ISSN 0116-7766

VOL. XXXII NO.2

APR. - JUN. 2014

S&T POST

DOST, partners step up disaster preparedness efforts through *Iba na ang panahon*

Saving lives thru science

Boosting enterprise dev't via S&T

Demystifying cocolisap: Using science-based know-how to combat pest

Experts underscore importance of early warning for calamities

www.dost.gov.ph

A safe community

Our reality as a nation is one that is touched by the elements, one that is shaped by nature. Our archipelago, with its 7,107 islands, is within the so-called 'ring of fire' and along the mysterious 'typhoon belt'. Within these islands are scenic volcanoes that act according to their temper and picturesque coastlines that are, unfortunately, prone to vicious storm surges. Yes, tsunamis may unexpectedly come depending on offshore tectonic activities and landslides may shock the population depending on their origin – which can either be earthquake or rain induced.

All these natural hazards, including those that are anthropogenic, are what eat up a great deal of time and resources on the part of both the government and the private sector. Another grim reality is that no single entity has the power to face the fury of these disasters head on.

For these reasons, the Department of Science and Technology (DOST) has initiated the **Iba na ang Panahon: Science for Safer Communities** (INAP: S4SC) project in order to share valuable information and available tools on disaster preparedness. Here, Science Secretary Mario G. Montejo has directly involved himself, especially in the 3-month, 17-region information, education and communication campaign from March to May 2014. Admittedly, one of the truly admirable characteristics of the project is its 'charisma' – making every partner not only appreciative but fully active as well. This can be described as convergence at its best.

At the helm of the project is Assistant Secretary Raymund E. Liboro who secured solid partnership with the different DOST and other government offices: PHIVOLCS, PAGASA, STII, PCIEERD, DOST ROs, Project NOAH, DILG, LGA, NDRMMC, OCD, MMDA, among others. It is noteworthy that a great number of local chief executives (governors and mayors) and their disaster risk reduction management (DRRM) officers were in attendance during the regional IECs. Also, the concept called 'disaster imagination' was explained fully for the LCEs and DRRM officers to appreciate and use them in their respective disaster management plans.

The project hopes to cover the end-to-end process for science-based and scenario-driven community disaster preparedness – from early warning and early action – to achieve minimum loss and establish a quick recovery system.

Yet, project implementors said that what remains as the best strategy is for everyone to work as one.

For this, the editorial team of S&T Post has decided to feature in its 2nd Quarter issue the major events and sidelights of INAP: S4SC so that our readers would somehow understand not only the project but also the value of early warning and early action as far as hazards are concerned.

Finally, stories relating to the forthcoming 2014 National Science and Technology Week (NSTW), the biggest annual S&T event in the country with the theme "Philippines: A Science Nation Meeting Global Challenges," are likewise featured to give our readers a glimpse of what is in store for everyone.

Aristotle P. Carandang, PhD

S&T POST

VOL. XXXI No. 2

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

DEPARTMENT OF SCIENCE AND TECHNOLOGY

VOL. XXXII NO. 2
SECOND QUARTER 2014

S&T POST

CONTENTS

4 A 'pack of hope' for hungry disaster victims
5 Lowly tiesa gets boost as natural food coloring
6 Metals industry gets additional push
7 Gamma-ray scanning technology now available at DOST
8 Pisay Central Luzon's water filtration project wins in Hyundai New Thinkers Spotlight
9 "Library in a Box" now serving Marikina students
10 Building Back Libraries...reaches out to schools in Yolanda affected areas
11 Ten Cities Commended for E-Readiness

SETUP

12 From researcher to entrepreneur How SETUP helped build a "yam-my" venture
14 Bicol's pili nut to level up with opening of service facility
15 Toll packaging center to help Romblon startup entreps
16 First Food Processing Innovation Center opens in Davao City
17 Indigenous Zambo tribe benefits from wine and vinegar factory
18 SETUP's role in Apo ni Lola's aim to be Davao's Mother of Food Tourism
20 Rise Mo Women's Group rises to the occasion
22 When "balut worries" go kaput

DISASTER PREPAREDNESS

24 Saving lives thru Science
32 DOST, partners step up disaster preparedness efforts through "Iba na ang Panahon"
33 CALABARZON maps strategy against future calamities
34 S4SC in Northern Mindanao
35 No fault does not mean safe - PHIVOLCS
36 Experts underscore importance of early warning for calamities
37 Bohol, Cebu, rest of Central Visayas brace for future disasters
38 DOST calls for more disaster response leaders in Zamboanga Peninsula
39 DREAM plane to fly in ARMM to chart hazard map
40 S4SC in CARAGA
41 More collaboration between DOST and other gov't agencies pushed
42 Cordi folks' disaster preparations get underway
43 S4SC in Cagayan Valley
44 LiDAR technology sets sights on Davao Oriental
45 Bicol's disaster preparedness highlighted in Iba na ang Panahon
46 Eastern Visayas gears up for another Yolanda
47 Media practitioners urged to be instruments in sharing weather info
48 Iba na ang Panahon does "whole of society" approach in NCR leg
49 Solidum sings the hazards
50 24/7 community preparedness, 0 casualty: The Tulang Diyot experience

OUR COVER

A permanent fixture in Philippine streets, the umbrella serves as a shield against the heat and the rain. It is a symbol of protection and preparedness. These are the main thrusts of DOST's nationwide roadshow simply called S4SC, or Science for Safer Communities. DOST hopes that LGUs will use their learnings from S4SCs as a strong, solid protection against natural calamities. (Art: James B. Intia / Concept: Espie Angelica A. de Leon)

52 S4SC: blood, sweat, tears, and cheers
57 DOST vows to improve delivery of weather information
58 Hazard maps for a safer country
59 Predictive damage and business continuity for pro-active disaster preparedness
60 DREAM come true: DREAM-LiDAR wins geospatial excellence award
61 Marikina receives 20 MOSES tablets

NSTW 2014

62 Science Nation
64 AGRICULTURE-Demystifying Cocolisap: Using science-based know-how to combat pest
66 ENTERPRISES - Boosting enterprise dev't via S&T
67 INDUSTRY - The Philippine Aerospace Industry: Now looking up
68 IT-BPM - Closing in on 2016 targets
69 E-GOVERNANCE - Better government services with e-Government
70 HEALTH - FNRI, partners unveil Pinggang Pinoy
71 EDUCATION - More scholars, Stronger pillars
72 DISASTER PREPAREDNESS - Science nation on disaster mitigation and preparedness

HEALTH

73 "Organs on chips" to revolutionize drug development
74 Bikini beauties in nutrition crash course
75 Genomics research hub to rise in UP Diliman
76 Secrets of the sweetest and juiciest mangoes revealed
77 Summer is the best time to fight dengue mosquitoes, DOST study shows

AGRI

78 PCAARRD-SENASA collaboration pursued
PBSAP now includes agrobiodiversity and urban biodiversity

FEATURES

79 C'EST la vie: How DOST helps rebuild lives of Yolanda victims
80 Nine fun ways to learn about the environment

WHO'S WHO

83 New regional director of DOST VII
84 Trono, Alcala, Barba bolster Phl's roster of National Scientists

FOREIGN NEWS

87 Are emotions for robots possible? No? Think again.
Breakthrough Prize honors mathematicians

BOOK REVIEW

88 "What the dog saw" by Malcolm Gladwell

MOVIE REVIEW

89 Transcendence, rising through technology singularity

A 'pack of hope' for hungry disaster victims

By MARIA THERESSA A. RONATO
S&T Media Service, *DOST-STII*

After a calamity, preparing food might be impossible due to loss of electricity, gas, and water. Worry no more because the Packaging Technology Division of the Department of Science and Technology-Industrial Technology Development (DOST-ITDI) developed a technology which will lessen the agony of every disaster victim. The ready to eat (RTE) chicken arroz caldo was developed to give immediate satisfaction to the hunger of every disaster victim. ***(Photos by Ceajay Valerio, S&T Media Service, DOST-STII)***

MANY DISASTERS have already happened in the country with the Bohol earthquake and typhoon 'Yolanda' as the most recent. Disasters left the country with many lessons learned. After 'Yolanda' for example, many victims were reported to have no food to eat for many days. Preparing food was impossible with no electricity, water and gas in the disaster zone.

The disaster victims' real need is food that can fill their hunger and doesn't need any elaborate preparations. Generally all emergency food such as canned foods, noodles, coffee, rice, crackers stockpiled by the local governments and the Department of Social Welfare and Development (DSWD) and distributed to the victims, require water and heat which may be unavailable.

According to Daisy Tañafranca, head of the Packaging Technology Division (PTD) of the Department of Science and Technology-Industrial Technology Development Institute (DOST-ITDI), there are three stages of providing relief foods:

First stage - Immediately after disaster, power, gas, and water are cut off. Survivors need food that can be eaten without drinkables and without cooking.

Second stage - Upon restoring power and other utilities, survivors can make use of emergency instant food requiring hot water and cooking.

