayor Romeo C. Clarin, Katipunan Barangay Captain Paz B. Maglangit, DOST Region 11 Director Dr. Anthony C. Sales, Program Leader Dr. Herman D. Mendoza, Jose A. Anayo, Jr. of the Nabunturan Integrated Mining Development Cooperative, Dr. Jonathan Bayogan of the Compostela Valley State College, and Aniceto Bolifer, the landowner.

“We consider this as a milestone for the small-scale miners of Nabunturan, Compostela Valley because this new technology for

sustainable mining will surely benefit them in terms of increased income and protection of their natural resources; thereby proving to all that science and technology can improve the quality of life of our people in the countryside,” said Montejo.

This green mining technology developed after five years of research and field testing by scientists from the UP-DMMME is considered pro-poor, pro-environment and most of all pro-Filipino.

“We need to use science and technology to be at par with the ASEAN for economic and sustainable development and our small miners are targeted to be part of inclusive growth, para umangat ang kabuhayan,” said Usec. Guevara.

Similar testing plants have already been set up in other areas where gold, copper and zinc are abundant like in Barangay Gumatdang, Itogon, Benguet; Paracale in Bicol Region and in Barangay Del Pilar, Cabadbaran City, Agusan del Norte in the CARAGA Region.

200 prototypes from 2,000 food concepts

By **ADELIA M. GUEVARRA**

S&T Media Service, DOST-ITDI

THIS IS what former Science Secretary Mario G. Montejo exclaimed as he, together with other DOST executives, recently led the first public disclosure by the Industrial Technology Development Institute (DOST-ITDI) of an initial 63 product types developed from 1,016 product concepts.

Secretary Montejo told ITDI Director Maria Patricia V. Azanza, “We overshot by 125 percent our end goal of developing at least 50 product prototypes and more than doubled our target of 500 product concepts using the water retort. Truly impressive.”

Underpinning food technologies at FICs

ITDI's Food Processing Division developed the first batch of prototypes using the water retort. As one of four machines developed by DOST under the “Roll-out of DOST-developed Food Processing Equipment to the Regions through the Food Innovation Centers (FIC)” program, the water retort processes liquid food through pasteurization and sterilization.

Pasteurization kills organisms that cause food to spoil yet has nil effect on food quality. On the other hand, sterilization ensures cleanness of the product following commercial standards.

Other machines include the spray dryer, which transforms liquid products to powder instantaneously; vacuum fryer, which fries food at low temperature; and freeze dryer, which prolongs food freshness.

Director Azanza explained, “DOST initiated establishment of FICs nationwide. ITDI as the Central FIC functions as overseer.” The Central FIC currently serves as facility for product prototyping and market sample preparation, as well as source of expert assistance in food regulatory requirements compliance.

“Free trade policies either in the ASEAN region or other trade blocs is exerting pressure on our MSMEs to be competitive in all business aspects,” Azanza added. “Thus



ITDI Director Maria Patricia V. Azanza (2nd from right) explains to DOST Secretary Mario G. Montejo (3rd from right) and PCIEERD Executive Director Carlos Primo S. David (4th from right) the process of developing product prototypes from product concepts.

ITDI, as Central FIC, intends to become the source of new and advanced technologies and techniques in food processing, food quality, and food safety evaluation. Dynamic business and marketing strategies are today's buzz words.”

Six regional FICs are presently located in academic institutions that offer food science and related courses “to enable our MSMEs to take

DOST 10 FIC in Mindanao University of Science and Technology; and DOST 11 FIC in the Philippine Women's College - Davao Campus.

200 products out of 2000 concepts

“What we are doing is development of new product lines. Our approach is integrative. We rely on various learnings from food, engineering, and other natural sciences while linking these to the cultural modifications of our target groups. The results are product prototypes that offer high degree of being commercialized,” Director Azanza said.

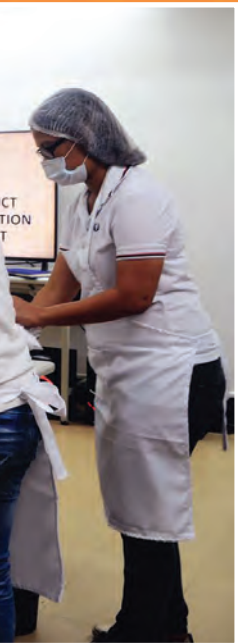
She added that ITDI is targeting to develop 50 prototypes from 500 product concepts or 200 by 2,000 using the four machines.

“What makes the program different is that these food product ideas will better utilize raw

“This is indeed a lucky day for us. It is truly exciting to see this spread of new food prototypes for our project on 200 by 2000 Prototypes of Product Concepts.”

advantage of their research capability,” she added.

The regional FICs are DOST II FIC in Cagayan State University; DOST NCR FIC in the University of the Philippines - Diliman Campus; DOST VI FIC in Guimaras State College; DOST VIII FIC in Eastern Visayas State University;



materials available in the regions. We are capitalizing on the projected increased demand for these; it underlines the way in which the program can boost a more aggressive regional agri-food trade flows," she expounded.

The 63 newly disclosed product prototypes include variants, plus those "differentiated by raw material cultivars, maturity, added flavors, and packaging types and sizes."

Sweet and savory rice

To elaborate, ITDI developed 648 product concepts for healthy, rice-based drinks and shakes, and Ready-To-Eat sweet and savory rice porridges. These were sterilized using the water retort machine at 116-121°C. Four rice cultivars, namely, black, red, brown, and Sung-Sung rice served as base for 26 variants of rice milk shake and drink.

"We certainly enjoyed working on these prototypes," Director Azanza said. Selected fruit flavors were added to plain rice shake and drink, namely, melon, Indian mango, Pico mango, Carabao mango, pineapple, ube, langka, dalandan, buko pandan, and avocado.

ITDI also added six coffee variations (condensed milk, vanilla, coffee, chocolate, mocha, and cappuccino), five banana varieties (saba, cavendish, lakatan, señorita, and latundan), three tea varieties (Oolong tea, green tea, and black tea), peanut butter, and coconut. These will be commercially available soon in stand-up pouches, 250mL bottle, and 750mL bottle.

Not wanting to waste the rice starch by-product from rice shake and drink production, ITDI's team branched out. This resulted in

ITDI developed 648 product concepts for healthy, rice-based drinks and shakes, and Ready-To-Eat sweet and savory rice porridges. (Photo Credit: DOST-PCIEERD)

32 product concepts on Ready-To-Eat sweet and savory porridges. Available in convenient doypacks, their long shelf-life makes these suitable as emergency rations.

Sweet porridges are available in cocoa as champorado and in coconut milk as ginataan. Ginataan variants include yellow and white corn and green, yellow, and white mongo.

Savory congee lists two goto variants, namely, plain tripe and tripe with calamansi and fish sauce. On the other hand, arroz caldo is available in four variants including plain duck meat and plain quail meat. Also available are duck meat with calamansi and fish sauce and quail meat with calamansi and fish sauce.

Red and green hot berries

At 100°C ITDI pasteurized 54 product prototypes of chili oil, sauce, and paste from red and green siling labuyo (*Capsicum frutescens*). These were the results of 288 product concepts.

Flavors stemmed from the infusion of the red chili oil and green chili oil with anchovy,



garlic, onion, chili oil, and chili toyomansi. Also used were bagoong balayan, bagoong alamang, ginger, garlic, onion, and chili sauce.

"Thus far, we are very satisfied with the turnout of our initial product presentation. What could be more fitting than to end our activity with a 'thank you' for inspiring us in our continued effort to support our MSMEs," Director Azanza ended, adding that the next product presentation will feature concepts and prototypes from the spray dryer.



PCIEERD Executive Director Carlos Primo David and staff sample product prototypes of chili oil, sauce, and paste from red and green siling labuyo. (Photo Credit: DOST-PCIEERD)



The knee implant's three components (Photo by Henry A. de Leon, S&T Media Service, DOST-STII)



Editha de Guzman shows her knees a few weeks after her knee replacement surgery. (Photo by Gerardo Palad, S&T Media Service, DOST-STII)



The patient's pre-operative photo (Photo courtesy of Orthopaedic International Inc.)

Happy knees

New surgical system shows why it's more fun in the Philippines

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

EDITHA DE Guzman had, for about seven years, struggled with knee arthritis which limited her mobility and caused her excruciating pain in the last year. When she was in Canada where one of her daughters lives, she wouldn't go out with her friends and instead just stayed home watching TV. Mornings were especially trying as she struggled to get up from bed with difficulty. In the middle of the night, she would wake up to answer nature's call but had to crawl all the way to the bathroom, as she didn't want to wake up any of her children.

But a trip back to the Philippines to have her knees checked changed everything. She learned she had to undergo knee replacement operation for both her knees. The cost, however, was too expensive.

World-class technology developed by Filipinos

Until she learned of another option: the Axis Knee Replacement System, the only one of its

kind in Southeast Asia, and which has been in the Philippine market since July 2015.

With funding by the Department of Science and Technology-Philippine Council on Health Research and Development (DOST-PCHRD), the Axis Knee Replacement System was developed by a team spearheaded by internationally renowned surgeon Dr. Ramon B. Gustilo from Negros Occidental. The team is composed of Filipino, American, Japanese, and Chinese specialists.

A knee implant basically has three components: the femoral (thigh) component made of a highly polished metal alloy, the tibial (shin) component made of polymer sometimes held in a metal tray, and the patellar (knee cap) component which is also made of polymer. A well-designed knee implant can last up to 20 years.

During surgery, the surgeon cuts off damaged cartilage and bone from the weight-bearing surfaces of the knee and replaces them

with these artificial parts. They should be well aligned with the mechanical axis of the leg.

“Axis means that the system achieves correct positioning of the implant components in relation to the mechanical axis which is the line from the center of the hip joint to the center of the knee to the center of the ankle,” explained Dr. Gustilo.

The Axis Knee Replacement System is made of similar materials as other knee systems sold in different countries around the world. Yet, it has many features that make it unique from existing systems, which Dr. Gustilo and his team believe will give better patient satisfaction and outcome.

Among these is the instrumentation. “These refer to a set of instruments used to guide the surgeon to make the proper cuts in the bone, so that the knee implant components would fit over these cut surfaces of the bone and at the same time, they would be properly aligned with respect to the mechanical axis,” said Engr. Jude L. Sasing, a member of Dr. Gustilo’s team.

The system consists of three trays of instruments – more than 50 instruments all in all – in contrast to imported knee systems which consist of six to nine trays of instruments. “They’re like hand tools – one of them looks like a hammer, another looks like a pair of pliers, while another looks like a cutting block with slots where you insert the saw blade used for cutting the bone,” said Engr. Sasing as he described the Axis Knee System instrumentation.

Among these instruments is the Mechanical Axis Finder, a portable, cost-efficient, and reusable device which locates this imaginary line called the mechanical axis. In many hospitals around the world, a computerized navigation technology is used to locate the mechanical axis. Only a few hospitals in the Philippines have this equipment. Computerized navigation systems also cost more than P20M and add at least P20,000 to the total cost of surgery.

Another feature of the Axis Knee System is a novel surgical technique called “Soft Tissue First Technique” that takes full advantage of the unique instruments. This new technique involves ligament balancing before cutting bone. The instruments and technique guide the

surgeon to achieve optimal implant alignment for each patient.

Meanwhile, knee implants imported from the United States and Europe cost between P100,000 to P120,000. While the materials are the same, their local counterpart costs about P60,000 in government hospitals and P70,000 in private hospitals.

“The salaries of our engineers is one reason [for the cost efficiency],” explained Dr. Gustilo. “In the States, aside from the fact that you can manufacture knee implants, the cost in hospitals is too expensive.”

The product is manufactured by Gustilo’s Orthopaedic International, Inc. (OII) with Engr. Sasing himself as its President. Based in Cabuyao, Laguna, OII is an ISO 13485-certified facility which has been designing, developing, and manufacturing orthopedic products including trauma, spine and joint replacement systems, for the past 20 years. ISO 13485 represents the requirements for a comprehensive quality management system for the design and manufacture of medical devices.

“The market right now is global,” stressed Dr. Ilustre I. Guloy, Jr., chairman of Asian Hospital and Medical Center’s Department of Orthopedic Surgery. “So it doesn’t matter whether it is made in the Philippines or in Vietnam or in China because manufacturing is really made globally. What’s important is whether you comply with standards and are ISO certified.”

Dr. Guloy is also a member of Dr. Gustilo’s team of surgeons and engineers who conceptualized and developed the knee system.

“We are proud to say that the conceptualization is all Filipino engineers, doctors, with consultants from US, China, and Japan,” added Dr. Guloy, “but this is a Filipino venture.”

Successful operation

Thus last February 17, 2016, de Guzman underwent operation for both knees performed by Dr. Guloy.

“When I woke up, there was no pain,” she recalled. It stayed painless the next morning. After one week, she was already climbing the stairs at the hospital and shortly after, she went malling with her daughters the whole day.



Dr. Ramon Gustilo, chairman of OII who spearheaded the development of the Axis Knee Replacement System. (Photo by Henry A. de Leon, S&T Media Service, DOST-STII)



Dr. Ilustre I. Guloy, Jr., chairman of Asian Hospital and Medical Center’s Department of Orthopedic Surgery and member of the team which developed the Axis Knee Replacement System. (Photo by Gerardo Palad, S&T Media Service, DOST-STII)

She can now do the things she used to do like cooking, doing the laundry, and going to the market, among other things. She can even go to the beach now.

“Hindi mo maramdaman na may bakal sa loob. Parang normal lang. (It doesn’t feel that there’s something inside. I just feel normal).”

The only problem is she still finds it difficult to stand up by herself which, Dr. Guloy said, is natural. He said that with therapy, the problem will go away in due time. She receives therapy three times a week, aside from the medications for the first two weeks after the operation.

Leap of faith for de Guzman family

As of April 2016, there have been 61 cases of Axis Knee Replacement surgeries in the Philippines.

Editha de Guzman is one of Dr. Guloy's latest patients. Initially, she and her children Tess, Jojo, Mavic, Cesar Jr., and Cecil had misgivings about it, considering that it is a new surgical technique and is a lot more cost-efficient than imported knee implants.

"Nangayayat ako sa kakaisip. Minsan nga hindi ako nakakatulog. Sabi ko, 'Bilhan niyo nalang ako ng wheelchair kasi natatakot ako. O kaya pa injection-an niyo na lang ako (I thought about it a lot, I grew thin. Sometimes, I couldn't even sleep. I said, 'Just buy me a wheelchair because I'm scared. Or let me have the injection),' she told her children who started researching about the Axis Knee System on the Internet.

Their initial apprehension then turned into approval upon learning that the Axis Knee System uses the same materials as knee implants made abroad and the people who developed it are from UP and are acclaimed doctors. As a last push of encouragement, Cecil told her mom, "Sige na Nanay. Yung pera napapalitan. Yung Nanay, hindi. (C'mon mom, money can be replaced, but not you.)"

Thus, they turned to Dr. Guloy for the knee replacement procedure. It was "a leap of faith," as Cecil termed it.

Achieving goals

Editha de Guzman's goal and that of her children and seven grandchildren has been achieved.

"Napakalaking ginhawa itong pagkaka-opera sa akin talaga (The knee operation has given me such a huge relief really)," de Guzman said.

She plans to go back to Canada this June and be ready to go out with her friends in Winnipeg once again. She's also planning a trip to the Holy Land before the end of the year.

"This is really life changing. What we were trying to avoid is when her mobility becomes very limited and then she will get depressed," Cecil revealed. "So now she's no longer irritable. The old Nanay is back."

System for near-zero combustion of biomass

By **ADELIA M. GUEVARRA**
S&T Media Service, DOST-ITDI

THE INDUSTRIAL Technology Development Institute (DOST-ITDI), through its Chemicals and Energy Division (CED), in coordination with DOST Region VII has initiated pilot testing of a 100 kw/hour capacity fluidized bed gasification system (FBGS).

A grant from the Engineering Advancement Association of Japan or ENAA, the machine was acquired early on under the newly rehabilitated project "Wood Waste/Agriwaste for Power Generation."

CED started re-establishing its FBGS to enhance its research and development activities on energy since May 2015. DOST VII, on the other hand, has joined the effort to reuse the equipment and has secured the participation of Raw Brown Sugar Milling Company, Inc. (RBSMCI) in Dumaguete City, Negros Oriental as test partner.

"We want to determine the results of a commercial experience such as what RBSMCI is undergoing," clarified Apollo Victor O. Bawagan, supervising science research specialist at CED and team leader of the FBGS project.

With the science of fluidization being more than 180 years old, many questions regarding its operating performance parameters still remain unclear. As an engineering principle in which solid matter is converted into gas, its application over the decades for a variety of purposes including gasification of high ash coal and fuel oil continues to be of interest to many.

The gasification of biomass, however, such as sugarcane bagasse and sugarcane trash in Negros Oriental, appears to most efficient energy advocates as the most interesting sector for industrial development and use of FBGS.

This is largely because biomass is a sustainable source of alternative energy. With near-zero combustion, the synthetic gas or syngas produced during gasification promotes use of a higher quality of fuel or energy.

In essence, agri wastes are "burned" when a limited amount of oxygen or air is introduced into the FBGS to produce carbon dioxide and energy. This drives a second reaction that converts further waste material to hydrogen and additional carbon dioxide; this is the gasification stage.

While many groups adhere to the belief that waste gasification is just another form of incineration, it has several advantages over ordinary incineration or direct burning of biomass as follows:

Gas cleaning from combustion exhaust pipes may be performed faster and easier on syngas instead of the much larger volume of gas from exhaust pipes after ordinary combustion;

Gas turbines powered by FBGS may generate electric power much economically and more efficiently than powering these turbines through steam cycle used in incineration; and

Chemical processing from gas to liquid of syngas may produce other synthetic fuels instead of electricity.

Atty. Alejandro Florian O. Alcantara, president and CEO of RBSMCI, figures that use of FBGS would be most useful in supplying their electric power requirement.

"I see several advantages to powering our turbines with syngas produced by ITDI's FBGS. These are 100 percent reduction of our agricultural wastes, production of our monthly electricity requirement at no cost, and significant reduction of gaseous pollutants due to the near-zero combustion process of FBGS," Atty. Alcantara said.

RBSMCI produces nearly 1,100 tons annually of muscovado sugar. Pure, whole, and unrefined, it is produced from fresh sugarcane juice without use of bleaching agents.

"Our muscovado sugar is available in powder, syrup, rock, and cube forms. These are mainly sold in the Visayas and Mindanao Regions, Japan, Korea, Taiwan, Hong Kong, and Europe. We also produce cane vinegar and plan to produce rum and biodegradable food containers in the next few years," Alcantara added.

Meanwhile, Bawagan reckons that the results of the project from RBSMCI's commercial standpoint would provide valuable data as to the variety of biomass and waste-derived feedstocks that can be gasified.

Industrial use of FBGS using wood pellets and chips, plastics and aluminium, municipal solid waste, other agricultural and industrial wastes, sewage sludge, and other crop residues still remain to be explored.



Trends show that preference for healthy and nutritious alternative foods and beverages is levelling up. Recognizing this trend, the Department of Science and Technology develops the rice milk, offering a healthy alternative to soya, almond, and cow's milk drink, and a new addition to the beverage industry's product line.

Rice milk for a healthy, nutritious alternative beverage

By DELIA DELICA GOTIS

S&T Media Service, DOST-ITDI

There is never a dull moment inside the DOST-ITDI food research and development labs. Food researchers and technologists never stop in their quest for new and better food products. Recently, they developed the rice milk, a beverage that the health-conscious, young and old alike, are likely to enjoy.

Led and motivated by ITDI Director, Dr. Maria Patricia V. Azanza, a food technologist herself, the research team is relentless in exploring the many benefits of our country's agricultural produce, one of which is rice.

Using one of the DOST- developed food processing equipment called the water retort, the team was able to process rice into milk drink and shake.

"These newly developed rice milk drink and shake products are among the many food product prototypes being developed under the DOST Food Innovation Centers (FICs) established nationwide starting April 2015," Azanza explained. "And we also hope to recognize the most innovative products."

She added that the project also aims to train food product development teams and

develop at least 2,000 product prototypes using the DOST- designed and developed food processing equipment.

The developed rice milk products were successfully launched early this year at the DOST Main FIC in ITDI, with DOST Secretary Mario G. Montejo in attendance, together with other officials and employees. Again on April 12, 2016 during the DOST Science Nation Tour in Pulilan, Bulacan, the rice milk drink and shake, along with the other developed food product prototypes, were presented to the public. During the taste tests, the ITDI team received positive comments.

The DOST rice milk is made from the cultivars/base of red, brown, black and glutinous (malagkit) rice. To prepare, the rice is mixed with water, boiled, blended, homogenized, bottled, and pasteurized at 80 to 90 degrees Celsius using water retort.

Pasteurization (or heat processing a liquid or food) kills the disease-causing bacteria. This makes the food safe to eat, thereby reducing the transmission of

diseases, such as typhoid fever, tuberculosis, scarlet fever, polio, and dysentery.

To twist and perk up the taste of rice milk, the team added other flavors such as mango (e.g., ripe carabao and pico); banana (saba, cavendish, latundan, lakatan, senyorita); coffee (cappuccino, mocha); and chocolate.

Rice milk, like soya and almond milk, does not contain lactose or cholesterol, making it good for the heart and appropriate for the lactose-intolerant. It can also be fortified with calcium, niacin, vitamins B12, A, and D for added nutrition. If rice milk is to be used as substitute for cow's milk, more calcium- and protein-rich food should be consumed as rice milk contains less of these nutrients.