Third stage - All utilities are back on line, allowing survivors to use cooking equipment and prepare food and ingredients as relief from outside the disaster zone. At this stage, nutritious foods or supplement are provided to survivors.

Considering said stages, Tañafranca's team developed a new technology that is ready to address the need of every disaster victim.

PTD developed a "pack of hope" which will lessen the agony of the disasters victims by providing them a complete meal in every pack. Said "pack of hope' is the ready to eat (RTE) chicken arroz caldo categorized as disaster food ready to eat without drinkables.

Tañafranca said the product 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 zones that cannot be reached by land because of damages.

Tañafranca's research team will do the field testing and validation study of the RTE chicken arroz caldo in collaboration with DSWD using its protocols.

PTD still has three RTE disaster preparation foods in the pipeline, said Tañafranca. One is the chicken rice meal which is in the process of validation. Another is the beef tapa rice meal which is in the development stage, and the corn soup which is in the process of shelf life study.

Tañafranca said that DSWD was receptive to the project and accepted chicken arroz caldo as disaster/relief food. "In fact, DSWD now prefers relief foods that are convenient to pack, ready to eat, does not require cooking, with a shelf life of at least one year, and chicken and fish as main ingredients." Tañafranca said.

Tañafranca also informed that the DSWD will fund the commercial production using toll packers' facility and stock them in the regions. "At least two companies are interested to produce the product for DSWD and at the same time commercialize the product under different brand name," she revealed.

DOST-ITDI's partnership with the private sector will be covered by a Memorandum of Agreement. *(With report from Reginald Roy U. dela Cruz, S&T Media Service)*

Lowly tiesa gets boost as natural food coloring

By DELIA DELICA-GOTIS
S&T Media Service, *DOST-ITDI*

COLOR ADDS life to the world, and to the food we eat. People think that food stuffs with bright colors are healthy, fresh, and surely delicious. Color also influences a food or drink's appeal, taste, quality, nutritional value, and commands market preference. This led to the discovery of food coloring coming from different sources – artificial and natural.

These realities plus the increasing clamor of consumers for natural and organic-based food stuffs over artificial and synthetic ones inspired the young food researchers at the ITDI (Industrial Technology Development Institute), Department of Science and Technology and started exploring the potential of Tiesa *(Pouteria campechiana)*, a locally grown fruit crop with a deep-yellow pulp and yellow-orange meat. Tiesa is an underutilized agricultural crop but its fruit was found to contain fair levels of ascorbic acid, is rich in niacin, and has a relatively high content of carotenoid, an organic pigment of yellow, orange or red color suitable for food application. Thus, a standardized procedure for the production of natural food coloring from Tiesa was developed. The produced natural yellow coloring can be a good alternative for the synthetic food coloring FD and C Yellow 5.

Supervising Science Research Specialist and Officer-In-Charge of ITDI's Food Processing Division Ms. Teresita Palomares said, "nowadays we cannot deny the importance of coloring materials being applied to food because of the many benefits it offers such as preserve the original food appearance even after processing and during storage; ensure color homogeneity of the product; intensify the normal color of food; protect the flavor and light susceptible vitamins; and make food look appetizing. And all these inspired us to develop one from an agricultural crop."

During the development process, Research Team Lead and Science Research Specialist II, Mr. Christopher Andrew G. Bilbao explained, "using Tiesa as the raw material, we standardized the methods of extracting and purifying its carotenoid pigments". Various parameters during extraction and purification were investigated and optimized (e.g., extraction solvent, temperature, time) to achieve the most efficient process.

"We employed solid-liquid extraction using various solvents typically accepted for food use," Bilbao said. "We then investigated appropriate carriers for the purified pigments to determine the forms of the food coloring that will be suitable for various food applications", he added.

Four materials were investigated as possible carriers for the pigments, namely: sunflower oil, an emulsifier mixture, maltodextrin and modified cornstarch. The natural food coloring developed in the emulsifier mixture was found most promising. It was then characterized and evaluated for its physico-chemical properties and acceptability in food application using calamansi juice. The results showed an enhanced yellow color on the product and no immediate degradation of the color was observed during processing.

In addition to the developed process, "other extraction techniques such as supercritical fluid extraction and ultrasonic-assisted extraction should be studied to develop more efficient and greener standardized procedures in the production of natural food coloring from Tiesa", concluded Bilbao. Likewise, other sources of natural pigments should be investigated to have more sources for natural colorants. *(With report from Christopher Bilbao)*

GOTIS

Metals industry gets additional push

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

DIE AND MOLD SOLUTION CENTER LAUNCHED. DOST Secretary Mario G. Montejo (middle) checks out the brand new, state-of-the-art machine for die making during the launching of the Die and Mold Solution Center (DMSC) held at the Metals Industry Research and Development Center in Bicutan, Taguig City. The DMSC is a one-stop center for die and mold fabrication, allowing for a shorter production turnaround time at a relatively lower cost, thus avoiding the previous costly practice of sending die and mold designs overseas for fabrication. The center hopes to create a significant impact on the local metals and allied industries as well as in the manufacturing sector. Also in photo are DOST Assistant Secretary Robert Dizon (left) and DMSC Project Leader Engr. Fred Liza. ***(Photo by Gerry Palad, S&T Media Service, DOST-STII)***

THE PHILIPPINE metals and manufacturing industry will now get a much-needed push toward global competitiveness as the Department of Science and Technology (DOST) launches the Die and Mold Solution Center (DMSC) – a one-stop solution for die and mold design and fabrication - during the opening of the 4th Metals and Engineering Week last June 16, 2014.

Housed within DOST's Metals Industry Research and Development Center in Bicutan, Taguig City, the DMSC is a project under the Department's Makinarya at Teknolohiya Para sa Bayan or MakiBayan, a program for empowering the local manufacturing industry by providing locally designed and developed manufacturing equipment and tools.

"State-of-the-art equipment, we have that. Competent personnel, we have that as well," emphasized DOST Secretary Mario G. Montejo as he described the newly launched facility and its relevance to local manufacturing.

Department of Trade and Industry (DTI) Secretary Gregory Domingo stressed that the launching of DMSC will translate to shorter turnaround times, greater savings and a more cost-efficient production process.

Die and mold fabrication is a key element of the manufacturing industry. Locally, it also presents a major capability gap. Previous industry practice involved local players sending their die and mold designs abroad for fabrication. Such service was not available in the Philippines, making it more costly for manufacturers and translating to lengthier production timelines. This gap has marred the growth of the metals and allied industries in the country.

Sec. Domingo suggested the replication of the DMSC in various other parts of the country such as Northern Luzon, Cebu, and Mindanao to allow industry players in these parts to gain access to quality fabrication services and further promote the growth and competitiveness of the local metals and allied sectors.

LAZCANO

Gamma-ray scanning technology now available at DOST

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

THE DEPARTMENT of Science and Technology - Philippine Nuclear Research Institute (PNRI) is offering its services using Gamma Ray Column Scanning Technology to assist the local industries, such as oil refineries and petrochemical plants, in the inspection and investigation of process vessels. This technology makes it possible to "see" inside a process vessel, such as distillation columns in refineries or petrochemical industries, and quickly identify its problems without interrupting normal plant operations. Such technique saves the client company time, money, and other resources.

Called density profile, the technique provides significant information on the condition of the whole process and the vessel itself. Engineers, using the technology, can identify damaged or missing trays and their positions, extent of flooding and its location, liquid weeping and foaming, liquid levels, and blockages, among others. Thus engineers and operators can determine the status of the column and consequently make arrangements for maintenance and troubleshooting to prevent emergency shutdown.

Since the process does not involve direct contact with the insides of the vessels, it also avoids potential corrosion, temperature or pressure problems.

This precision nuclear tool could prove useful beyond troubleshooting structural problems. The data gathered may also be used to improve the structures and processes of the plant, thus making them more efficient and reducing production down-time in cases of programmed shutdowns.

Meanwhile, process columns are crucial components in refining crude oil to turn it into valuable fuel, as well as in sustaining the plant's cooling systems, among others. Plant shutdowns for maintenance could cost around $1,200 per hour overseas, translating into millions of pesos in losses everyday for the local operators.

Prospective clients of the gamma-ray column scanning service range from members of the oil industry to operators of chemical plants.

Since the late 1990s, PNRI experts have provided gamma-ray services to major oil companies with local operations in the Central and Southern Luzon and local petrochemical companies. The Department of Science and Technology Grants-in-Aid project also kept the service and equipment upgraded with automated data-logging software and scanning systems.

For more information on gamma column scanning, please contact Section Head Adelina Bulos of the PNRI Isotope Techniques Section in Commonwealth Avenue, Diliman, Quezon City or call us at 929-6011 local 225 or 240. You can also send your queries at isotopetechnques@pnri.dost.gov.ph


DANTES

Why choose gammay-ray column scanning over other techniques

- It gives real-time information
- It uses a sealed radioactive material that is not affected by environmental conditions, an advantage in troubleshooting procedures.
- It is non-destructive and cost efficient as there is no need for column preparation, removal of insulations and shutdown of operation during investigation
- It reduces production downtime.
- It does not emit or produce any waste to the environment, making it safe to use.
- The advantages and benefits of gamma column scanning make it a favored procedure that is routinely used by competent industries in other countries to inspect and ensure the integrity and condition of their processes and vessels.

Pisay Central Luzon's water filtration project wins in Hyundai New Thinkers Spotlight

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

STUDENTS FROM Philippine Science High School – Central Campus have deviced a water filter system using a locally abundant material called Bentonite to source clean water from Abacan River for indigenous people.

With eutrophication and sedimentation prevailing in the Abacan River, Jan Louise Cabrera, Joshua Miguel Danac and mentor Karizz Anne Morante created a filtration system using Bentonite clay—a product of lahar erosion and an effective absorbent of dirt—to benefit the Aeta community in Barangay Sapangbato in Angeles, City Pampanga.

The innovation earned the Best Bayanihan Project title at the Hyundai New Thinkers Spotlight recently held at the Hyundai Center for Green Innovation in Angat, Bulacan.

Their project entitled "Bentonite Absorbent as a Technological Improvement of Sapangbato Waters" bested 19 other climate change intervention projects and bagged medals, certificates, and a cash prize of P90,000 for the team. The students were also awarded college scholarship grants courtesy of Hyundai Asia Resources Inc. (HARI) Foundation.

"Water scarcity is a serious problem that already affects more than 1.2 billion people in the world and climate change worsens this problem as excessive groundwater extraction causes land subsidence and increases vulnerability to flooding," said Cabrera and Danac during their project defense.

They said the filtration system can also serve as a model for other communities to adopt as an alternative way to source potable water.

The Hyundai New Thinkers Spotlight is the culminating phase of the Hyundai New Thinkers Circuit (HNTC) Program—a collaborative program of HARI Foundation and the Department of Science and Technology - Science Education Institute (DOST-SEI), together with the University of the Philippines' National Institute of Geological Sciences and Marine Science Institute. The program aims to develop students into future climate scientists and leaders.

Champions! The Team from Philippine Science High School Central Luzon Campus bag medals, certificates, a cash prize of P90,000, and scholarship grants for their project "Bentonite Absorbent as a Technological Improvement of Sapangbato Waters" during the Hyundai New Thinkers Spotlight held at the Hyundai Center for Green Innovation in Angat, Bulacan.

In Spotlight, 20 school teams showcased their innovative community development projects through exhibits and project presentations to compete for 20 scholarship slots. The Bayanihan projects were evaluated based on ingenuity, efficiency, sustainability, and the students' overall participation in the HNTC cycle.

Emilio Bernabe High School's Neal Renz Empleo, Sheena Coleen Labampa and coach Marites Banzon placed second with 90.1 points for their project "Motorized Boat Made of Junked Home Appliances as Alternate to Rubber Boat during Flood Rescue Operations".

Kasarinlan High School's "Hydrocab" project, Philippine Science High School – Main Campus' "Incorporation of Coir Geotextile, Aeration, and Rice Husk Filter into Localized Home Rainwater Harvesting", and Sisters of Mary School's "Electroschwartz Vertical Axis Wind Turbine" rounded up the top five.

Other winners were Marcelo H. Del Pilar National High School (rPLANT Project), Pateros National High School (Eco-Riders), Claro M. Recto Information and Communication Technology High School (5 E's in Waste Segregation), Mariveles National High School (Biodegradable Tamarind Seed-Based Plastic: A Remedy for the Changing Climate), and Valenzuela City Science High School (H2O FLOOD).

Students from said schools comprise the 20 Hyundai New Thinkers Scholars whose college studies shall be supported by HARI Foundation provided they choose a science course.

"Think of this event as a practice session for your would-be daily undertaking once you've become a scientist, engineer or a community leader," DOST-SEI Director Josette Biyo said as she encouraged the participants to choose science courses in college.


MELGAR

"Library in a Box" now serving Marikina students

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

RESEARCH WORK will be easier and much more exciting for students of Malanday National High School (MNHS) in Marikina City, with the recent installation of the Department of Science and Technology's (DOST) STARBOOKS digital library.

Dubbed as "Library in a Box," STARBOOKS or Science & Technology Academic and Research-Based Openly Operated Kiosk Station is a one-stop science and technology information source that works even without internet connection.

STARBOOKS is developed by experts at the Science and Technology Information Institute (STII) of DOST. It contains thousands of materials in text, video, and audio formats, featuring topics on food and nutrition, health and medicine, emerging technologies, energy, environment, livelihood technologies, investigatory projects and theses in different fields.

Dr. Teresita Fortuna, director of DOST-NCR led the memorandum of understanding signing with MNHS represented by head teacher Mrs. Salvacion M. Fernando together with Marcelino "Marcy" Teodoro, 1st District of Marikina representative, who requested the STARBOOKS for MNHS.

DOST-NCR Director Dr. Teresita Fortuna (center), Marikina 1st District Representative Marcy Teodoro (left), and Mrs. Salvacion M. Fernando sign the memorandum of understanding for the installation of STARBOOKS in Malanday National High School in Marikina City last April 7, 2014.

Dr. Fortuna encouraged the students present during the MOA signing to use STARBOOKS for their research. She reminded everyone that DOST will monitor if the equipment is actually being used by the students.

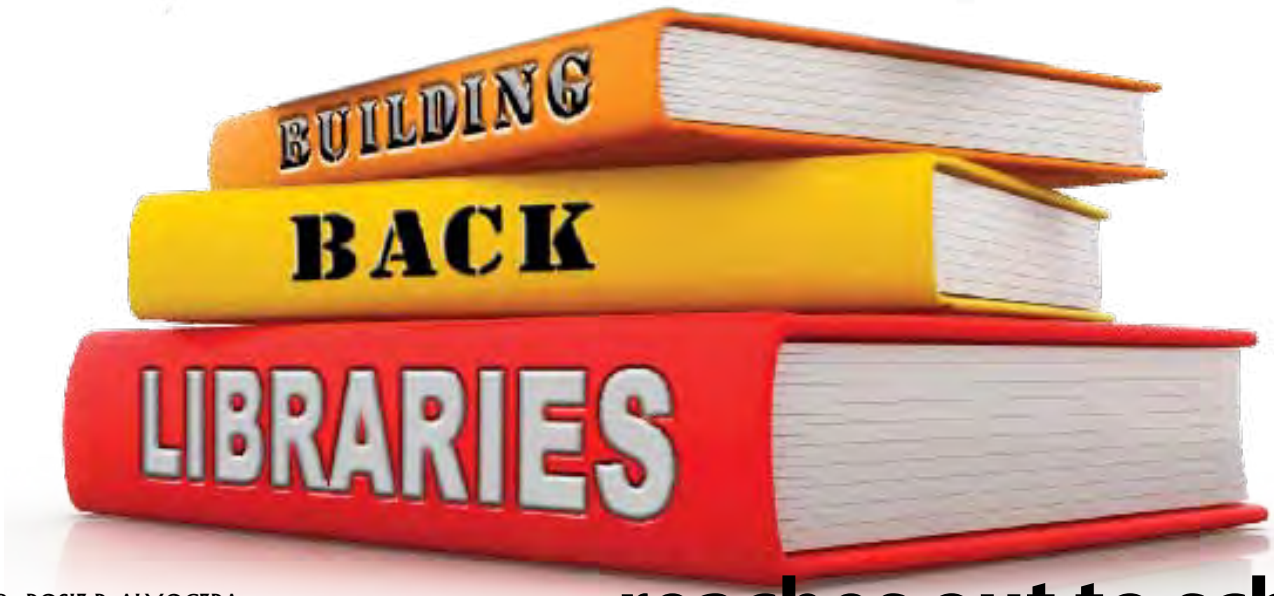
"We are very fortunate to receive this STARBOOKS. Magagamit po talaga ng mga bata (It will surely be used by the kids)," said Mrs. Lagrimas. B. Garcia, school principal. She added that they hope to put in additional computers so that more students can access STARBOOKS.

Victor P. Rebosada, teacher-librarian of MNHS said, "(STARBOOKS) will really help a lot in imparting of knowledge to our students. We are hoping that through this, we will be able to really focus on the science subjects."

DOST offers STARBOOKS to local government units, non-government organizations, educational institutions and private corporations. For more information, please log on to www.stii.dost.gov.ph or email starbooks@stii.dost.gov.ph.

LUMIOAN

Dr. Fortuna urges the students of Malanday National High School to use STARBOOKS for their research and school work. With her is Engr. Alvin Germino, DOST-NCR's cluster manager for Pasig, Mandaluyong, Marikina, and San Juan, who introduced STARBOOKS to the students. *(Photos by Ceajay N. Valerio, S&T Media Service, DOST-STII)*



...reaches out to schools in Yolanda affected areas

By ROSIE R. ALMOCERA
S&T Media Service, *DOST-STII*

BUILDING BACK Libraries for Typhoon Yolanda-Stricken Areas is a project of STII conceptualized by DOST Assistant Secretary Raymund E. Liboro and borne out of a desire to help Yolanda affected areas build back their washed out libraries.