For inquiries on food product development/processing technologies, interested individuals may contact Engr. Norberto Ambagan, chief of the Food Processing Division of the Industrial Technology Development Institute at telephone no. 837-2071 local 2187 or visit www.itdi.dost.gov.ph.



**Prof. Fortunato T. de la Peña,
USec “Boy” to those
who know him as
former undersecretary
for S&T Services,
is back as
DOST’s top man.**

De la Peña, former DOST undersecretary is now science chief

By **RODOLFO P. DE GUZMAN**

S&T Media Service, *DOST-STII*

AFTER A rigorous process of screening for the next head of the Department of Science and Technology, President Rodrigo R. Duterte appointed former DOST Undersecretary Fortunato T. de la Peña to the top post.

De la Peña is no stranger to the science agency as he spent a great number of years at the DOST in different capacities and retired from the service as Undersecretary for S&T Services just last year. The unassuming and soft-spoken public servant was appointed Undersecretary in May 2001 and was instrumental in implementing different programs during his stint that saw the flourishing of high-impact projects that benefited various stakeholders involved in enterprise development, education and scholarship, technology transfer and innovation, and health research and many more.

De la Peña started his career in government service as the head of the Planning Services Division of the National

Science and Technology Authority, the forerunner of DOST, in the early 1980s. In 1989, de la Peña was appointed director of DOST's Technology Application and Promotion Institute and stayed there for three years.

In between his stint at the DOST, de la Peña assumed different positions: at the University of the Philippines, first as Vice President for Planning and Development, then as interim Executive Director for two years; served at the APEC Center for Technology Exchange and Training for Small and Medium Enterprises and was a former president of the UP Alumni Engineers, Philippine Institute of Chemical Engineers, and trustee of the UP Engineering Research and Development Foundation among others.

One of the strengths of de la Peña is his managerial skills on top of having two degrees: one in Chemical Engineering and another in Industrial Engineering from the University of the Philippines. He obtained special training certificates of doctoral studies in business

administration also from the State University and graduate studies in Operations Research from the Polytechnic Institute of New York. He also earned a diploma in Industrial Quality Control from the Boucentrum International Education in Rotterdam in the Netherlands.

In one of his previous pronouncements, de la Peña underscored the importance of finding solutions by properly identifying the problem.

"Solving a problem requires concrete decisions and relevant solutions. Examining the nature of the problem helps in formulating the steps to be undertaken in arriving at appropriate solutions. Taking all the angles of a certain issue makes me more confident in providing solutions because the things involved are well taken and evaluated," said de la Peña.

As an academician, de la Peña had presented papers in local and international conferences in the areas of e-governance, technology management, small and medium enterprises and regional cooperation specifically for the Association of Southeast Asian Nations, Asia Pacific Economic Cooperation, and the United Nations Educational, Scientific and Cultural Organization.

De la Peña has had his share of awards where he earned recognitions like the Philippine Productivity Movement Service Award, UP Gawad Chancellor and the Professional Regulatory Commission Outstanding Professional Award.

As a strong believer in the power of science and technology, expectations are high but de la Peña stands tall with his wealth of experience that will surely propel him to achieve even more accomplishments as he returns to public service. Equipped with more than talent, expertise, professionalism and vision, the new science chief is poised to bring more positive changes in a world of constant change by harnessing the power of science, technology and innovation.



New DOST Secretary Fortunato T. de la Peña confers with his predecessor, former DOST Secretary Mario G. Montejo.



1

1) NRCP President NS Gomez (left) with NSSL President, Dr. Vijaya Kumar, and SCJ Secretary General, Dr. Hiroshi Yoshino.



2

2) NSSL President Kumar (left) hands over the SCA flag to NRCP President, NS Gomez which officially marks the Philippines' hosting of the 2017 SCA.

3) SCA Management Board Meeting with Executive Director Marieta Bañez Sumagaysay and President, National Scientist (NS) Edgardo D. Gomez as principal representatives of the Council.



3

PH to host 17th SCA Conference

By JOSELITO A. CARTECIANO

S&T Media Service, DOST-NRCP

THE PHILIPPINES, through the National Research Council of the Philippines (NRCP), will host the 17th Science Council of Asia (SCA) Conference in June next year. The Conference will be participated in by delegations of renowned researchers and scientists from 31 academic institutions and organizations of the 18 member countries across Asia.

NRCP President and National Scientist Edgardo D. Gomez and NRCP Executive Director Dr. Marieta Bañez Sumagaysay officially received the SCA flag in a simple turnover rite during the 16th SCA Conference

last May 30 – June 1, 2016 at Colombo, Sri Lanka.

Immediate Past President and concurrent SCA President Prof. Vijaya Kumar turned over the SCA presidency and the country-hosting post to NRCP President Gomez during the gathering.

The conference, with the theme Science for the People: Mobilizing Modern Technologies for Sustainable Development in Asia, served as the venue for scientific exchange and cooperation among Asian scholars.

"In 2017, the science congress will particularly focus on the efficient and effective application of science, technology, and innovation in reinforcing inclusive growth and development, providing equitable and better opportunities for all economic players on the gains of economic growth and development," NRCP President Gomez added.

Last June 2010, the Philippines hosted the 10th SCA Conference through NRCP which was then led by NRCP Immediate Past President and SCA President, Dr. Jaime C. Montoya and NRCP President Alvin B. Culaba.

Artist speeds up furniture production thru lumber dryer

By **RIZALINA K. ARARAL**

S&T Media Service, *DOST-FPRDI*

NICCOLO JOSE, a Filipino artist who specializes in projects made from recycled Philippine hardwood, is the proud creator of various remarkable pieces of furniture. He is also the owner of studio 10.10, an art and design company which focuses on one-of-a-kind furniture pieces, large art projects, and crafted interiors. He likewise co-owns Green Canyon, the country's first Eco and Art Resort.

From 2012 to early 2015, Niccolo dried his raw materials using diesel-fired mobile lumber dryer developed by the Department of Science and Technology – Forest Products Research and Development Institute (DOST-FPRDI).

"The FPRDI dryer sped up our time for seasoning wood from four to six months to three days to five days only, resulting in greater productivity," he said.

"As productivity increased, more recycled wood was used, from 400 board feet to 2,500 board feet a month; new raw materials such as fallen trees, roots, twigs, and branches were tapped; and our creations expanded from custom furniture only to custom-built interiors and limited edition art pieces. Our market grew, from Batangas to include Manila, Pampanga and other provinces," he added.

With a background in Environmental Studies, sculpture, and five years of working in theatrical productions in the U.S., Niccolo is an eco warrior who hopes to influence many Filipinos with his love for both nature and the arts. He says not a single tree was cut for any of his masterpieces as each of them is made from reclaimed and upcycled wood, mostly between 50 to 300 years old.

In working with a variety of wood ages, he noticed that even if the wood was quite old, it still required a dryer as there was still a bit of moisture in the material that could lead to movements and cracks in resulting products.

Niccolo has mounted three solo art exhibits so far. During the 2015 APEC summit, he was invited to display his collection of sculptural rocking chairs, and was the only artist featured in the International Media Center. "All my shows were greatly helped by the use of the FPRDI lumber dryer," he says.

According to FPRDI's Senior Science Research Specialist Engr. Ruben A. Zamora, "The Institute's lumber dryer has been serving the country's wood-based and related industries for four decades now. Kiln-dried wood is achieved by artificial drying using a kiln, which is like a very large oven."

"DOST-FPRDI offers an affordable yet effective kiln-dryer that lowers the moisture content of lumber to the intended level. Fuel for the dryer may either be agro-forest wastes or gas, like in the case of Niccolo's company," he adds.

"Wood tends to shrink or swell if not dried thoroughly," explains Zamora. "Distortion or warping can cause problems especially when wood is used as beams and trusses, or in furniture pieces where each part should fit perfectly. Kiln-dried wood may be more expensive, but it is more economical than 'green wood' or air-dried wood in the long run."

"Kiln-drying, combined with proper wood preservation and the right choice of species, makes wood less vulnerable to attacks of termites and powder-post beetles," he points out. "It can extend the material's service life to at least 10 years more."



FPRDI aids wood treatment plant rehab

By **RIZALINA K. ARARAL**

S&T Media Service, *DOST-FPRDI*

DENIK WOOD Enterprise, one of the country's largest wood treatment companies, recently braced up its production by rehabilitating its plant in Matalam, North Cotabato through the support of the Department of Science and Technology's Forest Products Research and Development Institute.

According to For. Catalino Pabuayon, "Company owner Rennilo Ordinario asked our help because of problems he encountered while treating the raw material for his wooden pallets. The chemicals were not penetrating the wood completely and some parts of his vacuum treatment facility had broken down."

Pallets are platform devices that hold one or more cargo packages in a group, allowing a load to be transferred and stored as a unit. Along with forklift trucks, pallets make it easier to ship and store all sorts of commodities around the world. The surge in the demand for local wooden pallets began with the onset of globalization in the 1990s.

"Denik Wood Enterprise has been making wooden pallets for almost 20 years now, and has always made sure that its products are either heat or vacuum-treated," says Pabuayon. "This is in compliance with the International Standards For Phytosanitary Measures No. 15 or ISPM 15.

"ISPM 15 requires concerned companies to sterilize wood materials used to transport products between countries so as to prevent the international spread of disease and insects that can adversely affect plants and ecosystems. Failure to conform to the directive means that the packaging material will not receive the crucial seal from the International Plant Protection Convention," says Pabuayon.

Denik Wood Enterprise uses as much as 65,000 board feet of wood a month from industrial plantation species and supplies wooden pallets to some of the country's biggest fruit exporters.



www.bbslumber.com

Samar Island journalists hone science reporting in DOST workshop

By **FRAMELIA V. ANONAS**

S&T Media Service, DOST-STII

CALBAYOG CITY IN SAMAR GETS SMART-READY FOR DISASTERS | Director Richard P. Burgos (second from right) of the Department of Science and Technology – Science and Technology Information Institute (DOST-STII) turns over the hazard map of Calbayog City and the Reference for Emergency Disaster (RED) Book to Calbayog City Mayor Ronaldo P. Aquino (rightmost). Assisting the turnover are (from left) STII's Dr. Aristotle P. Carandang (extreme left) and Project NOAH's Mariano Raphael B. Reyes. The hazard map shows areas prone to usual hazards (floods, earthquake, etc) so that the local government can identify risky as well as safe areas for evacuation. The map can also be used for urban planning reference. The RED Book, meanwhile, is a handy reference on how to's during disasters. The turnover was part of the "Science for Resilient Business and Government Services" seminar-workshop held at the Calbayog Cultural Convention Center March 29, 2016. Organizers of the workshop were DOST-STII, Radyo ng Bayan – Calbayog, and the Calbayog City Tourism Office. (Framelia V. Anonas, S&T Media Service, DOST-STII)



JOURNALISTS FROM the various provinces in Samar Island recently sharpened their writing and broadcasting skills even more by adding science-based dimensions in their reportage.

Particularly, the Samar Island scribes learned how to consider the science behind the factors affecting reading and listening.

First, the scribes were told not to be afraid to ask questions. "Science is all about asking questions, so don't be afraid to do so," said resource person Timothy James Dimacali, science editor of GMA news online. "Scientists are people too."

Further, since science is already challenging, writing science should simplify complicated concepts.

"Break up a big idea into smaller ideas," Dimacali advised. "Use an analogy or metaphor to help make it understandable."

Veteran radio announcer Mario Garcia of PTV-4 also reiterated this even as he advised the journalists to "talk simple, write simple; simplify anything complicated; and explain terminologies clearly."

In the event of disasters, Garcia advised broadcasters, "Don't say 'don't panic' because people will panic even more."

Moreover, Dimacali advised the journalists that a good science story doesn't necessarily have to answer a question.

"Science doesn't have all the answers, which is why scientists always ask questions about the world," he said. "You can make readers question their own beliefs, or help them form questions of their own about the things around them."

Meanwhile, Garcia, reminded the journalists that, "your stories should inspire" in addition to the usual functions of journalism which are to inform, educate, and entertain.

To reinforce the advice and pointers they learned from the resource persons, the participants prepared a broadcast scenario simulating a disaster event. Garcia later shared his observations on how the participants can further improve their way of reporting a 7.9-magnitude earthquake without causing panic while maintaining truthfulness in their facts.

Dr. Aristotle P. Carandang, division chief of the Department of Science and Technology's Science and Technology Information Institute, also advised the journalists that in cases of disasters, broadcasters should always inform their listeners on what they should do to prevent harm and casualty. "This is the science behind responsible reporting of disasters," he said.

Participants in the online reporting writeshop also got vital pointers from Dimacali on how to sharpen their articles.

"We have already learned some of these things in college but it's nice to have a fresh perspective again," said Ninfa B. Quirante of the Philippine Information Agency-Samar.

DOST-STII organizes science journalism writeshops to help communication students and professionals improve their writing and broadcasting skills and encourage them to specialize in science communication. Partnering with DOST in this seminar are the local government of Calbayog City, Calbayog Tourism Office, DYOG-Radyo ng Bayan, and the National Grid Corporation of the Philippines.

Vietnamese journalists observe DOST's best practices in S&T info development and promotion

By **RODOLFO P. DE GUZMAN AND JADE G. VILLANUEVA**

S&T Media Service, *DOST-STII*



Shake Table | Truong Quynh Lien (left), deputy director of Center for Science and Technology Communication of the Ministry of Science and Technology of Vietnam and head of the delegation, together with her colleagues, try the Earthquake Simulator known as the “shake table” to experience the kind of ground shaking during earthquake up to magnitude 7.0 or 8.0. (Photos by Henry de Leon/ Texts by Rodolfo P. de Guzman, S&T Media Service)

A GROUP of 10 Vietnamese journalists recently visited several DOST offices to observe and learn how the Department offices develop and promote science and technology (S&T) information.

The Vietnamese delegation was led by Ms. Truong Quynh Lien, deputy director of the Center for Science and Technology Communication (CeSTC) of the Ministry of Science and Technology (MOST) of Vietnam. The delegation was composed of reporters from different organizations. Aside from CeSTC, the media visitors represented Radio Voice of Vietnam, Vietnam News Agency, People's Army Newspaper (official organ of the Ministry of National Defense of Vietnam), Tuoitre Newspaper (Organ of Ho Chi Minh Communist Youth Union), and Sai Gon Giai Phong Newspaper (organ of People's Committee of Ho Chi Minh City).

The institutional visit aimed to “learn from the experience(s) of the Philippines in developing science and technology communication,” as

mentioned in the official letter from Vietnam's MOST.

Welcoming the delegation were STII Director Richard P. Burgos; Communication Resources and Production Division (CRPD) Chief Dr. Aristotle P. Carandang; Information Resources and Analysis Division Chief Alan C. Taule; and the entire STII workforce. Also present during the opening program was Dr. Carol M. Yorobe, Undersecretary for Regional Operations and designated Officer-in-Charge, Office of the Secretary, DOST.

The three-day activity was slated for the delegates to visit DOST agencies and projects in Bicutan, Los Baños, and Quezon City science communities to impart and underscore the importance of S&T communication in amplifying the Department's mandates and functions.

At STII, the guests were oriented on STII's various communication projects and strategies. Later, they also toured the Technology Application and Promotion Institute and were acquainted with technology promotion and commercialization in the Philippine setting.

Then the group hopped on a guided tour at the Science Education Institute which impressed upon the guests the role of the Institute in S&T manpower development. Capping Day One visit was a ride on the Automated Guideway Transit – one of DOST's flagship projects developed by the Metals Industry Research and Development Center.

The following day, the team hied off to the Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development, and DOST IV-A which gave the guests a great view of the mountains and the countryside. There they were acquainted with the various services and programs of PCAARRD and DOST IV-A.

On the third day, the guests toured the Philippine Science High School Main Campus



where they were introduced to the workings of the SMART classroom.

At PAGASA and PHIVOLCS, the Vietnamese guests observed our meteorologists and geologists on weather forecasting and earthquake monitoring.

The PAGASA visit started off with a short briefing about PAGASA, the services provided by the agency and its different functions. The group got a glimpse of the action inside the Weather Forecasting Division amidst sophisticated computer systems and manual computations using different models like those from the Japan Meteorological Agency (JMA) and the United States Geological Services (USGS).

Fake journals alert

By **FATIMA M. MONCADA**

S&T Media Service, *DOST-STII*

THE INTERNET has made a lot of things easier. Unfortunately, these include the creation of a new breed of predatory system of which Filipino scientists and researchers should be wary.

In a symposium on predatory journals and conferences held recently at Hotel Jen in Pasay City, Dr. Fidel R. Nemenzo (Vice-Chancellor for Research and Development at the University of the Philippines Diliman) raised the issue of hijacked journals-- fake journals that steal the identity of legitimate ones to trick scientists and researchers into submitting their research articles.

"They ride on the prestige of legitimate journals, they solicit paper submissions, and they collect publishing fees through fake websites," detailed Dr. Nemenzo. He added that the websites used by hijacked journals are usually more visually attractive than the legitimate websites. This makes it possible for scientists and researchers to fall for the bait.

Consequently, good research will be tainted with bad reputation when published in bogus publications.

"The problem with this is that research results that are published in both hijacked journals and predatory journals are now finding themselves into research literature...So just imagine the ripple effect of this contamination of legitimate research by fraudulent research that are published in these journals that do not screen paper submissions," said Dr. Nemenzo.

To prevent getting victimized not only by hijacked journals but by other types of predatory journals and conferences as well, Dr. Nemenzo advised the scientific community to exercise due diligence. He mentioned a number of red flags that scientists and researchers should look out for such as high acceptance rate, faulty grammar in website content and formal letters, aggressive solicitation, and rapid publication among others.

Dr. Nemenzo also cited a number of online references that list legitimate journals such as the Directory of Open Access Journals (www.doaj.org) and the Open Access Scholarly Publishers Association (www.oaspa.org). Meanwhile, he cites the Beall's list (www.scholarlyoa.com) which identifies potential, possible, or probable predatory journals and publishers that scientists and researchers should avoid.

However, Dr. Jose Florencio F. Lapeña of the University of the Philippines Manila, one of the reactors in the symposium, said that caution should still be observed when using whitelists and blacklists. He explained that there are journals listed in the Beall's list that are actually legitimate and journals indexed in whitelists that are predatory in nature. "No list is infallible," he said.

Hence, to better equip the Filipino scientific community with the capacity to discern the good from the bad, Dr. Nemenzo and Dr. Lapeña, along with other reactors in the symposium namely, Dr. Jose Maria Balmaceda (University of the Philippines Diliman), Dr. Franco Teves (Mindanao State University – Iligan State University), and Dr. Evelyn Mae Tecson-Mendoza (National Academy of Science and Technology), have all agreed that information drive should be the first step to take. Dr. Tecson-Mendoza further emphasized that it is especially important that the younger generation of Filipino scientists and researchers be informed about the dangers of predatory journals and conferences and how to avoid them.

The symposium was organized by the National Academy of Science and Technology, an attached agency of the Department of Science and Technology, in partnership with the University of the Philippines Diliman.

The Vietnamese journalists also visited the station of the newly launched DOSTv, the Filipino Weather Channel, administered by DOST-STII. DOSTv was on its test broadcast inside the PAGASA facility.

The group proceeded to the PHIVOLCS office where they were welcomed by Director Renato U. Solidum, Jr. Soon they had a briefing on what PHIVOLCS is and its functions by Mylene Villegas, chief of the information and communications division.

Director Solidum toured the visitors in the different monitoring facilities of the agency for earthquake,



Kanlaon Volcano Briefing |

PHIVOLCS Director Dr. Renato U. Solidum, Jr. (right) explains the characteristics of Kanlaon Volcano, the history of its eruption and the damages it caused in the past.



PAGASA Weather Monitoring |

Truong Quynh Lien (2nd from left) and her colleagues are given a briefing on the weather monitoring and forecasting of PAGASA which gave them a peep into how meteorologists work to come up with weather bulletins.

tsunami, volcanic eruption and other geohazard events manned by highly trained Filipino geologists.

Director Solidum handed over to Truong Quynh Lien a copy of the Broadcaster's Manual for Emergency and Disaster Preparedness which serves as a guide for broadcasters to properly and effectively disseminate disaster information.

"We are very thankful to STII and other DOST agencies for showing us what they do to provide information to the public, and we learned a lot from this experience. We also look forward to strengthening our partnership with DOST in the future," said Truong Quynh Lien (as translated from Vietnamese).

Brunei, Philippines win in int'l tilt for the gifted in science

By **JESSA JAEL S. ARANA AND MARK JAYSON E. GLORIA**
UPLB



Brunei Darussalam's Team A was hailed as the over-all champion in the 5th ASEAN Plus Three Junior Science Odyssey (APTJSO) on June 18 at the DL Umali Hall, UPLB. The team won first place with a total score of 79.83 points while the Philippines occupied the second and third spots after its Teams A and D earned a close 79.19 points (silver medal) and 78.7 points (bronze medal), respectively.

THESE FINAL placements were computed based on the accumulated points of each team from competitions in laboratory assessment skills in biology, chemistry and physics; poster presentation; and project pitching that were held from June 13-17 at UPLB.

Brunei Darussalam's Team A dominated the over-all laboratory assessment skills competition, where it also emerged as the highest point-earner in the physics category. The Philippines' Team A ranked highest in biology laboratory assessment, while Chinese Taipei's Team A brought home the gold medal in the chemistry category.

On the other hand, People's Republic of China's Team A bagged the gold medal for the paper presentation, followed by Indonesia's Team A and South Korea's Team A.