On November 8, 2013, typhoon Yolanda, regarded as the most powerful storm to make landfall in recorded history, struck the Philippines. Leyte and Eastern Samar, with a combined population of 2.3 million, were the worst hit provinces. These areas experienced sustained winds of 270 kph, gusts of up to 312 kph, and a storm surge as high as 7 meters. Presidential Proclamation No. 682, dated November 11, 2013, declared a state of national calamity, affecting Samar, Leyte, Cebu, Iloilo, Capiz, Aklan, and Palawan.

The Building Back Libraries project aims to solicit books and other library resources from generous donors here and abroad. In line with this goal, DOST Secretary Mario G. Montejo quickly responded by issuing DOST Memo dated February 14, 2014 with the subject "Building-Back Libraries for Typhoon Yolanda Stricken Areas." In said memo, Sec. Montejo appealed for everyone's kindness and generosity to donate books (in print or in electronic format), videos, and other library resources and encouraged everybody to launch campaign activities for the said project.

Likewise, DOST Usec. for Regional Operations Dr. Carol M. Yorobe issued a Memorandum to DOST regional directors to submit the potential beneficiaries of this project. DOST-4B MIMAROPA Regional Director Dr. Josefina P. Abilay identified 21 schools as beneficiaries while DOST 8 Regional Director Engr. Edgardo M. Esperancilla, submitted a list for Leyte province where 831 academic institutions need assistance (712 elementary, 93 high school and 26 college).

Library materials donated by Don Alejandro Roces Sr. Science Technology High School in Marikina City.

Among the donor institutions are Don Alejandro Roces Sr. Science Technology High School in Marikina City, International Rice Research Institute, and DOST's Forest Products Research and Development Institute, Philippine Nuclear Research Institute, Information Communication and Technology Office, and Philippine Council for Agriculture Aquatic and Natural Resources Research and Development.

Ten cities commended for e-Readiness

By ROY E. ESPIRITU
S&T Media service, *DOST-ICTO*

TEN CITIES from all over the Philippines were recognized for their E-Readiness at the recently concluded 2014 E-Readiness Leadership Awards which recognize city mayors who are pioneering the adoption and strategic use of Information and Communications Technology (ICT) to enhance their delivery of government services, improve revenue/tax collection efforts and promote transparency in government operations. The criteria for the awards were taken from the results of the recently concluded E-Readiness Assessment Survey.

A special plaque of recognition was given by the ICT Office of the Department of Science and Technology (DOST - ICTO) during the awards ceremonies that took place on June 18, 2014 at the Hotel Intercontinental Hotel, Manila. Approximately 400 participants from various cities and municipalities attended the forum and witnessed the awarding ceremony.

The E-Readiness Survey is a joint collaborative project of the Department of the Interior and Local Government (DILG), DOST, and the Department of Trade and Industry (DTI), with support from the US-AID INVEST Project. DOST-ICTO carried out the E-Readiness assessment of the 143 cities which participated in the 2014 BPLS Compliance and E-Readiness Survey.

According to Bettina Quimson of the DOST-ICTO, "E-Readiness means that these LGUs are ready for E-Government. True E-Government will not only foster an efficient, transparent and effective government that our citizens need, it will also give the Philippines a competitive edge in the global marketplace, creating an investment environment that can help drive local and foreign investment in the country."

The framework to evaluate the e-readiness of local government units are based on several indicators. Among these are: (1) ICT Capability, (2) Technology Environment and (3) Web Presence Maturity. Other sub-indicators include the following: presence of an ICT Development Plan, internet connectivity, presence of an ICT/MIS unit. In general, E-Readiness means the level of preparedness of the LGU to implement ICT projects and to participate in major ICT project initiatives such as E-Government, Smarter Cities and other projects that aim to exploit the opportunities and potentials offered by the effective and strategic use of ICT.

Among the other cities recognized (according to ranking) were: San Fernando City, Pampanga, Makati City, Valenzuela, Mandaluyong, Cebu City, Balanga City, Bataan, Angeles City, Batangas City and Taguig.

ESPIRITU

DOST-ICT Office Deputy Executive Director Bettina Quimson congratulates Cagayan de Oro City Mayor Oscar Moreno, after Cagayan de Oro received the E-Readiness Leadership Award having ranked #1 in the E-Readiness Survey. Also in the picture are DTI Undersecretary Nora Terrado and DILG Undersecretary Austere Panadero.

From researcher to entrepreneur
How SETUP helped build a "yam-my" venture

By MARIA LUISA S. LUMIOAN
S&T Media Service, *DOST-STII*
(Photos by Gerry Palad, *S&T Media Service, DOST-STII)*

Purple yam brought by farmers is weighed in this platform scale.

Purple yam to purple yum. No artificial flavorings, preservatives, or colors added.

(Photos by Gerry Palad, S&T Media Service, *DOST-STII)*

The processing technique of purple yams is Engr. Ernesto de Padua's well-kept secret.

PURPLE IS the color of success for Engr. Ernesto de Padua, a retired teacher-researcher who was able to turn his own research into a successful venture with the help of Department of Science and Technology (DOST).

In 2004, shortly after retiring from Don Mariano Marcos Memorial State University (DMMMSU) in Bacnotan, La Union, Engr. de Padua established Chemfree Foods which specializes in processing purple yam into powder—sans artificial color and preservatives.

"Usually, when purple yam undergoes processing, it turns brown like chocolate. But (unlike other yam-based products) our product retains its purple color," explained Engr. de Padua.

The secret of his product lies in the multi-purpose dryer and processing technique which he himself developed. "My initial investment really is the development of this multi-purpose dryer," he said.

He revealed that he started developing the multi-purpose dryer back in 2000 when he was still with DMMMSU. In 2005, he availed a loan worth P 116,000 from Ilocos Consortium for Industry and Energy Research and Development (ICIERD) of the DOST to fund the construction of his multi-purpose dryer and the commercialization of food processing technology of yam.

This multi-purpose dryer developed by Engr. Padua ensures that ube (yam) retains its rich purple color.

Engr. de Padua's first client is a local biscuit company that manufactures ube flavored biscuits among other products. He was able to convince the company to try out his ube powder and initially supplied a total of 500 kilograms. Now, Chemfree Foods supplies an average of one ton of ube powder per month to this client alone. The product also found its way in Tagaytay City as an ingredient in tarts being produced by a local enterprise.

To further improve productivity of Chemfree Foods, Engr. de Padua once again sought the assistance of DOST in 2011, this time through the Small Enterprise Technology Upgrading Program (SETUP)—a program that aims to help improve productivity and competitiveness of micro, small, and medium enterprises (MSMEs).

With the P397,200 loan from SETUP, Engr. de Padua constructed another unit of multi-purpose dryer. He also purchased a table top scale, a continuous band sealer, and a platform scale.

Apart from financial assistance, DOST also provided training on Current Good Manufacturing Practices, and productivity and quality. On top of it all, DOST also gave Technical Advisory and Consultancy Services to Chemfree Foods. These include energy audit to assess the company's processes with the aim of reducing energy consumption, operating cost and waste generation; and manufacturing productivity extension to improve plant layout, waste management, production planning, and administrative and financial management.

Since receiving assistance from DOST, Chemfree's production upped from 800-900 kg of powdered ube per month to around 2000 kg per month.

De Padua also revealed that their next project is to renovate the plant in accordance to DOST's recommendations to improve the plant layout for better efficiency and productivity.

The family that works together

The company started by the patriarch has the full backing of his family.

Ervin, the eldest among the brood of five, is the manager. He is supported by Sharinelle who works as administrative assistant, and Israel who works production officer. Their youngest sister, Hazel, just resigned from work to devote her skills and time to the company.

Engr. de Padua's wife, Victoria, also looks forward to devoting more time to the company once she retires as a faculty member and researcher at DMMMSU.

Helping the community

Chemfree does not only provide a steady stream of income to the de Paduas. It benefits around 40 farmers in La Union and nearby Ilocos Sur as well.

Eduardo Macanas Sr., a farmer from Barangay Sengngat, Sudipen, La Union has been selling his produce to Chemfree for almost three years now. He used to sell his goods in Baguio but lamented that traders there only buy in bulk."Maymayat ditoy ta as-asideg ken makalakonak uray sagkabassit (It is better here because it's nearer and I do not have to sell in bulk)," he said.

Currently, Chemfree Foods has ten employees in the plant. De Padua also employs five workers in his farm from which he gets their buffer supply.

Chemfree is also an active private partner-cooperator in technology verification research development program on food processing of DMMMSU.

Bicol's pili nut to level up with opening of service facility

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

The pili nut, one of the all-time favourite local delicacies, is all set to delight more palates with the inauguration of the Naga City Pili Processing and Packaging Center last May 19, 2014 at the Jesse M. Robredo Coliseum. A partnership project of the Department of Science and Technology, Department of Trade and Industry, Department of Agriculture, and the City Government of Naga, among others, the center will be the service facility for Bicol Region's small entrepreneurs engaged in pili processing. Pili is one of the region's most famous culinary attractions. (Photos by Gerry Palad, S&T Media Service, DOST-STII)

BICOL'S PILI nut, one of the region's most famous products sought after for its sweet taste, crunchiness, and high nutritional content, is all geared up for sweeter prospects with the blessing and inauguration of the Naga City Pili Processing and Packaging Center last May 19, 2014.

Housed at the right wing of the Jesse M. Robredo Coliseum in Barangay Triangulo, Naga City, the facility is a collaboration among the Department of Science and Technology (DOST), Department of Trade and Industry, Department of Agriculture, City Government of Naga, and other public and private entities.

Speaking at the inauguration rites, DOST Secretary Mario G. Montejo said that the service facility is targeting the region's small entrepreneurs.

Through its array of services and equipment, the Center aims to lift the safety and quality standards of a product which has long catapulted Bicol into one of the Philippines' foremost tourist destinations known for its natural and culinary attractions.

Included in its range of food processing equipment are a stainless steel stationary oven, cooking vat, stainless grinder, blanching vat, testa remover, peeling table, draining sifter, electric dough mixer, and induction sealer, among others.

"Pili makers can use the facility to meet safety standards," said Sec. Montejo.

Meanwhile, Naga City Mayor John C. Bongat said "the partnership symbolizes the importance of capacitating and empowering small enterprises in the region."

At the same time, Sec. Montejo added that while the processing and packaging center focuses its services on small-scale pili processors, it is also developing among them the culture of self-sustainability instead of dependency. A large number of families in the region are engaged in the making and selling of various pili-based products such as candies, tarts and cakes. *(S&T Media Service)*

DE LEON

Toll packaging center to help Romblon's startup entreps

By BILSHAN F. SERVAÑEZ
S&T Media Service, *PSTC-Romblon*

QUALITY PACKAGING has just become the latest opportunity to Romblon-based food businesses with the opening of the Toll Packaging Center at the Department of Science and Technology office in Tabing Dagat, Odiongan.

The Center will assist start-up micro-entrepreneurs by providing packaging services such as label designing and short-run printing, product packaging and sealing services.

Equipped with hand and foot operated impulse sealers, band sealer, induction sealer, vacuum packaging machine and digital weighing scales, the Center will serve as the start-ups' one-stop-shop to quality packaging that will add value to their products.

Also available at the Center are consumable packaging materials.

Clients who wish to avail of product label designs can visit the center, submit a sample of their product and accomplish a form that includes product information and letter of request. The DOST-MIMAROPA's in-house artist will prepare design concepts to be reviewed and approved by clients.

DOST-MIMAROPA prides itself with its successful packaging and labelling project. One success story of its packaging program is Oriental Mindoro-based Merl's Suman sa Lihiya, now a household name with market presence in Metro Manila's malls. The firm, which uses eight cavans of *malagkit* rice daily for its product and employs 50 people in its suman business, is currently negotiating for an export market.

Rejano's Bakery in Marinduque that produces *uraro* (arrowroot) cookies also has market presence in Metro Manila malls due largely to its attractive packaging and labelling through DOST-MIMAROPA's assistance.

Induction sealer

Digital weighing machine

Vacuum packaging machine

Romblon's very own Lilec's Bibingkang Kanin is another hopeful company that is weaving its own success story. From selling an average of two *bibingkang kanin* wrapped in old cardboard boxes per day, the firm now sells an average of 16 to 20, and even goes as high as 80 boxes on special occasions with its new packaging. The *bibingkang kanin* is now packed in nicely printed boxes with the firm's name proudly emblazoned in the front. The current sales performance of the firm proves that packaging indeed is a boon for start-up micro-entrepreneurs.

In her message during the Center's opening, DOST-MIMAROPA Regional Director Ma. Josefina P. Abilay stressed the importance of packaging and labelling for MIMAROPA products to have a competitive advantage and gain market acceptance. With Odiongan Vice Mayor Roger Fodra, Corcuera Mayor Rachel Banares, Romblon Mayor Gerard Montojo, Romblon State University President Arnulfo De Luna and other well-wishers, Abilay opened the center early this year. She likewise distributed packaging equipment and supplies to the local government units of Romblon and Magdiwang to serve clients in Romblon and Sibuyan islands.

SERVANES

First Food Processing Innovation Center opens in Davao City

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

Department of Science and Technology (DOST) Region XI Director Dr. Anthony C. Sales signs the Pledge of Commitment during the launching of the Food Processing Innovation Center – the first facility of its kind in the country. The signing and recitation of the pledge was one of the highlights during the launching of the facility poised to catapult Davao's micro, small, and medium-based enterprises into world-class status. *(Photo by Gerry Palad, S&T Media Service, DOST-STII)*

THE DEPARTMENT of Science and Technology (DOST) launched the first ever Food Processing Innovation Center in the country last May 15, 2014 at the Philippine Women's College (PWC) of Davao in Matina, Davao City. The launch formally ushered a more dynamic food industry whose gains will cascade down to micro, small, and medium-sized enterprises, especially for those based in the region.

The P5.3M facility is a joint undertaking among the DOST, PWC, Department of Trade and Industry, Food Processing Association of Davao, and the local government of Davao City.

According to DOST Region XI Director Dr. Anthony C. Sales, the facility "aims to produce value-added agricultural and fishery food products by becoming the hub for innovations and technical support services for the food processing industry in Davao region."

Said support services include food testing, information, packaging and labeling design, consultancy services, trainings, and seminars. Through these services, the facility likewise aims to become a springboard for Davao's food processors to reach local and global standards in processing technology.

Housed within the PWC grounds at the heart of bustling Davao City, the center is GMP (Good Manufacturing Practices)-compliant and boasts of fabricated equipment by DOST's Industrial Technology Development Institute as part of the Department's High-Impact Technology Solutions program. These equipment hasten the production process and improve food and packaging quality in order to enhance product marketability and enable products to withstand transport.

Among these equipment are the vacuum fryer which allows frying of vegetables, root crops, mangoes , and jackfruit without eliminating their color and natural flavor; spray dryer which provides a faster and more efficient drying method and better control of powder quality; and the water retort which offers retortable pouch packaging as a low-cost, environment-friendly, and more convenient alternative. Retort refers to the method of heat sterilization that frees food products from pathogens, making the food shelf stable.

The Food Processing Innovation Center is also equipped with a vacuum evaporator for coco honey, tomato paste and condensed milk; freeze dryer for meats, fruits, and vegetables; vacuum packaging machine ideal for foods stored and packed in retortable pouches like cereals, nuts, cured meat, chips, and the like; and the immersion freezer which ensures faster cooling process.

The launch was highlighted by the recitation of the Pledge of Commitment by officials and representatives of the partner agencies.

Davao Region's pioneering Food Processing Innovation Center also serves as a common service facility for food technology students and professors.

Buug Subanen Tribe members welcome guests at the Pangase Rice Wine and Coco Water Vinegar Processing Facility with indigenous music.

Buug Subanen Tribe workers at the facility

Indigenous Zambo tribe benefits from wine and vinegar factory

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

THROUGH DOST-IX'S Community Empowerment Thru S&T (CEST) Project, the Buug Subanen Tribe in Zamboanga Peninsula was provided with livelihood.

CEST established the Pangase Rice Wine and Coco Water Vinegar Processing Facility for the Buug Subanen Workers Association via funding worth P 679,152. Technology training and equipment were also provided.

Among these equipment are stainless steel tables, drums for vinegar fermentation, two large vats, pots, stainless steel casserole, burners, acetator kit which shortens the fermentation period of vinegar. These were for vinegar processing alone.

Coco Water Vinegar

For Pangase Rice Wine production, P475,500 was provided to upgrade the processing facility. In addition, 300 jars were also provided.

The results of the intervention are remarkable: Sales grew, posting P26,000 in gross sales per month. Plus, the facility now employs 14 workers.

Every month, the workers produce one large Pangase Wine (4 gallons) at a selling price of P 2,000, 4 medium Pangase Wine (2 gallons) at P1,500 a bottle, 10 small Pangase Wine (1 gallon) at P1,000 apiece, 60 bottles of Spiced Vinegar (750 ml) at P60 and 40 bottles of Plain Vinegar (750 ml) at P20.

"The income goes to the Buug Subanen tribe workers," said Jocelyn Chua, association president and owner of the house and lot where the facility is located. Accommodation for the workers, she said, is free. The facility also includes a training area.

Livelihood and economic enterprise development is just one component of CEST for their target communities in the region. The others are health and nutrition, education and literacy, and disaster risk reduction and mitigation.