For project pitching competition, where the teams were reshuffled into 12 groups, the Apitong Group was declared as first place winner with its proposal on an eco-friendly device using Microbial Fuel Cells that would measure and record air temperature in the rainforest. In second place was the Anahaw Group that promoted a system to help seeds germinate and grow by exposing them to magnetic fields, white light and controlled temperatures. Placing third was the Almaciga Group who proposed the use of laser sensor to detect disturbance and monitor water pressure in the rainforest.

Present during the awarding ceremonies were Chancellor Fernando C. Sanchez, Jr.; Dr. Rowena Christina L. Guevara, undersecretary for science and technology services of the Department of Science and Technology (DOST); Dr. Josette T. Biyo, director of the DOST-Science Education Institute; Prof. Yong Tai



Lee of the ASEAN+3 Center for the Gifted in Science; and Dr. Alexander A. Lim, science and technology division head of the Sectoral Development Directorate of ASEAN Economic Community Department of the ASEAN Secretariat.

Chancellor Sanchez expressed his hopes that the event had given the participants an enriched understanding of climate change and the rainforests, and developed a renewed appreciation of the environment and a deeper understanding of the work done by scientists for climate change adaptation and mitigation.

Dr. Guevara also said that she wished that the participants were inspired to help the environment in simple but meaningful ways in their day-to-day living through the APTJSO. Prof. Yong Tai Lee, who referred to the participants as gifted young scientists, urged them to use their scientific talents to preserve nature at this age of climate change.

Meanwhile, Dr. Lim presented future initiatives and activities of the ASEAN Plus Three Center for the Gifted in Science (ACGS) in which the ASEAN countries can come together again for the advancement of scientific knowledge. He also announced that Vietnam will be the host country of the next APTJSO.

Dr. Biyo, as head of the organizing body for the 5th APTJSO, thanked everyone who helped make the event a success, including UPLB and the entire Los Baños science community. She also reiterated the importance of the event in line with climate change adaptation and mitigation. "By letting you experience the role of rainforests in climate change, you will be huge advocates from hereon of climate change adaptation and mitigation," she said.

Also present during the event were Dr. Portia G. Lapitan, vice chancellor for academic affairs; and Dr. Jose V. Camacho, Jr., dean of the Graduate School.

The 5th APTJSO is a six-day education event that allows gifted students from the Asia Pacific plus three countries to interact with experts in climate science and put their scientific skills to test with their colleagues. This year's theme, "Climate Change and the Rainforest," served as anchor for the competition's activities.

Started in 2010, the APTJSO is an annual educational event in the field of science and technology for young students between 13 to 15 years of age. This event is designed specifically to develop the gifted and talented young individuals in the field of science and technology and to nurture scientists and engineers.

Moreover, the competition aims to stimulate student's intellectual curiosity through various experience and experiments, and encourage them to excel in S&T. Further, despite the highly competitive nature of the APTJSO, it actually provides students the opportunity to foster friendship and networking in the region.



INTERNATIONAL STUDENTS PLANT TREES IN MAKILING | Participants in the 5th ASEAN Plus Three Junior Science Odyssey or APTJSO climb up the Makiling Botanical Garden in the University of the Philippines Los Baños for a tree planting activity as their own little way of helping Mother Earth cope with climate change. The 5th APTJSO, with the theme "Climate Change and the Rainforest," is an annual international competition among the youth who are gifted in science. Contestants come from countries in the ASEAN region plus Sweden, Korea, and China. "Most of the kids have not been to the forest or the real rainforest, so this is time for them to experience what it is like to be in the forest," Ruby Cristobal of Department of Science and Technology - Science Education Institute said. "At the same time (the activity enables the student) to contribute to enriching this resource, which is slowly being affected by climate change." (Photo by Gerry Palad/ Text by Ma. Lotuslei Dimagiba, S&T Media Service, DOST-STII)



TASTE OF THE FILIPINO CULTURE | The teacher-participants and observers of the 2016 ASEAN Plus Three Junior Science Odyssey (APTJSO) get a taste of the Filipino culture during their Amazing Race activity at the Forest Club Eco Resort in Bay, Laguna. The participants eagerly tried the dance of *tinikling* and the game of *kadang-kadang*, tasted *laing*, learned a few Filipino words, and played the folk song *Leron-Leron Sinta* by tinkering with regular bottles. The 2016 APTJSO ran from June 13 to 18 at the University of the Philippines Los Baños, where 26 teams of 12 to 15-year-old students, gifted in science, convene once a year to learn and experience more about science and foster camaraderie and networking in the APT region. (Photos and text by Geraldine B. Ducusin, S&T Media Service, and University of the Philippines Los Baños)

The lessons of

DOST-PHIVOLCS
S&T Media Service

Pinatubo eruption

***The Department
of Science and
Technology
-Philippine Institute
of Volcanology
and Seismology –
(DOST-PHIVOLCS)
commemorates
the 1991 Pinatubo
Eruption on its 25th
year this June 15***

dev.redmagisterial.com

THE PINATUBO eruption is considered one of the largest eruptions of the 20th century.

On June 15, 1991, Pinatubo Volcano spewed a 40-kilometer ash column above its summit called the Plinian eruption. Then came a 12-16 kilometer zone of pyroclastic flows—the hazardous and dangerous high velocity mixture of hot gases, steam, fragmented rocks and ashes that caused nearby cities to be enveloped in total darkness.

The thick ashfall that accumulated and made heavier with rainwater from Typhoon Diding (International Name: “Yunya”) caused roofs of houses to collapse.

The ashfall affected not only Luzon Island, but also reached as far as the Indian Ocean. The eruption had also caused global temperatures to decrease by about 0.5°C temporarily from 1991 through 1993.

The volcano shook with smaller but still dangerous ash eruptions in the early part of September 1991. Due to the magnitude of the eruption, Pinatubo Volcano’s original summit caved in, creating a new crater that was almost two kilometers wide. This new crater was later filled with water, forming a lake months after the eruption.

From July to September 1992, a lava dome formed in the new crater as fresh magma was quietly effused out of Pinatubo Volcano. This dome has since been submerged with the continuous increase of the lakewater level.

The hazardous effect of the 1991 Pinatubo eruption continued for more than five years in which still hot and thick pyroclastic flow and ash deposits were remobilized by monsoon and typhoon rains. This resulted in a rapidly flowing thick mixture of volcanic materials and water also known as lahar. Several major lahar flows buried many towns and villages, including huge



Subic Naval Base in Zambales in the aftermath of the Mt. Pinatubo eruption

upload.wikimedia.org

agricultural lands thus affecting the livelihood of the communities.

Prior to the June 15, 1991 eruption, initial signs of restiveness of Pinatubo Volcano started in April 1991 as reported to PHIVOLCS by residents living in the western flank (Zambales area). PHIVOLCS immediately installed a temporary seismic station in Poon Bato, Botolan, Zambales, and with the assistance of the U.S. Geological Survey (USGS), a Pinatubo Volcano Observatory (PVO) was set up in Clark Air Base to study and monitor the activities of the volcano.

A team of scientists from PHIVOLCS and USGS collaborated to produce hazard maps that were disseminated to local authorities, and Volcano Alert Signals were issued to the Office of the President; the national, regional, and provincial disaster coordinating councils; and the media. The alert signals enabled PHIVOLCS to inform the public of the volcano’s activities and advise the people on risks and safety measures. Proper coordination of these agencies and institutions, and right forecast of the 1991 Pinatubo eruption resulted in saving at least 5,000 lives.

The eruption affected more than 249,000 families, displacing Aeta or Negrito tribes who lived on the volcanic slopes. The Office of Civil Defense recorded 847 dead, 184 injured, and 23 missing persons. Properties, agricultural lands, water ways,

and infrastructures were damaged. The Ninoy Aquino International Airport in Metro Manila was also closed for four days.

Pinatubo Volcano is straddling the boundaries of Pampanga, Zambales, and Tarlac, and is part of the chain of volcanoes that lies in the central portion of the Zambales Mountain Range. According to radiometric age dating, Pinatubo Volcano’s last eruption prior to the 1991 eruption occurred about 400 years ago.

On the 25th year of the 1991 Pinatubo eruption, PHIVOLCS encourages everyone to look back and remember not only the tragedy, but also the lessons we learned. Awareness and preparedness would increase our chances against natural hazards and disasters. Through the continuous monitoring, and Information, Education, and Communication (IEC) campaign of PHIVOLCS, let us keep our communities safe from and resilient to volcanic eruptions, earthquakes, tsunamis, and other related hazards.

For more information contact:

Dr. Renato U. Solidum, Jr.

Director

Philippine Institute of Volcanology and Seismology

PHIVOLCS Bldg., C.P. Garcia Ave., UP

Diliman Campus, Quezon City

Tel. No: (02) 926 2611 or

(02) 426-1468 to 79

www.phivolcs.dost.gov.ph



DOST Secretary
Mario G.
Montejo opens
the first DOST
Technology
Transfer Day

Market day for DOST technologies

By **LAWRENCE M. SAN DIEGO**

S&T Media Service, *DOST-TAPI*

With its widely lauded economic upswing in recent years, the Philippines, through the Department of Science and Technology (DOST) is sustaining this stellar growth by maximizing homegrown science, technology and innovation. This expectedly boosts the country's competitiveness in a highly globalizing and fiercely competitive marketplace.

The DOST's strategy to achieve this is to partner with the private sector, particularly

through technology transfer, where researchers, inventors and innovators can effectively transfer knowledge, processes and outputs of technologies to desired end-users.

To realize this on a grand scale, the DOST brought together various businesses, enterprises and industry players last April 27, 2016 at the Sofitel Philippine Plaza Manila for the Department's first Technology Transfer Day. More than a showcase of 'Filipinnovations', the DOST Technology Transfer Day became an interactive venue

for companies and investors to seize opportunities to capitalize on proudly Filipino technologies that are ready for adoption in the market.

With the theme "PROMISE: Promoting Research and Outstanding Milestones in Innovation and Science for Entrepreneurship," the event served to bridge business and science communities through technology transfer and build partnerships for innovation-driven industries and technopreneurship.

Through the event, DOST was able to bring to the fore

More than a showcase of “Filipinnovations”, the DOST Technology Transfer Day became an interactive venue for companies and investors to seize opportunities.

the “immense promise and potential of these technologies in giving local industries the boost they need to compete in a highly globalized market, and delivering breakthroughs relevant to the nation’s quest for inclusive and sustainable development,” according to DOST Secretary Mario G. Montejo.

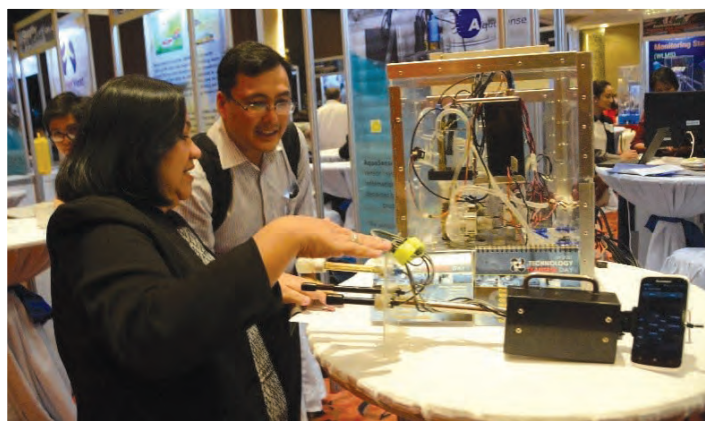
“Through technology transfer, the DOST has delivered innovative solutions for businesses and institutions to address technical challenges in improving product or service quality, developing human resources, minimizing costs and enhancing outputs in production, acquiring equipment and facilities, and other operations and management-related activities,” Secretary Montejo said during the event’s opening rites.

Aside from a number of inquiries on Filipino technologies in the areas of agriculture, industry,

countryside development, healthcare, environment and disaster risk management, participating companies also expressed interest to partner with technology developers to try and test their innovations and products in the market.

Among the 70-plus innovations featured at the DOST Technology Transfer Day include nanotechnologies in developing biofertilizers and nano-coating for high-value fruits to extend shelf life after harvest; diagnostic devices for viruses affecting shrimp; product and process development for various Filipino food specialties, including rice, mango, cocoa, cassava, goat meat and highly nutritious snacks; local eco-friendly transport technologies such as the DOST-developed mass transit system and hybrid electric road train, as well as Charging in Minutes (CharM) – a rapid charging system for electric vehicles;

machineries and processes for improving products made from local textiles, wood, bamboo and abaca to help spur enterprises in the countryside; locally developed weather data sensors to help in weather forecasts, climate-smart farming and flood warnings; Eco-Sep or Eco-Friendly Septic System that uses organominerals in wastewater treatment; Axis Knee System, an affordable high-quality knee replacement system; and Biotek-M, a highly accurate diagnostic tool for early detection of dengue. (To learn more about all the Filipinnovations showcased at the Technology Transfer Day, download the booklet at www.tapi.dost.gov.ph.)



Proudly Filipino technologies are showcased at the first DOST Technology Transfer Day to participants from the private sector.



George T. Barcelon, president of the Philippine Chamber of Commerce and Industry, delivers his message at the opening rites of DOST Technology Transfer Day.

MAIN FEATURES

MARKET DAY...FROM PAGE 27

To ensure a government-led technology transfer pathway that is both responsive and proactive, the DOST set in place policies and programs for protecting and managing Filipino intellectual property and developing commercial potential of local technologies.

During the event, the DOST, through its Technology Application and Promotion Institute (TAPI), introduced its fast-tracked process for issuing a fairness opinion report—a key requirement for licensing and negotiating financial terms for government-funded technologies.

The Fairness Opinion Boards convened by TAPI evaluated 14 licensing transactions during the day. Ten of these applications were recommended as “fair” on the same day, while the remaining applications will be further evaluated. More than 20 companies also expressed interest to pursue licensing of technologies in future talks and meetings.

The event also hosted partnership signings between

DOST-Food and Nutrition Research Institute and the Department of Social Welfare and Development for the latter’s Sustainable Livelihood Program; between the DOST and MRAIL, Inc. for an in-depth viability study of the Hybrid Road Train; and between TAPI and Landbank of the Philippines for the I-TECH (Innovation and Technology) Lending Program for Filipino Inventors.

Fairness opinion reports of technologies were officially turned over to the University of the Philippines and Manila HealthTek for Biotek-M; and to DOST Advanced Science and Technology Institute and Alexan Incorporated for the Advanced Remote Data Acquisition Unit or arQ, a core technology for ASTI’s weather stations.

Royalties from local technologies were also handed over from Orthopaedic

International Inc. to the DOST-Philippine Council for Health Research and Development for the Axis Knee System; and from Heritage Veterinary Corporation to DOST-Industrial Technology Development Institute for the mosquito ovicidal/larvicidal or OL trap.

To learn more about Filipino technologies spearheaded and supported by the DOST, visit www.dost.gov.ph and www.tapi.dost.gov.ph.



The DOST Technology Transfer Day hosted the partnership signing between (clockwise) DOST-TAPI and Landbank of the Philippines for I-TECH (Innovation and Technology) Lending Program for Filipino Inventors; DOST and MRAIL, Inc. for an in-depth viability study of the Hybrid Road Train; and DOST-FNRI and the Department of Social Welfare and Development for the latter’s Sustainable Livelihood Program



Royalties were handed over from the Heritage Veterinary Corporation to DOST Industrial Technology Development Institute for the mosquito ovicidal/larvicidal (OL) trap (left); and from Orthopaedic International Inc. to the DOST Philippine Council for Health Research and Development for the Axis Knee System.



Fairness opinion reports were officially turned over to University of the Philippines Manila and Manila HealthTek for Biotek-M, a diagnostic technology for early detection of dengue; and to DOST-ASTI and Alexan Incorporated for the Advanced Remote Data Acquisition Unit or arQ, a core technology for ASTI’s weather stations.



Liquid nanocomposite food coatings can be sprayed or brushed on high-value fruits like mango and *papaya* to prolong post-harvest shelf life. The edible coatings are developed from bio-materials extracted from pineapple crown leaves and mango peel.

Bioteck-M kit is used as a highly efficient confirmatory test for diagnosis of dengue infection within the first five days of illness, with results in an hour or less.



The DOST has developed textile technologies for indigenous Filipino fabrics using improved weaving processes and advanced application techniques of natural dyes



Eco-friendly transport solutions developed by the DOST include the Automated Guideway Transit System (left) for rapid mass transit and the hybrid electric road train (right)



Locally developed weather data sensors help in weather forecasts, climate-smart farming and flood warnings.



The DOST helped in product and process development of various Filipino food specialties, including rice, mango, cocoa, cassava, goat meat and highly nutritious snacks (Clockwise from top left: nutritious rice-mongo curls, ready-to-eat goat meat in pouches, cassava cookies, and mango juice with nata de coco.)

Let's Shop!



DOST's Industrial Technology Development Institute technologies are now ready for transfer.

DOST- ITDI technologies are now in the market



Monascus purpureus whole cell laboratory scale color production technology

The technology uses two improved strains to produce food colors, one using rice substrate and the other using aqueous media with heat- and moisture- modified starch.

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

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



Freeze-dried avocado using the freeze dryer

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



Advantages and characteristics of freeze- dried avocado:

- Requires no preservatives
- Healthy and nutritious
- Preserved aesthetic, functional, nutritional, and organoleptic properties
- Maintained material structure
- Improved product stability during storage
- Good rehydration characteristics



Carrot chips using vacuum fryer

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

Advantages/characteristics of vacuum-fried carrots:

- High quality since there is minimal loss of properties (e.g., color, flavor, nutrients)

- Reduced fat absorption
- Contains less oil than conventionally-fried carrots
- Requires no preservatives
- Crispy
- Healthy & nutritious



Powdered egg albumin using the spray dryer

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

Advantages and characteristics of powdered egg white:

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



Emergency Food Reserve (EFR)

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

Advantages and characteristics of EFR:

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



Chili oil using water retort

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

Advantages and characteristics of chili oils:

- Build up appetite
- Shelf-stable
- No sophisticated equipment needed
- Use locally available raw materials



Mango flakes

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

Advantages and characteristics of drum drying/mango flakes:

- Reduces risk of



degradation of the product during storage

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

MAIN FEATURES



Exciting food products that are rarely found, if at all, in commercial establishments are now ready for adoption.



FUTURE FLAVORS

Innovative food products show big market prospects

By FRAMELIA V. ANONAS

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

Various kinds of foods and flavors developed through science and technology intervention give food lovers and developers wide prospects for innovation in food products, and provide entrepreneurs huge opportunities for business.

Filipinos, being citizens of the world, have acquired various tastes for various local and international food and have undoubtedly become more adventurous gastronomically. This gives food experts much opportunities to come up with enhanced food products with very good quality and broad use, such as complementary and emergency food.

Moreover, various disasters have also sent food experts thinking of ways to develop food items that can supply the nutritional needs of victims and can be stored and distributed without much issues.

A wide variety of such innovative food products were showcased recently during the Technology Transfer Day held recently in Hotel Sofitel, Pasay City. Organized by the Department of Science and Technology, the Technology Transfer Day provided opportunities for technology developers and adoptors, including those in the food industry, to find technologies that are ready for takeovers.

The exhibit section aptly called "Future Flavors" paraded most DOST-developed or funded food products, providing instant taste tests and treats to willing participants.

Among the foods on display and were up for taste and adoption were:

Ready-to-Eat arroz caldo:

Categorized as disaster food ready to eat without drinkables, this arroz caldo (porridge) was developed as a disaster mitigation/relief food to address immediate hunger of disaster victims. It has a shelf life of at least one year. The packaging structure is lightweight and very handy. It was designed to withstand aerial distribution of about 800-1000ft for the distribution in flooded areas or in disaster zone that cannot be reached by land because of damages.

Complementary foods:

These are protein and energy food products made of rice-and-mongo combination, in instant, ready-to-cook, and crunchies versions. Complementary foods are designed to fill the nutritional needs of small children aged 6 months to two years old.

Cassava cookies and cassava chips: Made of 100 percent cassava grates, these gluten-free goodies provide a healthy fix for people with sweet tooth. The cassava chips are ready to fry, perfect for movie or tele marathon snacks.

Thermally processed instant laing: This canned laing comes as a complete dish made of gabi (taro) leaves cooked very slowly

in coconut milk and seasoned with ginger and chili for zing, and shrimp paste for unique salty flavour.

Nipa sugar and sweetener:

This is an alternative kind of sugar that contains minerals and has low glycemic index. It can also be used as sweetener and ingredient in several foods and confectionery products such as pastries and native delicacies.

Iron fortified rice: This is an enriched kind of rice made from a blend of iron rice premix or ordinary rice grains coated with iron using suitable solvent and binder.

Stabilized brown rice: This brown rice has a lengthened shelf life of up to nine months with its original taste intact. This stability was developed through a combination of heat treatments.

Food Innovation Center products: These food products include vacuum-fried tahong (mussels), okra, squash, jackfruit, durian, pineapple, calamansi, tomato, bagoong and sea grapes, and freeze-dried pineapple.

Said showcase of innovative food products and other technologies was one of the highlights of the celebration of the Technology Transfer Day to commemorate RA No. 10055 or the "Philippine Technology Transfer Act of 2009" which provides the framework and support system for the ownership, management, use, and commercialization of intellectual property generated from research and development funded by the government.



Wines made from local fruits gained much interest among the audience.

“Now we will see Filipinos using Filipino guitars, made of local woods, and made by Filipino luthiers.”

-Prof. Nathan Neil V. Manimtim
College of Music, UP Diliman

Gitara ni Juan

A harmony of music, science & culture

By **KARL RAVEN A. RAMON**
S&T Media Service, DOST-STII

In the days of yore, *harana* (serenade) used to be the means of expressing a lad's love and admiration to a dainty lass. Aside from the singer's baritone or tenor, the sound quality of the guitar helped much in encouraging the lady's family to open the house and let the serenaders in.

If only DOST and UP were already “best friends” at that time, maybe our *lolo* (grandfather) Juan would be more successful in serenading our *lola* (grandmother) Maria.

But starting 2014, the UP College of Music, UP College of Electronics and Electrical Engineering (EEEI), and DOST-Forest Products Research and Development Institute, with funding from DOST-Philippine Council for Industry, Energy and Emerging Technology Research and Development, did a harmonious performance that raised the bar of the guitar-making industry in the country.

Gitara ni Juan Development of Prototype Design and Standardization of the Guitar-making Process for Quality Classical Guitars Using Select Philippine Woods, is a project that began last December 2014 and completed

PROTOTYPE 0
THE FIRST PROTOTYPE USING LOCAL
WOODS



TEAM GITARA NI JUAN. (From left): Eva Cadiz and Mylene Untalan, Bernice Go (musicologist), Engr. Adel Sta. Maria, Prof. Nathan Neil V. Manimtim, Engr. Ivan Reyes, Engr. Crisron Lucas, William Alama (one of the official luthiers of Gitara ni Juan), and Virgilio Liboon. (Photo by Allan Mauro V. Marfal, S&T Media Service, DOST-STII)



in May 2016. According to project leader Asst. Prof. Nathan Neil Manimtim of the UP College of Music, the project aimed to come up with a standard procedure that can be used by Filipino luthiers (guitar-makers) to build quality and affordable classical guitars using Philippine woods.

Gitara ni Juan also desired to help our ordinary guitar makers to improve their craftsmanship, use of technology, and their livelihood in producing local guitars. The project also wanted to give Filipino classical guitar players access to quality and yet affordable classical guitars made in the country.

A symphony of talents and skill

Bernice Go (musicologist), Ivan Reyes, Andrew Aragon and Adel Sta. Maria (engineers) did the research part while the prototypes of Gitara ni Juan were crafted by William and Jayson Alama, both from Dauin, Negros Oriental. The former are the official luthiers of Gitara ni Juan.

Meanwhile, DOST-FPRDI identified and selected the species of wood with the quality needed for guitar-making. There are 3,000 species of wood that are appropriate for the project, according to FPRDI.

Due to low capital of small-time luthiers, they mostly rely on plywood as their main material to make guitars, compromising the quality of the guitar. Mainstream Pinoy guitar makers use jackfruit, narra, and blackwood ebony. Imported guitars are made of spruce, cedar, and rosewood which are considered as hard woods that ensure durability and quality sound but these are costly.

Birth of Gitara Ni Juan

The search for Philippine wood species suitable for stringed musical instrument was first studied in 1989 by Dr. Emmanuel D. Bello of the

UPLB-Department of Wood Science and Technology, College of Forestry. This was followed by the papers of Engr. Josephine Carandang of DOST-FPRDI during the '90s which were later lobbied to UP Diliman's College of Music Dean Dr. Jose Buenconsejo and Associate Professor of EEEI for further studies. Then it was funded by the DOST-PCIEERD under Executive Director Dr. Amelia P. Guevara and to be monitored by Engr. Ermie M. Bacarra, chief of Human Resource Institute and Development Division.

It was first called "Juan Guitar" and later modified through DOST-PCIEERD's

MAIN FEATURES



suggestion of adding “ni” to strengthen their claim that the product is for every Juan.

Gitara ni Juan’s mission

Gitara ni Juan indeed aims to tune up a lot of things, which include:

The industry: Because of the dying Pinoy luthiery because of imported guitars that are more durable and have better quality, the team envisioned to help boost guitar-making industry starting with the grassroots and backyard luthiers. They advocate education to luthiery as a way to strengthen the awareness and enthusiasm on guitar-making in the Philippines.

“Para sa Pilipino ‘to, hindi ito para sa malalaking negosyante,” Prof. Manimtim said when asked about the profitability of Gitara ni Juan outside the country. “Gawing accessible ito sa as many Pinoy luthiers as possible,” seconded Engr. Crisron Lucas, also of the project team. Reviving the guitar industry through Gitara ni Juan can thus lead to additional jobs.

Tradition and craftsmanship: Gitara ni Juan is not just a flash idea to promote the guitar industry. Its designs and approaches were traced back from history. Musicologist of Gitara ni Juan, Bernie Elaine Go, conducted qualitative research on the playability of several guitars that were used a hundred years ago. Her research included historical data concerning all guitars, including foreign guitars.

To preserve the guitar’s heritage, designers and engineers based their





GITARA NI JUAN CONCERT. (Foreground, L-R:) Attorney Jumadla, Prof. Manimtim, Erwyn Vibal, Dr. Rowena Cristina L. Guevarra, Engr. Lucas, Engr. Reyes, and UP Prof. Lester Demetillo as performers in the said concert. (Photo by DOST-PCIEERD)

blueprint on the results of their quantitative research on traditional handmade guitars. Engr. Reyes mentioned “artwork sya by artist, it’s not a tool used by mathematicians, merong intrinsic value.”

The environment: The Gitara ni Juan team sought Forester Robert Natividad and Engr. Josephine P. Carandang of DOST-FPRDI to act as their consultant regarding the species needed for the production. To make sure that the forest will be safe with the emergence of Gitara ni Juan, For. Natividad prescribed that the species for guitars should be fast-growing and sustainable, and situated in plantations and common lumberyards.

Music and science in concert

To showcase the success of the project, the project

team held a concert launch of Gitara ni Juan on May 12 at the UP Diliman College of Music Mini Hall. With 12 prototype guitars, the team held performances that ranged from solo guitar to guitar duet, from guitar with vocals to guitar with other musical instruments like double bass, violin, and even piano. In the final performance, the 12 guitars were played to give life to *Danzas de Panama* (1953) composed by Wiliam Still and arranged by UP Professor Lester Demetillo.

Performers were Prof. Manimtim himself, music arranger and UP Prof. Demetillo, the UP Guitar Orchestra and other musical performing groups in UP, and guest singer Attorney Anne Mariae Celeste Vios Jumadla who belted “Still Loving You” popularized by the Scorpions.



Selected music aficionados, DOST-PCIEERD officials, UP College of Music personnel, and National Artist for Music Dr. Ramon P. Santos attended the concert launch of Gitara ni Juan.

DOST-PCIEERD Executive Director Dr. Carlos Primo C. David said in his message during the concert, “I’m starting to believe that there is no monopoly of innovation, that innovation is not actually just for science and engineering. Filipinos should know that we are proficient in the arts and sciences.”



IntelISENSE: Making sense of autism using high technology

Text and photos by ESPIE ANGELICA A. DE LEON
S&T Media Service, DOST-STII



Now you can remotely monitor a child with autism to check the child's progress, in real time or on demand.

Sasha, 7, attends a special school for autistic children. While she is in school, her parents who are at home, and her therapist who is in his clinic, can watch Sasha at school – in real time.

Better yet, they can watch Sasha in school yesterday, or the week before, even a month before – thus allowing them to closely monitor her progress or the lack of it.

If her therapist senses that something is wrong with Sasha's behavior, he can then provide her with another intervention that he thinks will better serve the purpose, based on what he saw and heard.

What makes this possible is IntelliSENSE, a project by experts from the De La Salle University (DLSU) in Manila and supported by the Department of Science and Technology's Philippine Council for Industry, Energy and Emerging Technology Research and Development (DOST-PCIEERD).

**IntelliSENSE:
A no-nonsense approach**

IntelliSENSE is a web portal that acts as a progress monitoring tool for children with special needs, or autism in particular.

The child's parents, teachers, school authorities and his therapist can log into this portal and, through the live feed, they can watch and see the child's behavior, performance, and progress in school. As such, IntelliSENSE helps to answer the questions, "Is the treatment working?" and "Is the treatment a good match for the patient?"

Through this technology, they can view not just video recordings of the child.

IntelliSENSE likewise generates reports so that they may also access all the patient's health and school records. These records indicate the results of all the child's activities, therapies, and protocols and their effects. These may be summarized and visualized on a weekly or monthly basis, and may be accessed 24/7. Meanwhile, the videos may also be accessed on demand, with permission from the therapist and the school.

Aside from benefiting the therapist, it also becomes useful for the school officials as they can see for themselves if their programs and activities are appropriate and effective for their students and if their teachers are performing well.

At the same time, the parents themselves are updated on their child's progress. If for example, the child needs

to improve his reading skills, the parent can see through the portal how the reading session is done in school and how they need to reinforce it at home.

By making the parents, teachers, and therapist aware of how the child is making progress, IntelliSENSE thus becomes a vehicle for collaboration between them.

It also solves the problem involved in backtracking through the patient's "paper trail."

According to Jocelynn W. Cu, chairperson of the Computer Technology Department at DLSU's College of

As such, the patient's achievements and progress are hard to track over time, data cannot be visualized, and it is difficult to evaluate therapies and protocols.

The project comes into fruition

Cu narrated that IntelliSENSE stemmed from a PhD class conducted by Dr. Merlin Teodosia Suarez who is the Project Team Leader. In that class, they explored image audio processing which is Cu's area of

Jocelynn W. Cu, chairperson of the Computer Technology Department at DLSU's College of Computer Studies, is one of the brains behind the project.

Computer Studies and one of the people behind the project, the usual scenario is that when parents meet with the therapist, they bring with them pieces of paper documenting the patient's condition. The therapist, meanwhile, has a notebook in hand. "The problem begins when certain situations require a change of therapist," Cu explained. "So now it becomes hard for the new therapist to refer back to the child's past behaviors, treatments and results."

expertise. Eventually, Cu, her husband Gregory who is into hardware infrastructure, and Suarez who is fondly



MAIN FEATURES

called Doc Yamie by her students and colleagues in DLSU, hatched the idea of developing a technology that will better serve those involved in the treatment of kids with special needs, ultimately benefitting the patients themselves.

At about this time too, they invited DOST Balik Scientist Dr. Roberto Legaspi to conduct a class on empathic computing, or affective computing as it is called in other countries. "The big idea is, when you step inside a room for example, when you feel hot, the airconditioning system will automatically be turned on. Or, when it's time to turn on the lights, they will automatically be turned on. Or, when it's time for you to have your cup of coffee, then the coffee maker will automatically start to work," Cu explained. "It's all based on your pattern of behavior. This is the big picture now. This is empathic computing."

Influenced by the idea, Doc Yamie shifted gears and identified the target market for their fledgling project – autism patients. Right away, the trio buckled down to work and

packaged the technology as such. After all, Doc Yamie is not called "the fearless leader" by her DLSU co-workers for nothing. That was between 2008-2009 and now, IntelliSENSE is ready for commercialization.

"It took us several years to develop the technology, [to conduct the] experiments, work with the students, at the same time work on our course requirements," said Cu. "Until we submitted the project to DOST and DOST supported it for three years." DOST preferred projects with commercial value to those which simply entail a lot of research and nothing more, Cu added.

Now that IntelliSENSE is available in the market, the group has been receiving inquiries.

For an installation fee, they will place

A sensor secretly installed in one of the chairs in TALA.



cameras pointed in different directions inside the school room. The purpose is for the cameras to capture images of the child wherever he is inside the room.

They will also install sensors in the chairs but hidden from view. Through these sensors, they would know if the child is sitting or lying down, or if he is leaning against the back rest. They can also determine if there is something else on top of the chair, like the kid's bag.

They will also place speakers, also hidden from view, and other devices namely location sensors and temperature sensors. Location sensors determine



Part of DLSU's TALA Empathic Space

where the child is exactly inside the room, while temperature sensors automatically adjust the room's temperature.

All of these devices are connected to the control center in DLSU which will process all the image and audio data.

The group will provide training for the teachers as well upon installation. Thereafter, the school will have to pay monthly subscription fees.

A testing room cum showroom for IntelliSENSE

Serving as both a showroom and testing room for IntelliSENSE is a facility in

DLSU which Doc Yamie's group calls TALA Empathic Space.

It looks like a regular office, with desks lined up in rows and computers on top of each desk. But as one walks further inside, one will notice a small enclosed area containing colourful kiddie stuff. Immediately outside this enclosed area is the control center which consists of a server and network connections.

True enough, this is TALA. Called the "empathic space" by Doc Yamie's team, it is a child's play area, equipped with the devices involved in IntelliSENSE, including cameras donated by Japanese professors. By using these

MAIN FEATURES

cameras, Cu and her teammates can separate the person's head from the body so they can easily do further processing.

In 2014, Autism Speaks Foundation President Erlinda Borromeo said that the number of people with autism spectrum disorder in the Philippines, and other countries as well, had almost doubled in the previous six years. And the number continues to rise, she said.

Meanwhile, IntelliSENSE has just been introduced to the market but already, the team behind the project are already taking several steps forward to upgrade the technology and up the ante of autism treatment in the country. Given the statistics of autism globally, IntelliSENSE really makes a lot of sense.



Ramiro L. Guab of the PTRI Technical Services Division shows how to use the Warping Machine by manually arranging the coco coir ropes from one steel tubing to the other before putting it in the Geo Loom.

Geo Loom

Weaving geotextile that keeps nature and empowers people

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

Because there is a perceived need for geotextile in disaster mitigation and environmental conservation, the idea of creating the local Geo Loom, the machine that will churn out the geotextile, has become inevitable.

Nature, since the beginning of time, has nurtured life and has given people what they need to live and enjoy life to the fullest. Similarly, the art of weaving has, for centuries, been part of nature, breathing new life to what nature has to offer.

From the fiber that is woven into fabrics for clothing and accessories to different patterns and designs, weaving is part of the web of creation.

Thus nature is interlaced with weaving, and both should be given the freedom to grow and thrive, and be preserved by people.

Science in art

As traditional weaving becomes less and less visible amidst modernization, weaving as an art has survived the test of time and has virtually transformed. It has metamorphosed into a form that is more convenient and suited to the demands of modern life.

By infusing science and technology into the weaving equation, the art and craft has evolved to become more versatile, producing a wide array of products not only as wearing apparel but also as geotextile, an innovative material used for construction, agriculture, and soil conservation.

So what is geotextile?

Geotextile, according to the ASAE (Society for Engineering in Agricultural, Food, and Biological Systems), simply means a “fabric or synthetic material placed between the soil and a pipe, gabion, or retaining wall: to enhance water movement and retard soil movement, and as a blanket to add reinforcement and separation.”

The word “geo” refers to earth and “textile” refers to fabric. Thus, according to ASTM 4439, geotextile is defined as “A permeable geosynthetic comprised solely of textiles. Geotextiles are used with foundation, soil, rock, earth, or any other geotechnical

engineering-related material as an integral part of human-made project, structure, or system.”

In short, geotextiles or geotextile fabrics in woven or non-woven forms are used for the foundation of soil, rock or earth and is an integral part of a manufactured project, infrastructure or system that will strengthen formations and minimize degradation particularly of ground resources.

A stroke of creative innovation

The Philippine Textile Research Institute or PTRI, an attached agency of the Department of Science and Technology, is in fact at the forefront of harnessing the potentials of geotextile in the country using environment-friendly materials such as coco coir that are often discarded as waste. Geotextile is woven using a special machine called the Geo Loom.

The Geo Loom is an example of the many technologies being developed by DOST-PTRI geared at providing solutions to various problems -- a stroke of creative innovation from a team of highly dedicated engineers.

“The disasters that hit the country are coming in different intensities and the geotextile is a very simple, direct manner in which we wanted to convey that the community at their



Celia B. Elumba, director of the DOST-Philippine Textile Research Institute

MAIN FEATURES



Engr. Daniel J. Lavin of the Technical Services Division of PTRI physically inspects the finished geotextile net for consistency and strength—the two important factors in passing the standards set by the Institute.



geotextiles available in the market but these are made of synthetic materials not suited for our domestic need.

“The idea for the geotextile, if you look at the model that we are looking at is really part of the back-to-basics

level can in fact do something about these cases because it is preventive, it can mitigate and can help your situation in cases of disaster management in a very simple manner,” said Director Celia B. Elumba of PTRI.

The geotextile, in the form of nets, are used in agro-forestry where tree seedlings are planted in slopes, river banks, and other terrains prone to soil erosion and siltation. Since the materials used are natural and biodegradable fibers like coco coir, the geotextile developed by DOST-PTRI blends naturally with the environment and becomes part of the land. There are

principle, this is what we call moving the past forward. This is not a major technological innovation but there are little tweaks to make the innovation of a community model and bring it forward to our future needs and requirements,” added Director Elumba.

Rise of the Geo Loom

Because there is a perceived need for geotextile in disaster mitigation and environmental conservation, the idea of creating the local Geo Loom, the machine that will churn out the geotextile, has become inevitable.

The Geo Loom is an innovation of the traditional handloom that can be found in different communities all over the country. DOST-PTRI

engineers, doing research on water hyacinth and during their visits to communities in Butuan, assessed the potentials and limitations of the hand loom. It was during one of their visits to Legazpi, Albay that the PTRI engineers saw how the people from the Bicol region produced geotextile.

“The Geo Loom was patterned after the traditional looms and the basic design is the same but we put in some innovation to make the process easier and less time consuming. We have incorporated the ‘warp beam’ and the ‘cloth beam’ components to the main loom,” revealed Engr. Daniel J. Lavin, Supervising Science Research Specialist and lead engineer of the Technical Services Division of PTRI.

The Geo Loom measures 1.3 meters wide by 3.0 meters long, considered a standard size for such type of loom. Just like the traditional loom, it is manually operated using foot pedals. On the average, a loom weaver can produce a one-meter wide by six-meter long geotextile net in a day. But, depending on the requirement, the Geo Loom can produce up to 20 meters or longer of geotextile net. According to Engr. Lavin, this utility model can be

redesigned to make it bigger or expanded, depending on the application and requirements of the market.

The Geo Loom is made of the same materials as the traditional looms, using local hardwood called lauan or Meranti. This kind of wood, also referred to as Philippine Mahogany, is preferred as material for the Geo Loom because of its strength and durability. These are giant trees abundant in the country and the Asian region with two varieties: the red lauan (*Shorea negrosensis* or *Shorea polysperma*) and the white lauan (*Pentacme contorta* [*Shorea contorta*] or *Parashorea malaanonan*).

“In fact there are looms that are still usable even after 20 years and performs consistently in terms of producing same quality products. Although there will be certain components and parts like screws that need to be replaced, but basically the looms made of lauan could last for many years,” disclosed Engr. Lavin.

Actually the Geo Loom is one component of a bigger project of the DOST-PTRI that includes the twinning and twisting machine and the



warping machine. The twinning and twisting machine, operated manually, is responsible for converting the raw fibers like coco coir into a rope-like material. PTRI also introduced an innovation to this machine -- a traversing spool that moves from left to right and back to ensure a balanced twinning and twisting of the rope. This machine can produce 100-180 meters of rope per hour.

On the other hand, the warping machine is a simple contraption made of a big wooden frame with metal pegs on both sides where the rope-like materials are looped and bundled up manually before it goes to the Geo Loom.

"The Geo Loom is really born out of a need, applying a simple back-to-basics approach, and with innovations in our designs like the traversing method and system resulting in automatic twisting of the twine, we are able to improve productivity thereby empowering our communities," said Director Elumba.

The Geo Loom is versatile because it can generate different kinds of geotextile nets depending on client specification. Engr. Lavin said that the loom can be set

or adjusted to conform to client specifications that can produce 400, 700 and 900 gsm representing the woven pattern that varies in distance between twines/ropes from one inch apart to two inches.

As of this writing, the Geo Loom utility model has already been submitted for patenting and intellectual property to ensure that the design made by DOST-PTRI is protected from copycats.

Weaving a strong future

With the use of science, technology and innovation, DOST-PTRI is on the right track in weaving a strong future for the budding geotextile industry in the country.

Starting with the development of the Geo Loom utility model, the Institute is now providing geotextile testing services to cater to public and private institutions that need to test their materials before using in various projects.

DOST-PTRI started geotextile testing in 2004 using its available equipment for apparels and fabrics. The tests conducted in the facility include thickness, mass per unit area, and breaking strength (grab method).

From just 36 clients served in 2008, the number of clients increased to 98 in 2013, generating an average of 62 percent annual increase.

"The Philippine Textile Research Institute is the only agency in the entire country that offers testing services for geotextiles, these are what we are using for our road work, construction application by the DPWH and the Philippine Ports Authority. The DOST-PTRI is an accredited testing institution. We have seen a 500 percent rise in the testing application for geotextiles, meaning there is a lot of construction going on in the country and this is good news," said Director Elumba.

Indeed, the Geo Loom has made its mark as a precision tool for geotextile and the many initiatives of PTRI have been knitted together to create different fabrics that cover the different aspects of life. In the process of weaving, lives are transformed, communities are empowered, and the weaver of the loom becomes an integral part of an entire world and remains equally significant before as it is today.

To hit its 300-mark target, TAPI has been all-out in promoting and supporting patent applications among local researchers and inventors. Partnering with law firms is one of its latest moves that shows positive results.