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

SETUP's role in *Apo ni Lola's* aim to be Davao's Mother of Food Tourism

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

Store Supervisor Imee Marie S. Añabesa (right) and production crew member May Ann Gutierrez. *Apo ni Lola's* staff now have something to smile about.

AFTER RECEIVING assistance from DOST in the form of a P448,000 grant for equipment upgrade plus training and consultancy, the staff of Davao-based Apo ni Lola, makers of mostly *durian*-based goodies and ice cream, have something to smile about.

"We expand our market every year. I can say we have a 100% increase in sales," enthused Store Supervisor Imee Marie S. Añabesa. When before they only had a few vans bringing tourists to their store, now they welcome 14-16 buses of tourists every day.

"If not for these equipment, maybe we would remain as that traditional *durian* candy factory," Imee added.

The equipment she is referring to are the Band Sealer and Coding Machine for packaging which they acquired through the grant. According to Imee, the Coding Machine, used for putting the expiration dates on the packages, is a lot better than the old stamp pads because the dates cannot be erased or tampered.

All in all, these DOST interventions have contributed to product safety, productivity and efficiency. Their packaging process is now faster, allowing them to churn out 70-80 production

Through DOST-SETUP's assistance, Apo ni Lola was able to acquire a Band Sealer (left) and a Coding Machine for the packaging process.

batches a day. One batch is equivalent to one tray of packed goodies which is equivalent to 24 large packs. Previously, they only came up with about 20 production batches in a day.

May to a private school. "I really work hard for Althea," she said. At Apo ni Lola, not only does she work hard for her and her family's future; she gets rewarded for her industry as well. Aside from being able to provide Althea May with a better education, mother and daughter also get to shop more often now, giving them more opportunities for bonding. Their usual jaunt: SM Lanang and Abreeza Mall in Davao City, where else?

pioneer in SME food tourism in Davao.

Imee explained, "SME food tourism is about the entire experience of visiting a food processing plant wherein you just don't get to buy the products; you also have the experience of seeing the production area."

Satisfied employees

To make sure they keep pace with customer demand, Apo ni Lola now has 30 people in its employ, as compared to the five workers they used to have – the fifth one being the owner himself, Arnel Raakin who is actually the "apo ni lola" being alluded to in the business name (His grandmother, Abondia del Puerto Raakin or Lola Abon, started making traditional *pastillas* in the 1950s. Later, she turned her sights on *durian* candy making).

One of the employees is May Ann Gutierrez, who has been part of the production crew for the past eight years. "As Apo ni Lola grew, our salaries grew as well," she related to S&T Post.

Because of the blessings, she can now afford to send her 10-year-old daughter Althea

Food tourism in Davao

The store is also expanding. "Right now, construction is progressing. So by the time [DOST] gives us the [next] training, we hope that everything is set. Our learning will then be hands-on because training will take place right here in our workplace," Imee stated. Previously, trainings were conducted at the DOST office.

These interventions and developments augur well for the future of Apo ni Lola especially in connection with their goal to become the

Inside the store is a viewing hall where visitors and buyers can watch how they make the products. While outside, Apo ni Lola easily beckons to both locals and tourists with a large, picture-pretty *durian* model for photo-ops – truly a fitting come-on for the treats that await them inside.

"What we want to give them is more than the candies, but the entire experience of having them here in Davao, hence our tagline 'Completes your Davao experience,'" said Imee.

Rise Mo Women's Group rises to the occasion

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

WHEN SUPER typhoon Yolanda struck parts of Visayas in November 2013, the Rise Mo Women's Group in Ormoc, Leyte was affected.

The roof of the building housing their Rice-Mongo-Sesame Ready-to-Cook food blend factory was partially damaged, allowing rainwater to enter the facility and destroy their raw materials, particularly the uncooked rice (*bigas*) and mung beans (*mongo*).

Rice-Mongo-Sesame Ready-to-Cook food blend is baby food that contains the essential fatty acids. The women's group, in fact, got their name from this product (Rise Mo = rice, sesame, mongo) which forms their livelihood.

As a result, the wet uncooked rice and mung beans were rendered useless and thus, were either thrown away or given to the local government for distribution to piggeries.

To have the roof repaired and finance a new supply of raw materials, the Rise Mo Women's Group members pooled resources from their own earnings. "Sayang naman kung hindi mabigyan yung mga order" (We already had orders and it would be a pity if we cannot deliver the products), said Luz Pernites, president of Rise Mo Women's Group which is owned by the local government unit.

It was a good thing their group venture is earning well, thanks to the assistance provided by DOST VIII – Grants-In-Aid and DOST-Food and Nutrition Research Institute's Complimentary Food Programs .

The assistance package consisted of the following: training on the processing of the product (RISEMO); provision of modern equipment and manpower training on the proper use and handling of these equipment.

The roasting machine (left) and the mixer are among the equipment acquired by the Rise Mo Women's Group.

These equipment are a roasting machine, grinder, mixer, and flour mill machine which turns the ingredients into powder form.

Acquisition of the equipment translated to greater efficiency in the cooking process and the weighing of raw materials. The new grinder, in particular, hastened the grinding process and produced mung beans which are more finely ground. The workers, which number to 20, also pay more attention to cleanliness now, making sure that materials and finished products are kept safe and uncontaminated.

Because of these, product quality improved, thus attracting more buyers for their unique and nutritious food blend. "Lumaki ang kita namin" (Our earnings grew), Pernites said.

Eight months after Yolanda, the factory, built in November 2012, is back on its toes as the Rise Mo Women's Group waits for the working capital to be provided by the local government as assistance for their post-Yolanda rehabilitation efforts. Pernites, for her part, is hopeful about the future. After all, Pernites and company did not have the factory and all those modern food processing equipment once. But once they did acquire these opportunities, their lives changed. Indeed, there is hope.

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

When "balut worries" go kaput

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

MARICRIS B. Huit and husband Calixto used to have three manually operated incubators for their *balut* processing business in Ipil, Zamboanga Sibugay which they call Marc's Balut Processing Facility.

Balut is a local street food – fertilized duck egg with a developing duck embryo inside – eaten right from the eggshell.

Being manually operated, the machines worked slowly and the products were not 100% *balut sa puti*.

Which was a pity because *balut sa puti* is what the locals crave for. *Balut sa puti* is a 17-day-old cooked egg. It is called *balut sa puti* because it is *balut* wrapped in white.

Thus, in 2012, the couple availed DOST's SETUP assistance. With a grant of P 349,000, the Huits were able to purchase an automated 18-rack bay egg incubator with a digital thermostat control system and a load capacity of 80,000 per cycle.

Aside from equipment acquisition, DOST's technology interventions also included manpower development training, process improvement, and system improvement for mechanized production.

After benefiting from this assistance package, Maricris' and Calixto's "balut worries" have now gone kaput.

The facility used to produce between 1,000-2,000 eggs a day. Now, it can churn out 5,000 quality *balut sa puti* eggs every day.

Sales have skyrocketed. Before, they merely posted average sales of 216,000 *balut* eggs per year and annual earnings of P 2.16M. Now, Marc's Balut Processing Facility has sold 360,000 eggs on the first quarter of 2014 alone, translating to a whopping P 3.24M in gross sales.

According to Maricris, orders come from Zamboanga City, Basilan, Dipolog, and Cagayan

Maricris Huit and the automated 18-rack bay egg incubator with a digital thermostat control system.

Inside the egg incubator

de Oro. "Through word of mouth, our customers increased, especially those in Zamboanga," she said.

In terms of manpower, from six workers, the business has grown to hire additional workers. Now, the facility has 22 regular personnel under its employ.

Despite the success, the Huits are not stopping at this point. They plan to buy another incubator to keep up with the demand, and to have their own poultry in order to have a continuous supply of fresh eggs. They have a few ducklings but during summer, the excessive heat prevents them from hatching a lot of eggs, which affects production. To augment their supply, they buy fresh duck eggs from Manila, Pampanga, and Nueva Ecija, said Maricris.

But for now, the family is certainly enjoying the fruits of their hard work and the DOST interventions.

"My husband and I were able to buy a car and we can now send our two boys to better schools." The Huit boys are 10-year-old Marc Alexi and 3-year-old Marc Audei. Their parents' *balut* business was named after them. "We also get to go on family outings more often now," Maricris shared. Their last family outing was in Dahilayan Adventure Park in Bukidnon which has the longest zipline in Asia.

"I feel that the business is more stable now," Maricris revealed. A stable family business combined with a stable family life equals nothing less than happiness.

Guests sample the delectable *balut sa puti.*

Saving lives thru Science

Dr. Aristotle P. Carandang takes a closer look at the national IEC campaign of the DOST dubbed "Iba na ang Panahon: Science for Safer Communities" - how it started, how it joined hands with other institutions, and the kind of hope it brings to an entire nation pummeled by earthquakes, typhoons, and a host of other calamities of constantly increasing strength.