Pushing for patent filings

By ENGR. MARIO L. RANCE AND JOY M. LAZCANO

S&T Media Service



DOST-TAPI Edgar I. Garcia (second from right) leads the signing of the agreement between DOST and patent firms that will render several intellectual property services to fast-track patent filing and increase the number of local intellectual property. Also in photo are (from left) Charlene R. Calvelo and Atty. Edmund Jason Baranda of B&A and Caesar Angelito Arceo of DOST-TAPI. (Photo by Joy M. Lazcano, S&T Media Service, DOST-STII)

Sustaining its upward run in the Global Competitiveness Index, the Department of Science and Technology through the Technology Application and Promotion Institute (DOST-TAPI) has tapped three patent law firms to assist in facilitating and expediting Intellectual Property (IP) filings in the country to boost economic activities brought about by technology driven products and services.

The recent agreement between DOST-TAPI and three patent law firms is seen to push upwards the number of patents filed in the country by local firms and individuals and get them approved.

TAPI's partners

With a mandate to provide financial support to Filipino inventors for a complete package of intellectual property rights assistance, DOST-TAPI, through its director Engr. Edgar I. Garcia, signed a MOA with three major IP firms in the country in June this year.



DOST-TAPI Edgar I. Garcia (third from right) with Atty. Editha R. Hechanova (second from right) and Atty. Gladys C. Vichez of the Hechanova & Co., Inc.

Said partners include Hechanova & Co., Inc. headed by Atty. Editha R. Hechanova and Atty. Gladys C. Vilchez; Baranda & Associates led by Atty. Edmund Jason Baranda and Ms. Charlene R. Calvelo; and Sapalo Velez Bundang & Bulilan Law Offices headed by Atty. Ignacio S. Sapalo and Atty. Neptali L. Bulilan.

Hechanova & Co., Inc and SVBB are both top IP filers in the country and were cited as outstanding IP firms in Asia, while Baranda & Associates works in association with international intellectual property law firm Rouse, a leading global IP consultancy that provides full range of IP services.

Republic Act 7459 otherwise known as the "Inventors and Inventions Act of the Philippines", tasks TAPI to assist IP-related services from preparation of specification, filing and prosecution to conclusion of patent application/utility model or industrial design registration.

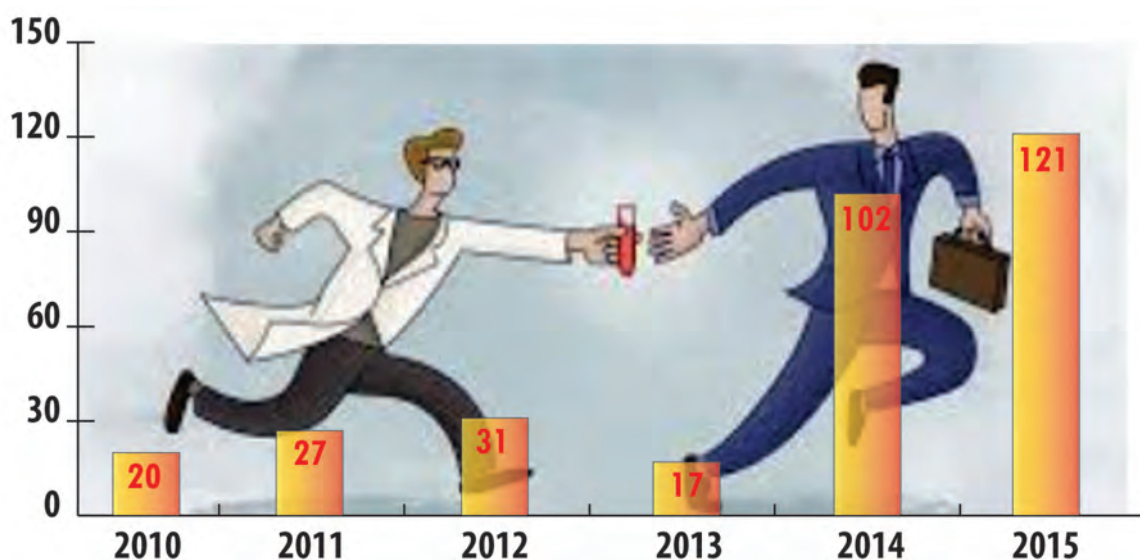
Thus DOST-TAPI continuously seeks partners that can prepare the necessary documents for securing intellectual property protection of its clients' invention/utility model/industrial design.

B & A's Atty. Edmund Jason Baranda is both an

IP lawyer and a qualified Patent Agent with more than 10 years' experience in the Philippines. He has extensive experience in drafting patent specifications, advising on freedom-to-operate searches and prosecuting local and international patent

applications. He is also involved in patent litigation, particularly patent cancellation and patent infringement actions in the pharmaceutical field, and trade mark/copyright litigation.

Meanwhile, Hechanova & Co., Inc., represented by



DOST-assisted patent applications, 2010-2015

Source: DOST-Technology Application and Promotion Institute

Atty. Editha R. Hechanova, is a company that handles trademark and patent prosecution, copyright and domain name registrations, trademark valuation, searches, and other non-contentious intellectual property matters. The firm is also attached with Hechanova Bugay Vilchez & Andaya-Racadio Law Offices.

Likewise, SVBB represented by Atty. Ignacio S. Sapalo, former Director of the Bureau of Patents, is one of the biggest law firms in the country engaged in intellectual property prosecution and enforcement, representing world-wide clients, as well as big multinational companies operating in the Philippines. Included in its portfolio are Microsoft, Toyota, Nestle and some other major global players.



With Atty. Ignacio S. Sapalo (second from right) and Atty. Neptali L. Bulilan of the Sapalo Velez Bundang & Bulilan Law Offices.

The three law offices will assist DOST-TAPI's clients in the preparation of patent documents and prosecution of their intellectual property applications before the Intellectual Property Office (IPOPHL).

Meanwhile, DOST-TAPI also welcomes Atty. Gladys C. Vilchez as TAPI's new IP Consultant that will provide expert opinions on IP matters

and technology transfer activities of the DOST.

IP filings on the rise

The country is currently on the upswing as it leaped once again in the innovation pillar of the World Economic Forum GCI report at 48th place in 2014-2015 report, 16 notches up from the 64th ranking in 2012-2013.

The jump is greatly helped by DOST's initiatives in fast-tracking patent applications among local inventors, scientists, researchers, and university-developed research outputs.

At the present, DOST-TAPI is working on to hit the 300-mark patent applications. Total IP filings as of May this year is 67.

According to Dir. Garcia, the partnership with law firms came out of the need to increase the IP assets of the country which includes patents, utility models, industrial designs, copy rights, and trademarks.

Director Garcia added that patents and technologies are vital to a country's development and that, to move up, the country would need to invest and fast-track technology patents for it to be translated into commercial products or services.



With Atty. Gladys C. Vilchez of Hechanova & Co., Inc.

The World Intellectual Property Organization defines intellectual property as creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names and images used in commerce.

IP, such as patents, copyright, and trademarks, protects people, and enables people to earn recognition or financial benefit from what they invent or create.

Deterrents to IP filing

According to Atty. Neptali L. Bulilan, a senior partner at SVBB Law Firm, filing a patent or a utility model is a very arduous task especially for a scientist or an inventor. He stressed that putting the technology concepts along with the disclosure of its components, and trade secrets on paper eats up so much time.

Aside from that, the prior art search and evaluation of potentially patentable features of the invention up to its eventual publication would take approximately six months for a simple utility model. As such, it will take 18 months at the most for an invention in case there are no further objections from other parties.



With Atty. Edmund Jason Baranda (third from right) and Ms. Charlene R. Calvelo of Baranda & Associates.

He also explained that the protection would only start after IPOPHL has already published the granting of the IP rights to the invention. However, he added that, in the Philippines, the granting of IP protection is given to the party who filed protection first.

According to the IPOPHL, “utility model is a protection option, which is designed to protect innovations that are not sufficiently inventive to meet the inventive threshold required for standard patents application. It may be any useful machine, implement, tools, product, composition, process, improvement or part of the same, that is of practical utility, novelty and industrial applicability.”

Utility model or UM can have seven years of protection under the Philippine law.

Commenting on the science department’s initiatives on IP assets, Atty. Bulilan said that it is “a good move, as it will encourage inventors to pursue more research and development activities.”

He said that filing a patent protection for a socialized price would cost an inventor around P40,000-P50,000. “That is costly especially for an ordinary inventor or scientist,” says Atty. Bulilan.

This is where DOST-TAPI can assist scientists and inventors. The Institute offers

various assistance packages for inventors, scientists, and researchers who are interested to bring their inventions and creative works into the market. Aside from invention contests, the agency provides financial assistance on prototyping and technology commercialization packages on top of the patent assistance.



Bamboo for shelter

By **ALLAN MAURO V. MARFAL**

S&T Media Service, *DOST-STII*

Every year, an average of more than 20 typhoons enter the country, and a number of these result in the claiming of thousands of lives and billions worth of properties.

Displaced and distraught, typhoon victims can only hope for some basic things that can help them bring back hope—food and shelter.

To help victims get back to normalcy, the Department of Science and Technology-Forest Products Research and Development Institute (DOST-FPRDI) together with Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development, developed “Do It Yourself Bamboo Shelter” which is suited to Philippine conditions.



Department of Science and Technology Region VIII Director Edgardo M. Esperancilla leads the turnover ceremony of the Do it Yourself (DIY) Bamboo Shelter at Palo, Leyete. DIY Bamboo Shelter is a cost-effective and easy to build semi-permanent shelter that could provide huge help for the rehabilitation of Typhoon Yolanda-affected areas in the province of Leyete. (Photo by Henry A. de Leon, S&T Media Service, *DOST-STII*)

Because of its characteristics, bamboo is eyed as a promising substitute for timber. In times of calamities, people can depend on its resilience and strength.



Cost-effective and easy to build

According to DOST-FPRDI, the DIY Bamboo Shelter, made of erect bamboo poles, is a low cost and semi-permanent shelter intended to make housing more accessible to the public, particularly to the poor.

The goal of DIY Bamboo Shelter is to serve many Filipinos who cannot afford to build a house made of the usual

materials. For just P75,000 to P150,000, a family can already own one house unit.

Unlike other houses, the bamboo shelter can be acquired instantly. The shelter can be carried by a six-wheeler truck and assembled within three to four days by three to four medium-sized workers with basic carpentry know-how guided by the instructional manual.

Considering the fact that bamboo is a natural insulator, living in a bamboo shelter can be very cool and comfortable. It is also environment-friendly and rust proof.

DOST-FPRDI also pointed out that bamboo is a promising substitute for timber due to its renewability and wide-spread availability. Aside from that, it is cheaper than wood, it has strength properties comparable

to mild steel, making it fit for structural applications.

What's inside the house?

This shelter measures 24 square meters and consists of a living room, kitchen, bedroom, and bathroom. It is also ready for tapping and water utilities. The walls and roofing are also made of bamboo poles. The upper portion of the shelter can be anchored to the ground to support the unit against the strong wind.

Last 2015, DIY bamboo shelter was launched at Tacloban City, Leyte. It aims to help meet the housing needs of Yolanda victims.

DOST 8 Regional Director Edgardo Esperencilla said during the launching that aside from making housing more accessible to the poor, the DIY shelter can also help develop the bamboo industry in the region since there are many bamboo plantations in the northwestern part of Samar and in some parts of Leyte. (Information from DOST-FPRDI)



Want to be sharper? Drink 'Tubig Talino'!

By **MA. LOTUSLEI P. DIMAGIBA**

S&T Media Service, DOST-STII

Tubig Talino will not just make one more intelligent but also wiser in deciding about business ventures.



Worldwide, micronutrient deficiencies are among the most prevalent problems of nutrition.

The most common micronutrient deficiencies of health significance are in vitamin A, iodine, and iron, according to the World Health Organization.

In the Philippines, these three deficiencies are prevalent. As a solution to one of these deficiencies—iodine deficiency, the Food and Nutrition Research Institute (DOST-FNRI) under the Department of Science and Technology came up with and further developed an Iodine-rich drinking water also known as “Tubig Talino.”

“Dati pinag-aaralan namin ito dahil masyadong mataas ang ating problema—prevalence ng iodine deficiency, Iodine Deficiency Disorder (IDD). So noon medyo malaki, one whole Recommended Daily Allowance. Pero nung nagkaroon na ng improvement binaba na natin sa 1/3 kasi for maintenance na lang,” according to Marcela C. Saises, project leader of “Tubig Talino” and senior science research specialist of DOST-FNRI.

“Pag sinabi nating tubig talino or iodine rich drinking water ito, yung tubig. It can be purified water, it can be deep well water. Water works with iodine added to it,” she explained.

The “Tubig Talino” is a refreshing health drink made from distilled or purified or ordinary water mixed with “Water Plus + I₂” or iodine premix solution that may help prevent IDD.

Ms. Saises said the project started in 2008, initially, the “Water Plus + I₂” was available in 5ml sachet or 15ml bottle mixed with 20 liters of water. However, with improvement of technology and change of delivery system, the production of 5ml sachet and 15ml bottle were phased out. “Tubig Talino” was reintroduced in a dispenser form for water refilling stations and processing plants.

Saises shared her concern on having it on sachet or bottle.

“Baka inumin ng direktso o paglaruan ng bata” (It might be drank directly or played with by children) and the packaging equipment is expensive which can cost up to P500,000. This is the reason why it is no longer made available. The dispensing equipment will only cost P35,000 which is safer and can be monitored properly.

Saises said that DOST-FNRI doesn’t sell products but they sell the technology. “We develop and transfer the technology together with the document and training,” she told. She said the technology can be purchased by water stations and processing plants by sending a letter of intent addressed to Dr. Mario V. Capanzana, director of DOST-



The
Dispenser
Equipment

around 35,000 pesos according to Saíses.

She said that the total amount of the technology with dispensing equipment and laboratory can cost 150,000 pesos more or less. "Depende kung gaano kalaki ang gagawin nila."

Saíses advised people to buy the "tubig talino" or iodine-rich drinking water from their clients who availed the technology. Some of the technology adoptors were Beelove, Provincial Health Office of Bataan, Watah

Water in Quirino, Crystal Clear in Tagum City, Blue Petals in Iloilo, St. Martin in Caloocan, Bauco in Mt. Province, Andili-Nueva Visayas Multipurpose Cooperative in Compostela Valley, and Aqua Home Water Station in Marinduque, among others.

She said that they have their own branding but they advise the adoptors to include in their packaging the labels like "with iodine" or "iodine-rich" etc. and the logo of DOST-FNRI can be seen.

Iodine deficiency can have various effects like goiter, increased incidence of stillbirths, abortions and congenital abnormalities, as well as dwarfism. "Maliliit ang mga bata di gaano matangkang," says Saíses.

With proper Iodine intake, "Sa mga bata nagpapatalino [talaga], IQ points [ay] may dagdag," and there are studies that it actually helps, she remarked. That is why she promotes "Tubig Talino" technology be transferred and be commercially available to the public.

FNRI sent to the following email addresses: mvc@fnri.dost.gov.ph or mar_v_c@yahoo.com. She noted that the only pre-requisite is that the clients should already have a water station with proper room for preparation and analysis.

She mentioned that interested companies or individuals who wanted the technology can avail DOST-FNRI's program on the Nationwide Technology Transfer and Commercialization of Food Technologies. It is the Institute's goal to transfer commercially viable technologies to private, government, and non-government organizations in the regions or provinces. She said that DOST-FNRI provides both the necessary technical assistance and consultancy services to successfully setup and operate the water station or food processing plant.

The technology can be availed for 10,000 pesos inclusive of manual, training, mentoring without the equipment. Meanwhile, the dispensing equipment cost



Ms. Trinidad II T. Arcangel, Senior Science Research Specialist of DOST-FNRI and project staff of "Tubig Talino" trains the ANUVIMCO Cooperative personnel in Compostela Valley.



Personnels are trained to weigh and prepare fortificant for Iodine premix.



STARBOOKS eyed for overseas deployment

By **ESPIE ANGELICA A. DE LEON AND KARL RAVEN A. RAMON**
(WITH REPORTS FROM **RODOLFO P. DE GUZMAN AND SUSANA O. ABADA**)

S&T Media Service, *DOST-STII*



DOST-STII Director Richard P. Burgos (foreground) introduces STARBOOKS in the 14th Conference of Philippine Schools Overseas held recently at the Diamond Hotel. Others in photo are Mary Grace A. Tirona , executive director of the Commission on Filipinos Overseas (middle) and Prof. Gerson M. Abesamis, consultant of K to 12 Transition Team of the Commission on Higher Education and senior lecturer of College in Education in UP. *(Photo by Gerardo de Jesus, S&T Media Service, DOST-STII)*

STARBOOKS IS set to step into new territory as it is now eyed to serve as resource for Filipino schools overseas. This was announced recently in the 14th Conference of Philippine Schools Overseas (PSO) held at Diamond Hotel in Manila.

STARBOOKS stands for Science and Technology Research and Academic-based Openly Operated Kiosks - the first digital science library in the Philippines developed by DOST's Science and Technology Information Institute (STII), for areas where Internet connectivity is low or non-existent. It boasts of a user-friendly interface and requires no Internet connection, thus enabling students and researchers to do their assignments and reports even without Internet facility. This digital science library contains tons of science and technology (S&T)-related materials in text, audio, and video formats from local and international sources.

STARBOOKS was identified as an important tool in providing S&T information in the Philippine context to children of OFWs as Commission of Filipino Overseas (CFO) Executive Director Mary Grace A. Tirona mentioned their reintegration into the Philippine educational system, including K to 12, upon their return to the Philippines.

"There are also children of scientists and engineers abroad who are studying in PSOs," DOST-STII Director Richard P. Burgos said. "Thus PSOs are also natural breeding ground for future scientists and engineers. It will be beneficial to these kids if they are already exposed to Filipino content through STARBOOKS in Filipino schools overseas."

PSOs also provide a venue for the teaching and propagation of Filipino culture and heritage among Filipino youth overseas, and serve as a locus for Filipino community activity as stated in PSO's mission. Thus, STARBOOKS's role is parallel with the PSOs' in the aspect of cultivating educational technology while learning the Filipino way.

"We want to disseminate as wide as possible our collection," Dir. Burgos stated. "For us, science and technology information must be shared and disseminated. It's useless if such information will remain in our library."

STII also set up a STARBOOKS exhibit in the said event for the participants to actually explore it.

Other participants in the conference included representatives of Filipino schools

overseas such as those in Hong Kong, China, and Middle East, among others.

"By July, we'll send one of our teachers to bring you our computer to get the software (STARBOOKS) installed," said one of the participants, Directress Gracia Celia Guieb Nickel of the International Philippine School of Shanghai in China.

Growing number of recipients

Meanwhile, STARBOOKS' circle of beneficiaries continues to grow.

Last April 11-13, 2016, a number of schools and public libraries in Quezon received STARBOOKS units for the first time while others acquired updated versions of the digital science library when DOST-STII conducted a STARBOOKS installation and training seminar for recipients at the Manuel S. Enverga University Foundation (MSEUF) in Lucena City.

They were Sacred Heart College, Holy Rosary Catholic School, Maryhill College, MSEUF-Catanauan Campus, MSEUF-Candelaria Campus, MSEUF-Main Library in Lucena City, the Philippine Polytechnic University in Lopez, MSEUF-Basic Education Department Library, Calayan Educational Foundation Inc., Atimonan Municipal Library, Luis Palad National High School, Quezon Provincial Library, Lucena City Library, St. Joseph Academy, Camflora National High School, and the PUP-Mulanay.

The training session also coincided with the signing of a Memorandum of Understanding between DOST-STII and the participating educational institutions in Quezon. The partnership is a collaborative effort of the DOST-STII and the Librarians Association of Quezon Province and Lucena Inc.

More STARBOOKS units were deployed in Mindoro from May 11-14, 2016.

The beneficiaries were Occidental Mindoro State College (OMSC)-Main Campus, OMSC-Labangan, OMSC-Mamburao, OMSC-Sabluyan, and OMSC-Murtha in Occidental Mindoro; and Matulatula High School, Araceli B. Pantilanan Bacawan High School, and Leandro Panganiban



Sr. Tagumpay High School in Pola, Oriental Mindoro.

STARBOOKS content in six other campuses in the province were also updated, namely Bulbugan National High School, Bansud National High School, Domingo Yu Chu High School (DYCHS), Mindoro State College of Agriculture and Technology (MinSCAT) Calapan campus, MinSCAT Victoria campus, and MinSCAT Bongabong campus.

STARBOOKS' digitized resources cover diverse topics such as agriculture, ICT, food and nutrition, engineering, basic science, geography, education, medicine, ICT and many others. It is a recipient of the 2015 Outstanding Library Program of the Year Award by the Philippine Association of Academic and Research Librarians. The project also previously earned the approval of the international community when the prestigious American Library Association presented it with the American Library Association Presidential Citation for Innovative International Library Projects in June 2015.

For inquiries on STARBOOKS: email dost.starbooks@gmail.com, starbooks@stii.dost.gov.ph, or stiilibrary@gmail.com or log on to STARBOOKS online via www.starbooks.ph. (S&T Media Service)



Priming pupils for the win

Pisay teachers share the groundworks in prepping up for international tilts

By **GERALDINE BULAON-DUCUSIN**

S&T Media Service, *DOST-STII*



Rex S. Forteza during laboratory and field work at the APTJSO competition

THROUGH THE years, teaching has been considered a noble profession and one that entails dedication and self sacrifice. For what they have selflessly offered, teachers are now accorded more opportunities, and, subsequently, more responsibilities.

Two teachers – one from Southern Mindanao Campus (SMC) and the other from the Central Luzon Campus (CLC) – of the Philippine Science High School System (PSHSS) are among the mentors whose task is to hone students for the Philippine S&T workforce. Particularly, these two teachers served as coaches to a couple of teams who bagged the gold in the ASEAN Plus Three-Junior Science Odyssey.

APTJSO is an annual educational event in the field of science and technology for young students aged between 13 to 15 years old who are considered as gifted in science. This event is designed specifically to develop young students in the field of science and technology and to nurture future scientists and engineers.

From the SMC, Suzette A. Palicte armed her team to championship in several events at the 2014 APTJSO held in Thailand. Meanwhile, CLC's Rex S. Forteza poised his team to the top during the 2012 APTJSO held in Brunei.

Both of Palicte and Forteza served as coaches to students who won in the APTJSO.

Childhood dream to being a teacher

For Palicte, becoming a teacher wasn't her childhood dream though she'd often find herself as the teacher in her role-playing days. The case of Rex is the total opposite. He came from a family of teachers; his father and some cousins were teachers. He was no longer

“Minds-on activities coupled with hands-on activities give our students the confidence they need to win.”

- Suzette A. Palicte, PSHS-Central Luzon Campus

surprised to find himself playing the teacher role since he was eight years old.

“I respected my father’s craft seeing that he is able to change the lives of his students back then, I also wanted to make a positive impact to the lives of other people,” Forteza said.

Palicte is a product of PSHS-SMC herself and her love for talking and listening to people made her opt for teaching. As a way of giving back to her alma mater, she chose to teach at PSHS-SMC and has been there for 10 years.

Forteza has been teaching for six years and he chose to teach in PSHS campus because he believes that teaching in Pisay (as PSHS is endearingly called) would challenge him and make him grow as a teacher. And by doing so, he believes he can make an impact in training future scientists and engineers of the country.

For these two, teaching in Pisay compels them to make the lessons more challenging but enjoyable for students, given the students’ aptitude in math and the sciences.

Winning formula and areas for improvement

One of the challenges for both teachers and students in Pisay is joining international competitions in math and science. One of said competitions is APTJSO.

The Philippines has been the undefeated champion in the APTJSO in the last four years. The winners came from the different campuses of PSHS in Luzon, Visayas and Mindanao. And it isn’t merely luck that made this happen.

The coaches attribute these victories to rigorous training, PSHS curriculum, linkages with experts from higher education institutions, and students’ discipline.

“Aside from the inherent intelligence of the students, it is also their dedication to

learning that spelled out their winning streak. Even at their young age, they have tried and succeeded the tough act of balancing academics and other aspects of their life with the daily grind of training,” Forteza said.

Teachers’ training also plays a big role.

“Since most of Pisay’s faculty (members) are trained in the scientific disciplines, they can effectively relate the deep interconnections of the scientific concepts in their disciplines and can even connect them to other disciplines,” he added.

One of the biggest support in terms of enhancing the Pisay teachers’ skills and knowledge comes from the Science Education Institute (SEI) of the Department of Science and Technology (DOST-SEI). DOST-SEI has been consistently providing teachers with learning opportunities through its various programs and projects, such as the Competence Upgrading Programs which aim to increase teachers’ content knowledge and upgrade their competence in teaching

and assess their learning. Another is the Science Teacher Academy for the Regions (STAR), a project that provides an organized scheme of innovative trainings in science, technology, engineering and mathematics.

On the whole, Forteza believes that it was both the discipline and dedication of the students and teachers that enabled them to bag the prize for several consecutive years.

At the CLC, during international competitions, the teachers would usually go first on a briefing. This entails knowing the event, understanding the mechanics, reviewing past results, and checking the availability of needed materials (equipment, chemicals, and books) to train the students.

Afterwards, they would proceed to the training phase. At times, they try to learn first the materials (concepts the students have to learn) and spend time researching on it before relaying it to the students.

CONTINUED ON PAGE 71



DOST-NRCP recognizes outstanding Filipino researchers

By **JOSELITO A. CARTECIANO**

S&T Media Service, DOST-NRCP

OUTSTANDING ACHIEVER AWARDS



DR. MARICAR S. PRUDENTE

is recognized for her exemplary contributions to basic research perfectly evidenced by the volumes of researches she produced on Ecotoxicology and Environmental Chemistry which were published in various internationally indexed scientific publications or ISI.

Dr. Prudente is also honored for her dedication to science and technology education as shown through the numerous programs and curricula she designed to enhance the professional growth of science teachers across the country.

Lastly, she is lauded for her stern commitment in promoting the S&T culture and for her contribution in the improvement of local S&T capabilities through proactive sharing of research outputs as a resource speaker in national and international forums. Dr. Prudente is a Regular Member of the NRCP Division of Governmental, Educational, and International Policies. She is currently affiliated with the Lasallian Institute for Development and Educational Research, DLSU Manila.



DR. MARIAN P. ROQUE

is much-admired for her significant researches and publications in the theory of ordinary and partial differential equations. Her creative ways of mentoring has produced numerous Filipino scholars – some are now in the academe, the others are mathematical practitioners.

Highly praised also are Dr. Roque's contributions to mathematics education and its popularization that elevated the status of Philippine Mathematics some notches higher. This positively influenced the professional growth and development of Filipino math teachers and students.

Dr. Roque is a Regular Member of the NRCP Division of Mathematical Sciences. She is currently connected with the Institute of Mathematics, University of the Philippines Diliman. She also serves as member of the Executive Committee of the International Center for Pure and Applied Mathematics.



DR. ERNESTO V. VALDEZ

is lauded for his innovative researches on Philippine medicinal plants and other natural products which benefitted the Filipino people. One of these is the determination of the efficacy and safety of several therapeutic agents especially anthelmintics and amebicides which have been used to abate infectious diseases in the country.

Dr. Valdez is also honored for his unwavering commitment to teaching and inspiring generations of medical students, researchers, and young teachers in the health profession. Dr. Valdez is a Regular Member of the NRCP Division of Medical Sciences and is Professor Emeritus, College of Medicine, University of the Philippines Manila.

The National Research Council of the Philippines (NRCP) in its Annual Scientific Conference and 83rd General Membership Assembly held last March 16, 2016 at the Philippine International Convention Center conferred Outstanding Achiever Awards to three Filipino researchers/scientists, Outstanding Research Institutions to four academic institutions, Award of Distinctions to four Filipino researchers, and Honorable Recognition Awards to two NRCP Member Emeriti.



DR. ALICIA P. CATABAY

is recognized for her valuable contributions to research in the area of Separation Science.

Highly commended too was Dr. Catabay's extensive studies on the pharmaceutical application of capillary electrochromatography and electrophoretic enantioseparation, using various forms of cyclodextrin as chiral selector.

Dr. Catabay is a Regular Member of the NRCP Pharmaceutical Sciences and currently with the College of Pharmacy, De La Salle Health Sciences Institute.



DR. NELLY S. AGGANGAN

is much-admired for her outstanding accomplishments in mycorrhiza research and her involvement in the successful commercialization of "Mykovam," a microbial fertilizer effective for the increased survival and growth of agricultural crops and forest trees.

Dr. Aggangan's research works provided not only an alternative low-cost replacement for expensive chemical fertilizers but also a bio-control agent against organisms harmful to plants.

Dr. Aggangan is a Regular Member of the NRCP Division of Agriculture and Forestry and currently associated with the National Institute of Microbiology and Biotechnology, University of the Philippines Los Baños.



DR. ARVIN C. DIESMOS

is honored for his unparalleled contributions to local wildlife biology, particularly on the systematics, ecology, biogeography and conservation biology of Philippine reptiles and amphibians alongside with his dedication to curating invaluable national wildlife heritage collections and serving as a model for biologists and wildlife scientists in the country.

To date, Dr. Diesmos, with his peers, listed more than 50 discoveries and descriptions of species of frogs, snakes, lizards, and other wildlife including the rediscovery of rare, little-known, and endangered species of fauna. He and his research associates had published volumes of documentation of biological diversity across the country, including those threatened ecological communities, of which 130 articles were featured in various scientific reference materials, books, peer-reviewed and ISI journals. Also lauded is Dr. Diesmos' staunch advocacy to educate and empower local communities, in most vulnerable areas in the country, in averting biodiversity collapse.

Dr. Diesmos is a Regular Member of the NRCP Division of Biological Sciences and currently affiliated with the Herpetology Section, Zoology Division of the National Museum of the Philippines.

OUTSTANDING ACHIEVER AWARDS



DR. JORGE V. TIGNO is honored for his pioneering and continuous contribution in research on international migration of Filipinos which were published both in local and international journals.

Dr. Tigno is also lauded for being a conscientious and active professor who helps others develop their studies in the field Social Sciences.

Lastly, Dr. Tigno is much-appreciated for serving and helping strengthen professional organizations like the National Research Council of the Philippines, as Social Sciences Chair (2008-2010) and the Philippine Political Science Association (PPSA) as elected President (2003-2005).

Dr. Tigno is a Regular Member of the NRCP Division of Social Sciences and currently with the Department of Political Science, College of Social Sciences and Philosophy, University of the Philippines Diliman.



DR. MELITO A. BACCAY is recognized his pioneering contributions in the development of electrochemical non-destructive test methods for evaluating the condition of concrete and steel reinforcement corrosion in structures.

Dr. Baccay initiated innovations in the field of concrete materials and durability studies in concrete structures exposed to carbonation and chloride attack.

Also praised is Dr. Baccay's unwavering dedication to teaching, mentoring, and inspiring students, researchers, engineers, and young teachers in civil engineering.

Dr. Baccay is a Regular Member of the NRCP Division of Engineering and Industrial Research. He is affiliated with Technological University of the Philippines Manila.



DR. MAY T. LIM is recognized for her significant contributions in the fields of signal and information processing, complex systems, and data science as shown by her various publications in high impact international peer-reviewed journals.

Dr. Lim is likewise honored her contributions in science education and mentoring of young physicists. Her involvement in various organizations which promote scientific enterprise and public appreciation of science were also highly praised.

Dr. Lim is a Regular Member of the NRCP Division of Physics and is currently affiliated with the National Institute of Physics, University of the Philippines Diliman.

OUTSTANDING ACHIEVER AWARDS



DR. MYLENE M. UY is honored for her exemplary achievements and invaluable contributions to research in the field of Natural Products Chemistry particularly on drug discovery and development from Philippine medicinal plants endemic in Mindanao.

Dr. Uy's exemplary leadership in the implementation of the first Tuklas Lunas Development Center of DOST-PCHRD in Mindanao is also highly praised along with her unwavering dedication and support in the development and promotion of natural products research in Region.

Dr. Uy is a Regular Member of the NRCP Division of Pharmaceutical Sciences and is currently with the Department of Chemistry, Mindanao State University – Iligan Institute of Technology.

**MS. EDNA L. JUANILLO**

is honored for her research contributions to and productive activities on climatology, climate change, vulnerability assessments and applied meteorology and climatology, particularly seasonal climate forecasting.

Ms. Juanillo's research activities and extension services to critical socio-economic sectors of the country promoted better public understanding of the science of meteorology which greatly improved the people's appreciation of weather, climate, and hazard-preparedness and awareness.

Ms. Juanillo is a Regular Member of the NRCP Division of Earth and Space Sciences and is currently with the Philippine Atmospheric, Geophysical and Astronomical Services Administration, Department of Science and Technology.

**DR. CONSOLACION R.**

ALARAS is recognized for being a dedicated proponent of restoring the ancestral role of language, literature, arts, history, and spirituality as the heart and soul of national development, transformation, and unity.

Dr. Alaras is also lauded for being a distinguished pioneering scholar in Philippine Cultural Studies, especially minority voices, millenarian discourse, and sacred politics and for being an exemplary crusader, both as civic leader and civil servant leading and serving figurative Katipunans of government and non-government agencies towards appreciating Philippine culture and arts (as NCCA Director), preserving Pamitinan protected areas (Pamitinan Boards –DENR and NCCA), preventing corruption and promoting moral recovery (Anti-corruption Council, and UNCAC), and heading the movement for "citizenship by grace in education, governance, development, and diplomacy" (Rizal-Blumentritt Academy).

Dr. Alaras is a Regular Member of the NRCP Division of Humanities and formerly with the College of Arts and Letters, University of the Philippines Diliman until her retirement.

AWARDS of DISTINCTION



DR. AMARYLLIS T. TORRES
Philippine Social Science Center

For her lifetime achievement work on gender and labor, in which she helped re-conceptualize gender equality and empowerment in countries all over Southeast Asia and the world for more relevant sustainable development to help alleviate poverty and gender inequality; her work that opened the eyes of governments and developed programs that aimed at eliminating discrimination against the girl child; for helping create a climate for innovative mainstreaming of gender sensitivity, not only in the Philippines, but internationally.



CHEMICAL SCIENCES
NRCP Award of Distinction for 2015

DR. FORTUNATO B. SEVILLA III

Professor Emeritus
College of Science
University of Santo Tomas

For being an outstanding scientist, innovator, and leader who made significant contributions in the field of analytical chemistry, through his pioneering innovative work in chemical sensors and biosensors; his active and dedicated involvement in both local and international academic and chemistry communities, with papers published in leading international journals; his distinguished contributions as reflected in patents and in low-cost instrumentation he developed for chemical education; and his zealous desire in mentoring the young minds to become scientists themselves.



HUMANITIES
NRCP Award of Distinction for 2015

DR. FELIPE M. DE LEON, JR.
National Commission for Culture and the Arts

For being an exceptional composer, scholar, professor, and researcher who has actively nurtured and supported Philippine and Asian arts as well as their native media and instruments, from the classrooms and conference halls to the national commission and its diverse sub-commissions which he had helped create and led; for being a deeply committed cultural administrator who has dynamically promoted the advancement and recognition of cultural traditions, artists and craftsmen, spearheading and institutionalizing the Gawad sa Manlilikha ng Bayan (National Living Treasures Awards), establishing the Schools of Living Traditions, and working for the proclamation of the Ifugao chants, hudhud, and the Maranao epic "Darangen" by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as Masterpieces of Oral and Intangible Heritage of Humankind; and for being Internationally recognized nationalistic artist and cultural ambassador, who has propagated the Filipino soul, celebrated its identity, and its roots, in lectures here and abroad, in leading organizations and movements (Kayumanggi sa Ikasusulong ng Kultura/Brown Movement for Cultural Advancement, and Kasarinlan Philippine Music Ensemble).

NRCP OUTSTANDING INSTITUTIONS



**NATIONAL INSTITUTE OF
MOLECULAR BIOLOGY &
BIOTECHNOLOGY (BIOTECH)
UNIVERSITY OF THE
PHILIPPINES LOS BAÑOS**

For its 36 years of exemplary performance as a premier R&D Institution for basic and applied researches on molecular biology and biotechnology, for developing cost-effective and environment-friendly technologies resulting in the production of goods and services that are comparable or better alternatives to conventional products for use in agriculture, forestry, environment, energy and industry; for upholding its mandate in meeting the country's societal needs by integrating the various disciplines of science towards a vision of agro-industrial breakthroughs which were made possible by rigorous research and development. From 2010 – 2015, BIOTECH implemented 301 basic and applied researches in the areas of agriculture, forestry, food, feed, environment, industry, and natural products.

BIOTECH's dedicated and brilliant researchers have developed 38 cost-effective and environment-friendly products that include biofertilizers, microbial-based enzymes, animal probiotics, animal vaccines, microbial pesticides, and DNA and immune-based foodborne and plant pathogen diagnostic kits. Many of these products are now adapted by local farmers, testing laboratories, and by public and private agencies as well as R&D institutions.



**RESEARCH CENTER FOR
THE NATURAL AND APPLIED
SCIENCES
UNIVERSITY OF SANTO TOMAS**

For its significant contributions in Philippine science and technology landscape through important accomplishments in its research of natural products, chemical sensors and biosensors, low cost instrumentation, pure and applied microbiology, molecular diagnostics, biodiversity and conservation, and novel energy storage materials; its outstanding researchers whose expertise and productivity are acknowledged in their area of specialization, also leaders in academic and scientific organizations; the institution's involvement and sustained engagement in high-impact research, manifested by the publications and citations of its researchers in national and international peer-reviewed scientific and scholarly journals; its conducive and effective research environment for the mentoring and nurturing of junior researchers, graduate and undergraduate students, as well as high school students, as recognized by numerous national and international scientific organizations; and its fruitful partnerships and linkages it has established with universities and research institutes from within and outside the country, promoting cooperation in the pursuit, generation, and the dissemination of knowledge.



**PHILIPPINE NORMAL
UNIVERSITY**

In recognition of its contributions to the country as the leading institution for teacher education through institutionalization of an encouraging research environment for the faculty and students; impressive research outputs for the last five years which served as basis for policy making in the education sector and teacher education in particular; publications in international referred journals; and pioneering efforts on research collaboration in the ASEAN region.



**PHILIPPINE ATMOSPHERIC,
GEOPHYSICAL AND
ASTRONOMICAL SERVICES
(PAGASA)
DEPARTMENT OF SCIENCE
AND TECHNOLOGY**

In recognition of the agency's contribution in strengthening disaster preparedness and awareness among our people through the upgrading of its weather forecasting capabilities; thus, fortifying the reliability of its scientific endeavors.

OUTSTANDING ACHIEVER AWARDS



DR. GERRY A. CAMER is lauded for his significant contributions in the field of veterinary public health and pathology. Dr. Camer's researches in Rickettsia, Helicobacter, and Coxiella led to the formulation of recommendations in the prevention of diseases caused by these pathogens in the Philippines.

Much-appreciated also was Dr. Camer's leadership and dedication to the veterinary profession that inspired veterinary students and peers along with several books and manuals he authored that are now being used as guides by future veterinarians.

Lastly, Dr. Camer was recognized for his exemplary commitment and devotion to quality research and education which led to other prestigious recognitions like the VPAP Most Outstanding Veterinarian in Research, the CHED Republica, and the PVMA Outstanding Veterinarian in Education.

Dr. Camer is a Regular Member of the NRCP Division of Veterinary Medicine and is associated with College of Veterinary Medicine, University of Eastern Philippines.

NRCP MEMBER EMERITUS



DR. VIVENCIO R. JOSE

formerly with the
College of Arts and Letters
University of the Philippines
Diliman

for being a nationally renowned scholar whose distinguished research has established him as a stalwart of cultural studies and literary-political interrelations; whose socio-politically committed publications (notably, the seminal *Heneral Luna*) have incisively deconstructed historical and political developments and figures; for being an esteemed academic leader who initiated numerous laudable projects promoting Philippine studies and Philippine folk literatures, establishing the tri-college Philippine Studies Program of the University, and becoming its first dean, and founding the national organization of Philippine Folklorists, yet simultaneously upholding English and literary studies; and for being a dedicated university administrator and champion of education, widely respected for his accomplishments, his intellect, and his integrity.



DR. BEATRICE Q. GUEVARA

Professor Emeritus
University of the Philippines and
University of Santo Tomas

for her inspiring leadership in the formulation of policies and setting directions for the growth and development of basic sciences in the field of chemical sciences; for her distinguished membership in the Council, and being an inspiration to budding scientists in the country.

Forty-eight years spent in public service is truly a feat of fortitude and excellence, and more so when devoted to the advancement of one's field and profession.

A portrait of Dr. Alumanda M. Dela Rosa, a woman with short brown hair, wearing a grey blazer over a red patterned blouse and a pearl necklace. She is smiling slightly and has her hands clasped in front of her.

Dr. Alumanda M. Dela Rosa:

Nuclear scientist, director, civil servant par excellence

By HANS JOSHUA V. DANTES
S&T Media Service, DOST-PNRI

STORY ON NEXT PAGE

FOR MOST of the history of the Philippine Atomic Energy Commission (PAEC), now the Philippine Nuclear Research Institute (PNRI), its stalwart Director, Dr. Alumanda Dela Rosa, has been both a witness and a key player on PNRI's and the Philippines' strides in the field of nuclear science and technology.

She started from being an aspiring student in the provinces to serving beyond retirement age to be among the most respected scientists in the field of nuclear and radiation technology here and abroad. Director Dela Rosa's journey serves as an inspiration not only to civil servants and administrators alike, but also among the youth, who will one day follow in the footsteps of one of the highest ranking scientists in the country.

A Lifetime of accolades

Dr. Dela Rosa was conferred the rank of Career Scientist IV in 1991 under the Scientific Career System

(SCS), the highest rank accorded to a Filipino scientist to date, and is also a Career Executive Service Officer (CESO) IV under the Career Executive System (CES). She is also a recipient of numerous awards and accolades, including the 2015 Gawad CES Presidential Award, the World Association of Radiopharmaceutical and Molecular Therapy (WARMTH) Lifetime Achievement Award in 2013, the Women in Nuclear (WIN) international award by the World Nuclear Association in 2005, among others.

Humble beginnings

Even with all these accomplishments, Dr. Dela Rosa's humility remained undiminished by time or rank. Indeed, she could still look back to the days when she was but one among many high school students in the province of Abra, who have yet to decide what career should they take, and all it took was one nudge from her teacher to set the would-be scientist on the path to success.

"Our role models were our teachers, so at that time, I thought I would be a teacher. But then, my science teacher suggested to me, 'Why don't you go to chemistry?', and I thought it was a good idea," she told students and young professionals during the First Philippine Nuclear Youth Summit on December 7, 2015.

She went to Manila to study at the College of the Holy Spirit and graduated with a degree in Chemistry in 1968. It was during her stay in the college that she first learned about nuclear science and technology, as several of her professors were scientists from the Philippine Atomic Energy Commission (PAEC), which would later become the PNRI. She later completed her undergraduate thesis at PAEC, and she said that this strengthened her interaction with the scientists in the nuclear field.