By ARISTOTLE P. CARANDANG, PhD

So many stories have been told and a number remain untold. Most pictures are vivid yet some may be blurred. Donations from all corners of the country and the world continue to pour in while greedy souls enjoy the limelight. But the message is clear – lives were lost because of just one incident that has already carved its name in the annals of history. And Yolanda (Haiyan) has become a household name after the unforgettable onslaught in November 2013 in Central Visayas, claiming more than 6,300 lives with scores still missing.

With such a dreadful aftermath, no one can simply stay put. Everyone wants to share anything that can be shared – from food to clothes to money to what not. There was, of course, the influx of prayers from every religious denomination. After the confusion, the Philippines said 'Thank you" to the world.

Iba na ang Panahon

True, times have changed because of our ever-changing climate. *Indeed, Iba na ang panahon!*

Such line has created more than awareness among the DOST family and perhaps the entire nation. It was, in fact, able to formulate a science-based action on how to face disasters via an information and education roadshow called "Iba na ang Panahon: Science for Safer Communities" or INAP: S4SC.

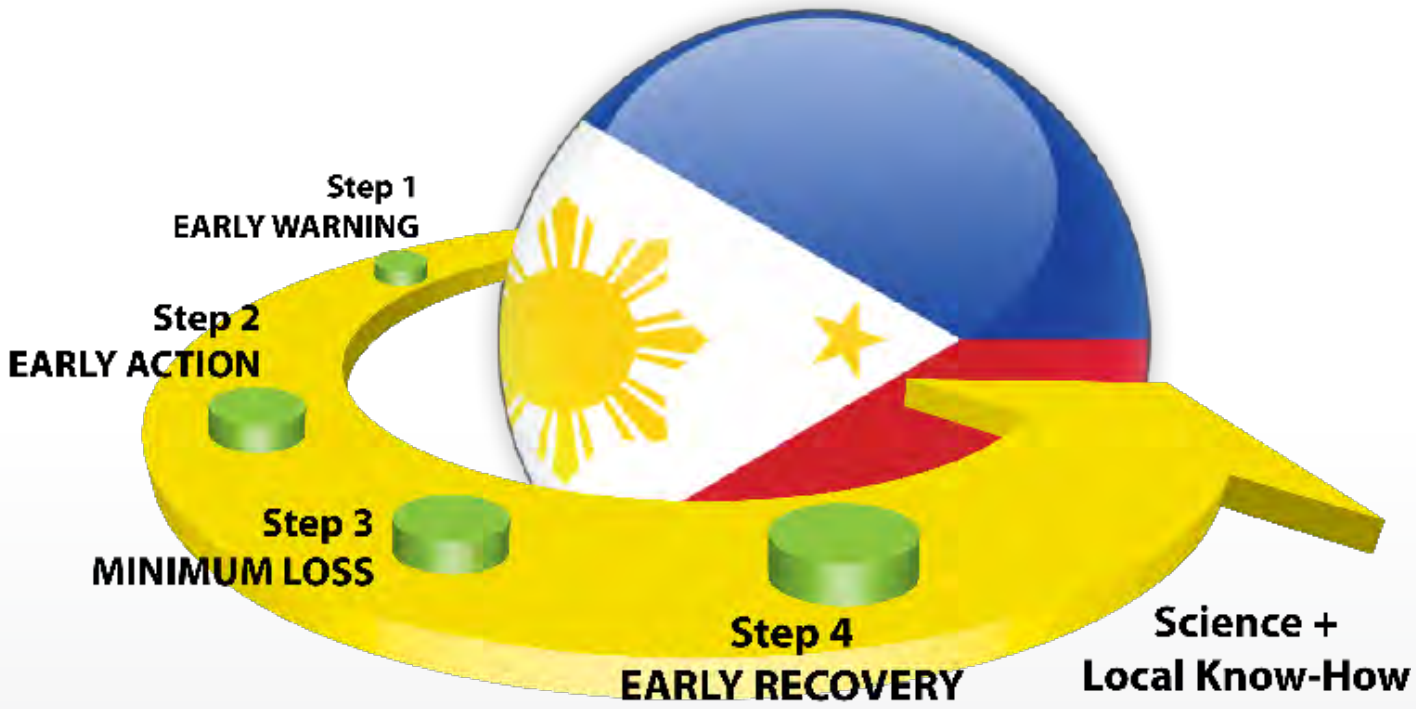
Through this campaign, the Department has tapped a number of agencies and offices under its wings: the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), Philippine Institute of Volcanology and Seismology (PHIVOLCS), Philippine Council for Industry, Energy and Emerging Technology Research and Development (PCIEERD), DOST Regional Offices (ROs), Science and Technology Information Institute (STII), and Project NOAH (Nationwide Operational Assessment of Hazards). Other strong partners are the Department of the Interior and Local Government, (DILG) and its Local Government Academy (LGA), Office of Civil Defense (OCD) as the implementing arm of the National Disaster Risk Reduction and Management Council (NDRRMC), and the Metro Manila Development Authority (MMDA).

Thus, S4SC is an example of converging government actions. It has become a national campaign on information, education and communication that deals with disaster preparedness.

According to DOST Secretary Mario G. Montejo in one of his regional engagements, "We hope to learn from each other how to spur teamwork between local and regional levels."

"DOST believes in the use of science to better understand and improve disaster planning and preparations at the national and local community levels."

-Mario G. Montejo
DOST Secretary



Steps formulated by the DOST in dealing with calamities

From March to May 2014, the team was engaged in a marathon-like roadshow covering the country's 17 regions and gathering local chief executives or LCEs (i.e. governors and mayors) and their disaster risk reduction management (DRRM) officers to help them address the perennial problem of the LGUs in responding to and mitigating the impacts of calamities via appropriate messaging. It is anchored on the fact that preparedness is still the best way to prevent terrible effects of disasters by way of early warning and early action.

True, it is now public knowledge that the impact of typhoon Yolanda was truly enormous and unprecedented worldwide; considering its toll on lives and properties. Post disaster assessments proved that while communities prepared for the typhoon, the destruction was beyond anyone's expectation. Filipinos are now one in saying that we no longer want to be trapped in the vicious cycle of destruction and reconstruction because of one disaster after another. It is a well-known fact that the Philippines is visited, on the average, by 20 typhoons per year; along with associated floods and storm surges as well as earthquakes, among others.

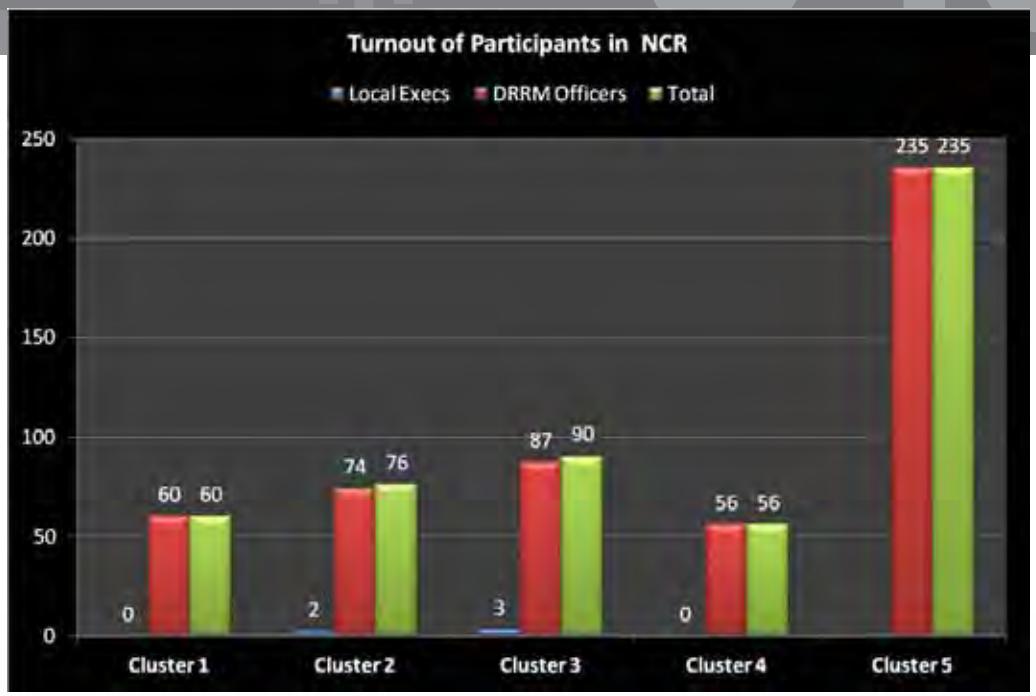
"The safety of your communities lies in your hands"

– Raymund E. Liboro, DOST Asst. Secretary/ S4SC Project Leader

Convergence and Science-based Formula

To deal with calamities, the DOST has formulated a science-based formula. This is Early Warning leads to Early Action; Early Action minimizes Loss; therefore, reduced amount of loss leads to Early Recovery.

Fortunately, the other departments are one with the DOST in supporting this principle of using science and technology coupled with local knowledge to ensure safer and disaster resilient communities.