Right after graduating, she began her career in government service as a Nuclear Research Assistant in PAEC. While rising through the ranks, she completed her graduate studies at the University of Hawaii in the United States of America, earning her doctorate degree in Biochemistry in 1977.

Her dissertation on the effects of radiation on the biological membranes of *Escherichia coli* (E. coli) was one of the very few works of its kind at that time, when most



scientists worked on the effects of radiation on DNA. Dr. Dela Rosa would go on to author and publish more than 45 papers on nuclear S&T, particularly in radiation chemistry.

After obtaining her Ph.D., Dr. Dela Rosa became a professional lecturer and also served as a consultant for several government agencies and corporations.



The Director also participates in occasional aerobics

Career Scientist

According to her, it was during her work on applied research at PAEC that she “evolved from being a radiation biochemist to a radiation chemist,” and she led her team to develop several radiation-modified products from natural polymers found in indigenous materials such as rubber latex, plantation trees, cellulosic waste, and carrageenan extracted from seaweed.

Aside from these, she also conducted research on the radiation chemistry of biomolecules, environmental chemistry and coastal pollution due to heavy metals and harmful algal blooms or “red tide”.

Radiation chemistry specialist Dr. Dela Rosa at work in one of the PAEC laboratories

Director of PNRI

Dr. Dela Rosa finally took the helm of PNRI in 1998 as its Acting Director, succeeding Dr. Carlito Aleta and became the Institute’s full-fledged Director in 2003, and would serve for 13 years in that capacity.

Her leadership proved crucial at the turn of the century, as PNRI was already shifting its efforts beyond the nuclear power program and into expanding the applications of nuclear S&T technology in the country.

During her term, several new facilities were established, such as the Technetium-99m Generator Facility, the Non-Destructive Testing (NDT) Laboratory and the Secondary Standards Dosimetry Laboratory (SSDL), among others, and the upgrading of the Atomic Research Center and the Cobalt-60 Multipurpose Irradiation Facility

from a pilot-scale to an income-generating semi-commercial facility, among others.

Consistent with PNRI’s dual mandate, the Director also oversaw developments in nuclear regulations, safety and security.

Moreover, during her watch, the Philippines was awarded the IAEA Atoms for Peace Award early in 2016 along with 15 other Member States in recognition of the country’s contributions in nuclear security, particularly through the removal of highly-enriched uranium from the country’s territory.

Due to no small effort by the Director and the Institute’s officials, PNRI also received the

ISO 9001:2008 certification of its Quality Management System in December 2014, in line with the government’s efforts to ensure that its services are compliant to international standards.

The Lighter Side

In every achievement, Director Dela Rosa always expresses her gratitude to the men and women of PNRI, “without whom [this] would not be possible.”

Further, knowing the need for a sound mind in a sound body, she does exercise with other PNRI personnel during spare time, and when asked what will be the first thing she will do when she retires, the Director said she’ll be jogging.

For all that she is and all that she has accomplished, Director Dela Rosa will always be an inspiration to the officials and staff of PNRI. It is to her greatest credit that she will retire from the Institute knowing that nuclear science and technology will further prosper under a new generation, building up upon the strongest foundations laid down by PNRI’s longest serving director to date, and the first woman to serve as Director in the Institute’s 58 years of existence.



Pisay studes bag awards in int'l math, science tilts

By **FATIMA M. MONCADA**

S&T Media Service, *DOST-STII*



The team that won the Silver medal and special award for Best Presentation

STUDENTS OF DOST's Philippine Science High School (PSHS) Main Campus proved recently that they are indeed globally competitive.

In the recently concluded Singapore International Mathematics Challenge (SIMC), Leodegario Orpilla, Yzan Paolo Cadigoy, Rafael Santiago, and Elijamin Claveria won the Silver medal and the Special Award for Best Presentation for their exceptional real life problem-solving skills.

The SIMC, a biennial event held in Singapore, is no usual competition as it tests

the young contestants' skills in the application of mathematics by giving them three real world problems to solve in a span of almost two days.

The time given to the contestants may sound ample but it did not take away the challenge's rigor. According to Santiago, "We had to resort to submitting five minutes before the deadline, and had to run up four floors to do so."

But the challenge did not conclude with their ascent four floors above. The students were asked to present their strategies and



The Philippine delegation, composed of Marla Abao, Mikhail Torio, and Justine Oplencia, together with their foreign teammates, topped the Science Challenge, a science-themed Amazing Race in the International Student Science Fair 2016.



Marla Abao, a student from the Philippine Science High School (PSHS) Main Campus, received the Best Oral Presentation award for her paper titled "An Android Application for Efficient Disaster Kit Procurement for Low-Level Floods" at the International Student Science Fair 2016 held in Singapore.

solutions to three judges in three different occasions within 20 minutes. Fortunately, they did so excellently.

Coming from this year's second place win, Santiago is hopeful that the Philippines will top the challenge in 2018. "This adventure is one for the books, and I hope the next team, which I hope we can pass our knowledge to, will be able to bring the Gold home!" he said.

SIMC is participated by top science schools across the globe such as NUS High School of Math and Science, Korea Science Academy of KAIST, and Illinois Mathematics and Science Academy among others. The PSHS Main Campus was the only Filipino team in this year's challenge.

Meanwhile, Pisay (the playful name coined by PSHS alumni) Main Campus student Marla Abao recently bagged the Best Oral Presentation award at the International Student Science Fair (ISSF) held at the National University of Singapore - High School of Math and Science in Singapore.

Abao won the prize for her research titled "An Android Application for Efficient Disaster Kit Procurement for Low-Level Floods."

Abao, along with her schoolmates Mikhail Torio and Justine Oplencia, individually presented Pisay Tech Projects to international audience.

Aside from the research presentation, said Pisay students also participated in other fun ISSF activities such as the Science Challenge, a science-themed Amazing Race. The three students, merged with another set of American students, likewise topped the competition.

The ISSF is an event hosted by members of the International Science Schools Network (ISSN) on a rotating basis. The PSHS Main Campus was invited to become an associate member, giving the country a chance to host the event in the future and to present the local science education scene to the international community.

The students also joined a holography and optics workshop where they created and

took home their own mini holograms.

A hologram is a three-dimensional image projected from lights coming out of a two-dimensional surface.

During the workshop, the students also tinkered with fiber optic technologies that were made by Nobel Prize winners.

On the other hand, a visit to two aerospace companies, Thales and Airbus, gave the said Pisay students an idea on how the industry works. They were shown Thales' business processes and Airbus' design conceptualization.

To cap off the event, the participants gathered in an Alice in Wonderland-themed tea party. Indeed, the fair was able to highlight that science is not all about excellence; it can be a whole lot of fun too.

The ISSF convened teachers and students of science high schools from Asia, Africa, Europe, Australia, and America to share their researches and celebrate science.

Cater King Food Corporation

Seizing new markets through DOST's SETUP

By **EDGILYN R. ALCASID**

S&T Media Service, *DOST-NCR*



From left: Engr. Arman P. Bionat (assistant regional director, TOD DOST-NCR), Maria Teresa D. Laurel (president/COO, Cater King Food Corporation), Dr. Teresita C. Fortuna (regional director, DOST-NCR) and Herman T. Laurel (treasurer, Cater King Food Corporation) sign the MOA for SETUP assistance.

BE IT beating the blues on a rainy morning, riding through the nostalgia of juvenile days, or just simply appeasing hunger, one's comfort food has always been a reliable blanket and companion. Among Filipinos, one of the notable comfort food favorites is a heaping serving of a hot and flavorful rice porridge or "goto." In the Philippines, "goto" refers to a rice porridge with beef tripe or in the vernacular, "twalya ng baka."

Traversing Luzon to various areas in the Visayas, Goto King, a branded product under Cater King Food Corporation, is one of today's most prominent franchise establishments delivering high quality and affordable goto to Filipino consumers.

Expanding production capability through DOST's SETUP

The food ingredients used in all Goto King outlets are processed in the company's commissary to ensure consistency in the quality of food and materials. However, with the popularity of Goto King and the increasing demand for its products, the owners saw the urgent need for an updated production facility and food processing equipment.

Encouraged by the company's previous successful collaboration with the Department of Science and Technology-National Capital Region (DOST-NCR) through the Small Enterprise Technology Upgrading Program

(SETUP), Cater King Food Corporation again applied for technical assistance and signed a Memorandum of Agreement last April 4, 2016 with DOST-NCR's Regional Director, Dr. Teresita C. Fortuna.

For its second cycle in the program, Cater King Food Corporation will be provided assistance in acquiring new pieces of food processing equipment to improve its operations. The equipment include a blast freezer, goto cutter, and oil filter. Moreover, training assistance will be provided to ensure conformity to food safety and good manufacturing practices. The science and technology (S&T) interventions are also

expected to provide longer shelf-life to partially prepared or cooked products manufactured by Cater King Food Corporation.

From a small table to over 27 franchise establishments

Similar to other success stories, Goto King also started from humble beginnings and is now expanding its operations to serve more markets.

It started as a simple food cart in Cubao in 1983. The owners, Mr. Herman Laurel and his wife, Mrs. Maria Teresa Laurel, initially delivered food products to consumers in Divisoria and the University belt where they have been catering to canteens and business establishments.

A good opportunity to expand the business came in 1987 with the offer to open a stall at SM North Edsa Food Court. That time, there was already a proliferation of fast food chains offering Western food products such as fried chicken, burgers, and spaghetti. However, there was a need to ensure availability of Filipino favorites among food establishments. It was then that they thought of bringing flavorful, hot, and affordable goto to consumers in the Metro.

“We wanted to deliver good, clean, and affordable fast food to Filipinos. That’s when we thought of selling goto as we know it is what the masses want,” recalled Mrs. Maria Teresa Laurel, president of Cater King Food Corporation.

From a single cart selling goto, lugaw (plain porridge or with chicken or egg) and tokwa’t baboy (bean curd with stir-fried pork), Goto King eventually gained popularity and grew into a network of carts and kiosks. The increasing demand for their products paved bigger opportunities to also cater to other markets outside Metro Manila. Further, Goto King expanded their product line by offering merienda (snack) items, rice meals, and breakfast meals.

Today, Goto King already has 27 franchise establishments in Luzon and Visayas and is also eyeing to expand its market by exporting products from their “Mama Rosa” line which include bottled relishes, sauces, and condiments.

Goto King goes global

Now that more opportunities have opened through the ASEAN Economic Integration, new opportunities for bigger markets are also up for grabs. The Laurels believe that through SETUP assistance, they can take advantage of these new opportunities and upscale their productions.

“Technological assistance is really necessary for any business establishment to flourish. Various food processing equipment play an important role in enhancing a food business’ production capability. That is why the support from DOST’s SETUP is very important,” Mrs. Laurel said.

Mr. Laurel added that through the second cycle of support from SETUP, they are hoping to further expand the distribution of products under the Mama Rosa line and cater to leading supermarkets nationwide.

“We are very glad to again assist Cater King Food Corporation as we believe S&T truly plays an important role in improving the production capability of food establishments,” stated Dr. Teresita C. Fortuna.

Dr. Fortuna also affirmed that SETUP will continue to support more micro, small and medium enterprises in the Metropolis so they can also expand their production capabilities and take advantage of new opportunities arising from the ASEAN Economic Integration.

Forteza said he rarely comes across seminars for coaching for competitions so what they do is to learn things as they move along with the preparations.

Pisay campuses may have been on top of their game in producing the country’s future scientists and engineers, but there are still plenty of room for improvement. Palicte cited laboratory skills training for one. Forteza, on the other hand cited communication skills as one area which the students can hone. Communication skills can help them effectively deliver what they want to convey, especially during presentation of their researches in research fairs.

CLC embarks on the challenge of improving the creativity and design thinking of the students by putting up facilities like the Fabrication Laboratory, providing students with an avenue to try out and realize their ideas.

The APTJSO experience and the future

The APTJSO has given said teachers opportunity to improve their craft. The training has compelled them to teach some ideas, concepts, and skills that they don’t usually teach inside the classroom. The experience enabled them to teach the students how to merge the scientific concepts and practice through experiments.

“APTJSO served as a vehicle to develop the mentor-mentee relationship between us and the delegates, where we can have a more open line for dialogue and discussion not only for academics but into life in general,” Forteza said.

The APTJSO experience has inspired Palicte to look for more strategies on how to make her classes engaging.

“Minds-on activities coupled with hands-on activities give our students the confidence they need to win,” she said.

Aside from teaching, which she sees herself doing until she retires, Palicte likes to sing and organize events. Forteza, on the other hand, plans to embark on a higher degree, most likely a doctorate in physics. His other goals include doing better in photography or hiking towards the peak of at least one mountain in the Philippines.

To the young people, “Innovate and be a catalyst of change,” Palicte advised.

Forteza, meanwhile, has this to say: “Never shy away from hard work if it makes you reach your dream. It is by investing your time and effort to worthwhile activities that you can find fulfilment on what you do especially if it is your passion.”

(Right) Members of the Camarines Norte Pili Growers and Processors Association (CNP GPA) learned to make handicraft items from the pili shell (below) and extract oil from the pili nut (right), improving their livelihood opportunities.



CamNorte folks find more opportunities in pili oil extraction and handicraft making

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

THE TRAINING courses, organized by the Department of Science and Technology's Forest Products Research and Development Institute (DOST-FPRDI), were part of the project "Technology transfer on community-based pili nut and pili by-products processing and marketing in Camarines Norte." The training focused on optimizing the use of pili resources in the province by developing, enhancing, and promoting techno packages on pili by-products from kernels, pulp, shells, and resins.

According to project staff Florena Samiano, seven seminar workshops serving 168 attendees were held last year. The seminars covered several topics such as extracting oil from pili kernel and pulp; making confectioneries from pili kernel; charcoal briquetting and crafts production from pili shell; marketing, packaging and labelling of pili by-products; and sustainable tapping of pili resin. After attending the training on resin tapping, participants themselves trained tappers in other towns.

The project likewise donated to the CNPGPA a set of drum kiln and charcoal briquetting machine now being used provincewide; and two sets of pili de-pulper, oil extractor and oil filtering machines. The local government of Paracale town, on the other hand, provided a hack saw and bench drill to the town's Rural Improvement Club, a

member of the cooperative.

The CNPGPA was also linked to an established pili resin exporter who committed to buy all the coop's resin harvest for a competitive price.

According to Project Leader For. Arsenio B. Ella, Scientist III, "Candies and pastries are the usual products which make use of the pili nut. The nut, however, is 68 percent pulp, 25 percent shell, and 7 percent kernel. And due to unfamiliarity with information among processors, a lot of it (pili nut) normally goes to waste. The pili pulp oil, for instance, is a promising material for the food, pharmaceuticals, and cosmetics industries. It has chemicals that can help prevent pimples, making it an ideal ingredient for bath soaps as well as massage oil."

Pili trees thrive in the Bicol Region, with products reaching Australia, Canada, China, France, Germany and the U.S. At present, more than 10,500 productive trees grow in Camarines Norte alone.

The project was financed by the Department of Agriculture-Bureau of Agricultural Research and supported by the local government of Camarines Norte, and the provincial offices of Department of Science and Technology, Department of Trade and Industry, Department of Agriculture, and the Camarines Norte State College.

Get ready for 'emergency food'

By **SEAN ADRIAN T. GUARDIANO**

S&T Media Service, *DOST-Negros Oriental*

DISASTERS USUALLY leave people hungry. But if local governments and concerned agencies stocked up emergency food reserve in their pantries, there is very little reason to worry.

This emergency food reserve or EFR, also known as Sagip-Nutri Flour is a blend of powders. It is composed of nutritious crops such as cassava, sweet potato, moringa (malunggay), squash, and mungbean (munggo). These crops are indigenous and can be found in most communities.

This nutritious flour can be transformed into goodies such as noodles, cakes, pastries, bread, powdered drinks, soup, and native delicacies. Aside from filling hungry tummies, the food prepared from EFR also balances and adds variety to food rations and nutrition feeding.

Developed by the DOST-Industrial Technology Development Institute (DOST-ITDI), the EFR was developed to serve as relief food to disaster victims in times of calamity. For entrepreneurs, the technology also opens opportunities for community livelihood and food processors.

The DOST's Negros Oriental Provincial Science recently trained key people in production to notch up its emergency preparedness efforts. According to DOST-NegOr, 25 participants from several government, academic, and private entities, including food manufacturing enterprises attended the trainings that was recently held at the Nutrition and Dietetics (ND) Department Laboratory of Silliman University (SU) in Dumaguete City.

"The purpose of the seminar is to develop an emergency food which can be distributed



Arvyn Klein Mana-ay, one of the resource persons during the training, explained to the participants the proper way to prepare and cook noodles as an emergency food reserve.

as relief food to disaster victims in times of calamity," said Mr. Alvyn Klein Mana-ay of Silliman University, one of the resource persons.

The DOST-ITDI first introduced the EFR technology in Negros Oriental in 2015 through a training- workshop with some professors of the SU-ND, including Mana-ay, Dr. Michele Naranjo, and Ruth Ann Entea who all served as resource persons in the recent training.

After a short lecture about disaster preparedness, food safety, and EFR production's relevance and implications, the trainers and participants walked through the step-by-step procedures of producing the Sagip flour, and its byproducts including chocolate bars, polvoron, and dried noodles.

Meanwhile, a total of 30 entrepreneurs from micro, small and medium enterprises attended the Good Manufacturing Practices

(GMP) Awareness Seminar conducted recently at the Nutrition and Dietetics Department at Silliman University.

"Food safety refers to the elimination of hazards that may make food injurious to the health of the consumers," said Mrs. Evelyn Fajardo, one of the resource persons. "From farm to plate, let us make our food safe."

She added that many of the potential hazards in a processing plant are prevented by using a standard set of principles and hygienic practices for the manufacturing and handling of food.

Resource persons Ana Vee Riconalla and Geraldine Quiñones of the NOFST discussed GMP relevance, implication and hazards, personal hygiene, and environmental and industrial hygiene. They also demonstrated the proper handwashing technique.

The Basic Food Safety Seminar and EFR Training are part of the training series set this year by the DOST-NegOr in partnership with SU-ND and the NOFST.

DOST NIR OIC-ARD FAS Atty. Gilbert R. Arbon (leftmost) with the participants of the EFR training. With him is Dr. Roslyn D. Tambago, (second from right) OIC-PSTC Negros Oriental.



Help the poor through innovative research, DOST VII head urges scientists in the Visayas

By **LICINIO F. GINGOYON**

S&T Media Service, *DOST-VII*



Annual Scientific Conference: DOST 7 Regional Director Edilberto L. Paradela challenges Visayas scientist to use innovative research to promote inclusive growth as "it is the social and moral duty of those who possess the gift of science to commit their intellectual gifts to the betterment of the world, most especially of those who have less in life."

THE DEPARTMENT of Science and Technology Region VII Director Edilberto Paradela urged scientists in the Visayas to do researches that promote "inclusive development." Speaking before the participants in the scientist conference at the University of San Jose Recoletos (USJR) Auditorium, Paradela stressed doing such fulfills the scientists' moral and social duties to help alleviate the living condition of grass root communities.

The regional director said that while the country's economy has improved tremendously, the grassroots have not enjoyed the benefits of economic growth. Thus he made the appeal to Visayan scientist-participants to the Annual Scientific Conference held recently by the DOST-National Research Council of the Philippines

Visayas regional cluster. The DOST-NCRP has about 4,000 members all over the country.

Paradela noted that while the Philippines has posted an unprecedented average economic growth rate making it one of the best performing economies, many have remained poor.

"In spite of the country's economic feat, a considerable segment of the population is unable to enjoy the fruits of economic gains," Paradela said. "Apparently, the bulk of the country's new wealth created by economic boom has failed to trickle down to the grassroots level of society, thereby creating a much wider divide between the rich and the poor."

"The disparity in the distribution of the nation's wealth necessitates urgent appropriate action on those who have the abilities to bring

social justice to the impoverished sectors of our society," he added.

Challenging the conference participants, Paradela underscored the need for the members of the scientific community to support the government by "doing their parts in addressing this pressing need for inclusive growth and development in the country through innovative research."

He further said that "it is the social and moral duty of those who have the gift of science to commit their intellectual gifts to the betterment of the world, and most especially of those who have less in life."

"With your crucial participation, we in the government would be able to work more effectively in achieving our common goals of uplifting the lives of the grassroot communities," he pointed out.

DOST IV-A gets Philippine Quality Award

By **JUAN CARLO M. MANAS**

S&T Media Service, DOST IV-A

DOST IV-A recently received the Department of Trade and Industry's formal letter of notification of the regional office as recipient of the country's highest level of national recognition for exemplary organizational performance.

PQA is the counterpart of the prestigious Malcolm Baldrige National Quality Award given in the US. The flagship program of the National Action Agenda for Productivity (NAAP), the PQA is designed to be the country's integrated approach towards economic-wide productivity development. This was established during the term of former President Fidel V. Ramos in response to the growing challenges of globalization.

Taking advantage of past mistakes

PQA assesses candidate organizations along the criteria of leadership, strategic planning, customer and citizen focus, measurement analysis and knowledge management, human resource focus, process management and business results.

Dr. Alexander Madrigal, regional director, said that the government and its services should be globally competitive, customer friendly, and responsible to the outcomes of its operations. Such qualities would eventually gain the trust of private citizens and businessmen to avail the services of government agencies.

Madrigal said, "Our journey to the attainment of the PQA has marked the footprints of our collaborative and cohesive efforts as a committed organization to quality service and excellence in performance. This is a realization made possible by our people serving the organization for the benefit of our fellowmen and our nation. It is for us to live to the ideals and expectations bestowed with such recognition and not to rest on its laurels but to remain steadfast in our core values as an organization and public servants forging ahead to the next level.



PQA-Awards and Recognition

Bear to mind that all these will remain as an ornament if the outcome does not resonate to genuine welfare and development of our constituents."

A power team of six PQA assessors conducted on-site compliance inspections, process audit, random employee interviews on their perspective for the organization and job satisfaction. The results were carefully deliberated following strict procedures.

The vigorous management system resulted in the superior result of its best practices and business success which can serve as benchmark to other organizations.

The dynamism, teamwork, innovativeness, focus on customer and citizen needs, passion for excellence, and leadership are the six core values that pushed DOST IV-A on this journey towards the Mastery of Quality Management. The organization maintains relevance in the public sector by being proactive and responsive to changing environment and customer requirements.

Malacañang Palace is the next stop for the team to receive the award from no less than the President himself.

DOST IV-A will receive a prestigious trophy designed by the world renowned glass sculptor, Mr. Ramon G. Orlina.



PUP accords top recognition to DOST-NCR head

By **EDGILYN R. ALCASID**

S&T Media Service, *DOST-NCR*

ANOTHER MILESTONE was added to the various recognitions received by the Department of Science and Technology-National Capital Region (DOST-NCR) Regional Director, Dr. Teresita C. Fortuna, as the Polytechnic University of the Philippines (PUP) conferred her the Tanglaw ng Bayan Award. The award was conferred during the 2016 Year-End Commencement Exercises of the PUP Graduate School, College of Education and Open University last May 11, 2016 at PUP Sta. Mesa, Manila.

"This acknowledgment for the dedication and hard work of a public servant like me is very humbling. It is a validation of trust in what I passionately believe S&T and research and development can do to promote progress in our country," Dr. Fortuna said.

Named after the University's motto, Tanglaw ng Bayan (Light of the Nation) is identified as the highest recognition award

granted by PUP to Filipinos who have exhibited significant contributions to Philippine society and have achieved outstanding accomplishments in his/her field.

The University recognized Dr. Fortuna for her "vast experience as a scientist" as evidenced by the gamut of her accomplishments. The accord was also given as PUP identified Dr. Fortuna to have outstanding, life-changing, and socially relevant achievements which can inspire Filipinos to dream big and work hard.

PUP President Dr. Emanuel C. de Guzman, handed the award with other key University officials and the members of the PUP Board of Regents.

Previous Tanglaw ng Bayan awardees include Mr. Antonio C. Moncupa Jr., Director of the Banker's Association of the Philippines and BancNet; former House Speaker Feliciano Belmonte Jr.; Hon. Senator Juan Edgardo M. Angara; and Atty. Cyril E. Ramos, Deputy Ombudsman.



The two books titled "Trees and Associated Plants at the DOST Compound" and "Plant Collection at DOST Wellness Garden."

Dr. Fortuna is a Postharvest Physiologist with both Bachelor's degree and Master's degree in Horticulture from the University of the Philippines Los Baños. She earned her Doctorate degree in Business Management from the Philippine Women's University.

Dr. Fortuna is a strong advocate for the application of S&T and the strengthening of the country's research and development in line with the priority areas of the government and DOST's research agenda. Moreover, Dr. Fortuna is a staunch advocate for forging stronger linkages among the academe, government, and industry associations through collaborative programs. She also headed the publication of two books titled "Trees and Associated Plants at the DOST Compound" and "Plant Collection at DOST Wellness Garden."

PUP is the country's first polytechnic university and is regarded to have the largest university in terms of student population and geographical reach.

What's up at DOST-NCR?

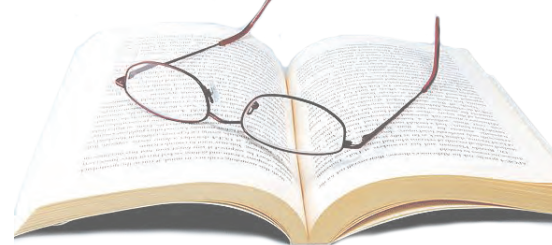


DOST-NCR inaugurated last June 27, 2016 one of its funded and deployed bioreactors in Metro Manila. The bioreactor, developed by the DOST-Industrial Technology Development Institute to convert biodegradable wastes into soil conditioners, is located in the Materials Recovery Facility at the DOST Compound. The bioreactor is seen to play a crucial role in addressing solid waste management concerns at the DOST compound. The newly inaugurated bioreactor involves a small scale two drum composter that can process 50 kilograms of waste per day. The MRF is set to serve as a transfer station of residual and recyclable wastes where garbage will be turned into compost and soil conditioners.



DOST-NCR teamed up with its Science Ambassador and noted technopreneur, Dr. Carl E. Balita in a new project that will deliver maximum assistance to the agency's supported clients and entrepreneurs. Under the terms of the partnership forged last June 23, 2016, Dr. Balita will serve as the owner of DOST's "OneStore Hub-Lyf Center" in Quezon City where buyers nationwide and even from abroad can easily buy products of DOST's Small Enterprise Technology Upgrading Program's (SETUP) beneficiaries. From left: Max Maghacot, president of Philippine Chamber of Commerce and Industries-Quezon City Chapter; Engr. Sancho A. Mabborarang, regional director of DOST Region II; Hon. Joy Belmonte, vice mayor of Quezon City; Dr. Teresita C. Fortuna, regional director of DOST-NCR; Dr. Carl E. Balita, owner of OneStore Hub-Lyf Center; Dr. Roselyn Balita, manager of OneStore Hub-Lyf Center and Lyca M. Balita, general manager of OneStore Hub-Lyf Center (Photo by Henry de Leon, DOST-STII).

The bioreactor at the DOST complex in Bicutan, Taguig City.

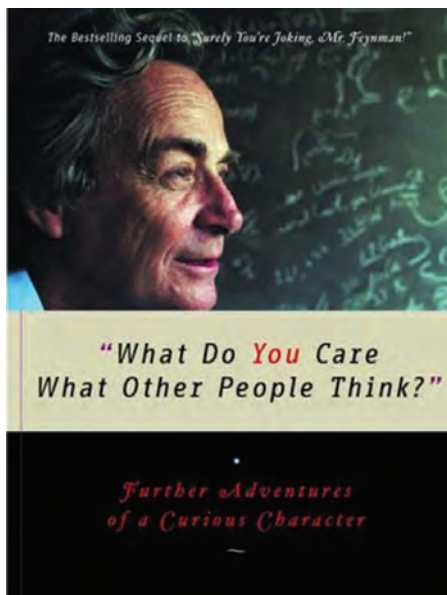


What Do You Care What Other People Think:

The Adventure of a Curious Character by Richard Feynman

By **ALLAN MAURO V. MARFAL**

S&T Media Service, DOST-STII



IF RICHARD Feynman were alive today, he would have been an internet sensation or the present generation's youth icon. With the passion and obsession he had on science—coupled with his skeptical and colorful personality, it is easy to conclude that he would have numerous followers and admirers at this present time.

In the book, "What Do You Care What Other People Think: The Adventure of a Curious Character," authored by Feynman, readers may take a closer look at the life of the great physicist, who had an exceptional way of communicating with the public regarding what he had learned in the field of science.

In the first chapter, Feynman shared several significant events and stories of certain individuals—all of whom had molded him into the great physicist that he was.

One of them was his father who was quite instrumental in nurturing his curiosity about the physical world.

Another was his first wife Arlene, who was sick of tuberculosis. In fact, the

title "What Do You Care What Other People Think?" were the words Arlene used to tease Feynman with, whenever he had doubts about the potential of his scientific ideas. So hesitant was he that he would share these ideas with only a handful of people. He was always concerned about what others would think.

Feynman also shared his thoughts on the impression that men and women of science are not skilled communicators. For him, it is not a valid reason not to teach excellently. He added that "bad teaching and lifeless explanations" should always be corrected.

Also discussed in his book is the significance behind the thorough research being conducted by scientists.

The second chapter of the book dubbed "Mr. Feynman Goes to Washington Investigating the Space Shuttle Challenger Disaster" could be considered as a very important one. Here, Feynman provided a detailed narration about his involvement in the investigation of the explosion of National Aeronautics and Space Administration (NASA)'s Space Shuttle "The Challenger" in June 28, 1986. The painful tragedy claimed the lives of five astronauts and two civilians.

Immediately, the Rogers Commission was formed to investigate the particular incident. Feynman, being one of the members of that group, played a vital role during the investigation which centered on the failure of the O-rings in sealing a joint on the right solid rocket booster, which allowed pressurized hot gases to create flame and have contact with the adjacent external tank, causing structural failure.

During the televised hearing, he did an *impromptu* experiment showing the process by which O-rings in the shuttle's rocket boosters failed because of cold temperatures in the morning. In order to prove his point, he clamped a material from a shuttle O-ring

and dropped it in ice water. At the mere temperature of a cold soda, the rubber became rigid and dented.

How Feynman described the science and policy in relation to the Commission's quest to know the cause of the Challenger explosion is indeed intriguing. Feynman played the role of a fearless detective, narrating everything that he has to say about the poor communication system within NASA.

According to Feynman, the conclusion was obvious; the gasket material lost its ability to seal in the extreme space cold weather, like what happened to the O-rings on the shuttle's right solid rocket booster.

Feynman disagreed with NASA's method of calculating the safety of the booster rockets rubber seals which resulted into a disaster. It was later dismissed by NASA as soon as the erosion was discovered—because, as a matter of fact, these seals were not designed to erode.

Feynman's style of writing is intensely moving and sometimes, humorous. He is definitely an author who knows how to engage his readers to his story. His use of words is exemplary, particularly in the second chapter where he made use of words and sentence structures that would enable readers to appreciate and empathize with the ongoing investigation.

To those who are looking for books that will bring them heightened appreciation of the importance of science and history, this book is highly recommended. Feynman's excellent storytelling has turned this book into a wonderful masterpiece.

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.

“HER”

By **KARL RAVEN RAMON**

S&T Media Service, *DOST-STII*



A FICTIONAL operating system (OS) named Samantha is the subject of this 2013 film by Spike Jonze.

Voiced by Scarlet Johansson, Samantha who also calls herself Theo, is owned by near-divorced middle aged man guy Theodore Twombly, portrayed by Joaquin Phoenix.

The 21st century already introduced Artificial Intelligence (AI) like Siri for Iphone, Ok Google for Android, and Cortana for Windows. Now, all of these are considered outdated compared to Samantha, the future of AI's.

This OS can perform all the roles of existing AIs. Moreover Samantha is considered not just an operating system theoretically but another consciousness, a consciousness which is relatively close to humans. Hence, it is not limited to sending messages or emails, creating reminders, alarms and notes, organizing files, contacts and giving directions. People can actually talk to Samantha, crack a joke with her, tell stories to her, be her friend. She even responds to dirty talks.

Samantha is also a letter writer. In this hyper futuristic film, people do hire writers to create intricate and sweet-sounding letters.

Almost everything in the setting are advanced, from virtual gaming up to writing

letters – they are all voice activated. No need for keyboards and mouses in the movie; instead, the characters just give commands to their devices and voila! The device simply writes what the character just said.

That's the secret of Samantha getting attached to Theodore, just like persons dating. As Theodore uses Samantha in a regular basis, both of them find themselves interested and hooked on each other.

Is this possible? A human - computer relationship? In this neoteric world, computers and mobile devices have replaced humans in performing certain tasks. Now, we share our work with computers, heightening the tendency of human-computer interaction. As of now, technologists focus on the benefits of an operating system as a virtual assistant as in the case of SIRI, Cortana and Google. Now it is virtual and personal at the same time. It can see its surroundings via webcam and speak through a bluetooth-enabled earpiece.

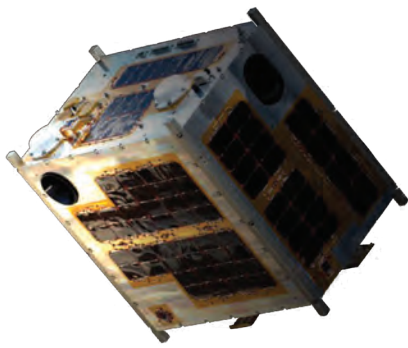
Martijn van der Spek, co-founder of Sparkling Apps, a company developing speech recognition services and envisioning the next-generation personal assistant said in an interview from readwrite.com that virtual personal assistants require massive amounts of server power, and smaller startups with AI solutions. He also explained

that overloading of information can lead to performance issues with the servers and while deleting some data, the OS can suffer acute amnesia.

Meanwhile Peter Mahoney, chief marketing officer of Nuance, a company that builds virtual assistant capabilities said in readwrite.com that structured content will happen first versus things that are less structured—those will be more complicated to figure out. In short, 21st century AIs are likely to answer simpler queries and commands like reserving a date, finding locations etc. On the other hand, AIs such as a fictional OS1 that can actually perform personal interaction with humans is still under study.

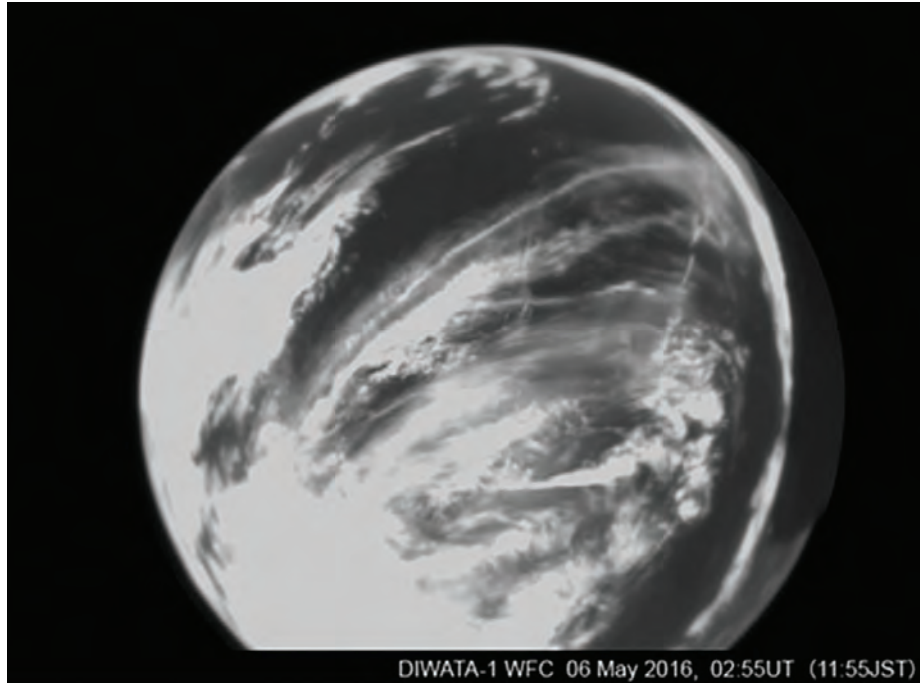
Just like what we're told, everything is possible with science. Always remember that all of the technologies we have today constitute yesterday's science fiction and science fiction of today may be tomorrow's reality.

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.

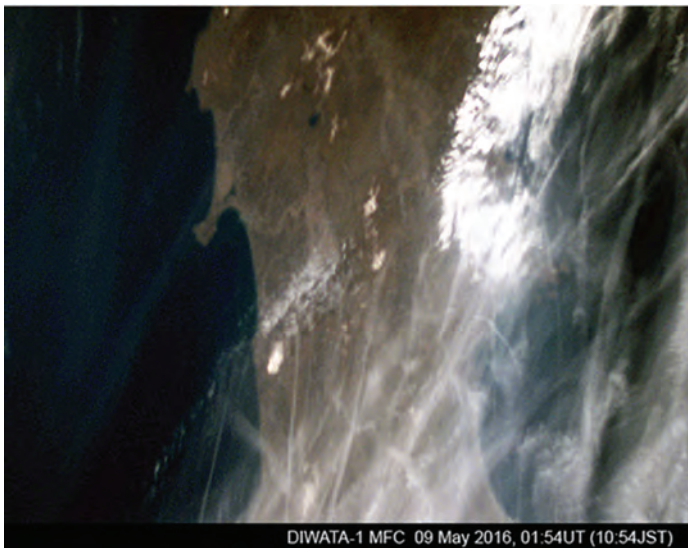


Images from **DIWATA-1**

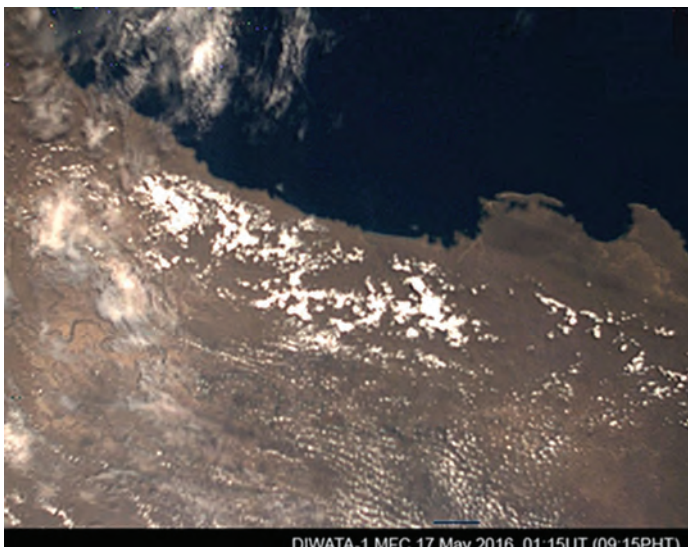
DIWATA-1's four onboard
cameras for Earth observations,
produced these test images



An image of the Earth taken by the fish-eye monochrome wide-field camera on Diwata-1 captured at 11:55 Japan Standard Time on May 6, 2016.



Left: An image of the Tohoku area of Japan taken by the medium field-of-view color camera on board Diwata-1, captured at 10:54 Japan Standard Time on May 9, 2016. **Right:** A projection of the MFC image of Picture 2 on a geological map of Japan's Tohoku region.



Left: A test image of the province of Isabela in the island of Luzon, the Republic of Philippines, taken by the medium field-of-view color camera (MFC), captured at 09:15AM Philippine time on May 17, 2016. The test image captures a portion of the coastal seaboard of Isabela province, which includes parts of the municipalities of Maconacon, Divilacan, and Palanan. **Right:** A projection of the image on the left. While taking this picture, the satellite was moving over Luzon island and was looking down vertically at the target area, with the pointing control toward the center of the Earth.

Source:
http://www.tohoku.ac.jp/en/news/research/first_philippine_microsatellite_diwata_1_successfully_captures_images.html

**Partake in the making of the
Philippines' scientific history.**

**Contribute in the continuing improvement
of the country's rich research culture.**

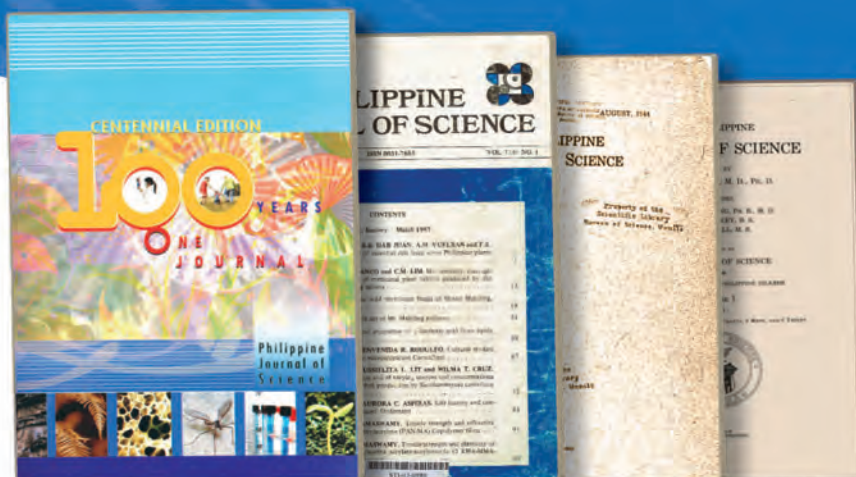
PUBLISH your research in the Philippine Journal of Science (PJS),
the country's oldest scientific journal since 1906.

PJS accepts scientific articles on a wide range of topics:

- Natural sciences
- Applied sciences
- Engineering
- Mathematics
- Computer Science
- Social sciences
- Review papers are also welcome

All paper submissions shall undergo **RIGOROUS PEER REVIEW**.
Authors are given the opportunity to publish their work in a Thomson Reuters
and Scopus-indexed journal **WITH NO PAGE CHARGES**.

**NOW ON
ITS 110th
Year**



You may submit your manuscript and other requirements to the PJS Editorial Office via philjournsci@gmail.com.
For further information on submission and subscription, visit the PJS website at <http://philjournsci.dost.gov.ph/>



DEPARTMENT OF SCIENCE AND TECHNOLOGY

JUAN SCIENCE ONE NATION

2016 NATIONAL SCIENCE and TECHNOLOGY WEEK

2016 NSTW

Bicutan Science Community

DOST Complex, Gen. Santos Ave., Bicutan, Taguig City (25-29 July 2016)

Manila Science Community

SM Mall of Asia Atrium, Pasay City (25-29 July 2016)

Quezon City Science Community

Science Garden Complex, Agham Road, Quezon City (25-29 July 2016)

Los Baños Science Community

PCAARRD Complex, Los Baños, Laguna (25-29 July 2016)

DOST Regional Offices

(25-29 July 2016)

For more details,
please visit: nstw.dost.gov.ph or email us at: 2016nstw@gmail.com
or call: **837-2191 to 94**



FREE ADMISSION