Cluster 1 *(Valenzuela, Quezon City, Caloocan City, San Juan City, Bulacan)*
Cluster 2 *(Navotas City, Pasay City, Malabon City, Nearby provinces (Laguna & Cavite), LGU and House of Representatives Manila)*
Cluster 3 *(Pasig City, Marikina City, Rizal)*
Cluster 5 *(Whole of Society, Academe, Industry Associations, Foundations, NGOs, Civil Society Organizations, Utilities, National Government/GOCCs, Private institutions*

National Capital Region, 29-30 May 2014

The three-month national IEC campaign, which culminated in the National Capital Region leg on 29-30 May 2014, consisted of a two-day workshop for every region where S4SC shared information and tools that are crucial in preparing disaster risk plans for the participants' respective communities. These tools offered by the Department included localized geological and meteorological hazard maps, websites, and apps that LCEs and disaster managers can use. Each regional activity consisted of tabletop exercises for them to learn more about their vulnerabilities or hazard risks through the use of hazard maps. With these exercises, they formulated risk communication and disaster plans unique to their respective localities. A special package, on the other hand, is being designed for media practitioners for them to appreciate and learn how to properly disseminate disaster-related information. After the three-month regional IEC, the next phase of S4SC is monitoring and evaluation in order to know whether the outputs during the workshops are being used in one way or another or totally disregarded. This will be done in collaboration with the DOST, DILG, and OCD regional offices and will form part of the feedback mechanism. Expected outcome of the nationwide project is a safer, more prepared and resilient Philippines against disasters.

"Disasters will always be a part of our lives. It is not a question of "if" or "when." The question is "how." How prepared are we?"

- Renato Brion
DILG-NCR Director

Although there have been various initiatives on disaster preparedness, not much attention has been given to them. It was only after the onslaught of Typhoon Yolanda that most have become truly concerned. Such immeasurable devastation has provided a lesson for everyone. Thus, the DOST has come up with a four-point agenda in guiding community disaster preparedness: 1) Increase local risk knowledge. 2) Capacitate hazards monitoring. 3) Test warning and communications protocol, and 4) Build response capability in communities. The four-point initiative has become the core of the national IEC campaign.

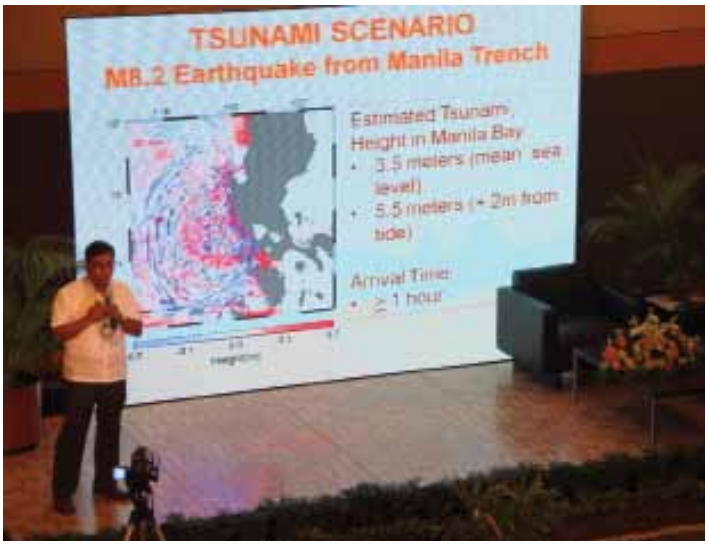
The slogan, *Iba na ang Panahon*, bears two meanings. One deals with the changes in our seasonal climate and weather patterns, with weather disturbances coming in more frequently and with greater intensity -- a possible effect of climate change. Experts say this is why Ondoy, Pepeng, Sendong, Reming, and what would otherwise be a harmless Habagat (southwest monsoon) happened one after the other.

The other change refers to the science-based tools now available, such as the latest high-resolution hazard maps which are good for understanding inundation, floods and storm surges down to the municipal and even up to the community level in *barangays*, and flood modeling solutions that allow our scientists to study hazards and bring better forecast warnings in order to give ample lead time for community folks to take necessary action. Through these tools, the DOST hopes to raise awareness and understanding among LCEs, DRMM officers, partner civil

TURNOUT OF PARTICIPANTS PER REGION

REGIONS		Governor	Vice Governor	Mayor	ViceMayor	DRRM/ MDRRM Officers	Total Number of Participants	MEDIA	DOST/ (DOST-RO STII PHIVOLCS UP-Dream Project Noah PAGASA PCIEERRD PSTC)	DILG/OCD (LGUs/ NGAs/ LGAs/ SUCs)	OVER-ALL TOTAL
CAR	Cordillera Adminstrative Region	1	-	24	1	123	149	24	41	47	251
Region 1	ILOCOS REGION	-	-	1	-	120	121	14	80	**	261
Region 2	CAGAYAN VALLEY	-	-	7	-	82	89	14	87	70	260
Region 3	CENTRAL LUZON	2	-	21	1	213	237	39	93	90	435
Region 4A	CALABARZON	-	-	29	-	192	221	28	104	40	393
Region 4B	MIMAROPA	2	-	3	-	101	109	7	55	24	195
Region 5	BICOL REGION	-	-	10	-	98	108	31	61	78	278
Region 6	WESTERN VISAYAS	-	-	10	2	157	169	16	66	40	291
Region 7	CENTRAL VISAYAS	7	-	42	4	139	186	28	52	61	327
Region 8	EASTERN VISAYAS	-	-	20	-	104	127	14	39	58	238
Region 9	ZAMBOANGA PENINSULA	-	-	27	-	300	327	37	59	68	491
Region 10	NORTHERN MINDANAO	-	-	11	-	146	157	49	91	20	317
Region 11	DAVAO REGION	-	-	26	-	294	320	30	41	46	437
Region 12	SOCCSKSARGEN	-	-	17	3	190	210	43	60	72	385
Region 13	CARAGA	1	2	12	1	108	125	15	136	**	276
ARMM	Autonomous Region of Muslim Mindanao	-	-	2	1	68	71	17	77	**	165
NCR	National Capital Region	5				277 +235*	517	317			834

*LGAs, NGAs, SCUs, etc.



society organizations, and even the local community media on different hazards.

These new tools were introduced in the workshops. The organizers believe that such information will spur the right disaster imagination to guide participants in their respective community plans.

Disaster Imagination - this concept, and its importance in planning, was introduced to participants in the exercises. After all, Albert Einstein once said that "Imagination is more important than knowledge."

"If we don't recover fast, government will fail. Livelihood will fail. And that is the bigger disaster."

– Dr. Renato U. Solidum, DOST-PHIVOLCS Director

In all 17 regions of the archipelago where DOST brought its information roadshow, Dr. Solidum stressed on one thing: Disaster Imagination.

Indeed, by anticipating the worst-case scenario, local chief executives and disaster managers can think and act two steps forward — using scientific data — and have a visual estimate of the potential impact. And the DOST's early warnings should do just that – to trigger disaster imagination that will prompt early action.

A public storm warning signal like a Signal No. 2 or 3, for example, must instantly activate the right disaster imagination so that the corresponding early action, be it evacuation or simply cascading information to the people, is taken.

The Yolanda experience has taught Filipinos a lot… what a Signal No. 4 typhoon could do to a coastal community and even across regions situated along its path. The Department believes that the painful experiences from this super storm are enough solid proof for Filipinos to take warnings more seriously.

The Workshops

The plenary presentations from experts tackled hydrometeorological and geological hazards in the regions. Knowledge of the local hazards easily leads to the visualization or imagination of the disaster's impact – hence, creating actionable disaster plans and encouraging closer coordination between communities in the region as well as with the national warning agencies.

The project team expects that participation in the disaster imagination workshops allows them to visualize the catastrophic impact of hazards based on the vulnerabilities of the location and population so they can seek better solutions and lower their vulnerability to disasters.

The organizers explained that partnership with regional and national experts is crucial to implement an end-to-end communications protocol. To be established is a feedback loop to ensure that information and early warnings will reach the intended audience and prompt proper action from the community.

With its new and sophisticated tools, PAGASA is expected to give dependable climate outlooks and forecasts for typhoons and storms, storm surges, floods and drought. PHIVOLCS on the other hand will be monitoring earthquakes, whether tectonic or

volcanic, and also warn against tsunami, when necessary.

"A more science-based DRRM planning approach should be a key feature in every community's overall plan to ensure its sustainability and continued growth."

- Dr. Vicente B. Malano
DOST-PAGASA
Administrator

Meanwhile, the Project Noah and DREAM continually build up on the present data and present them in a visual manner on a platform made available for everyone. Scientists of both Project NOAH and DREAM LIDAR group are working 24/7 to complement the data issued by our national weather bureau, DOST-PAGASA.

Their goal is to help extend the forecasting of weather and rain probability from hours to several days; and hopefully allow the concerned offices to provide better seasonal forecasts, which will be crucial to complement state, commerce, and agricultural planning in the Philippines, among other activities.

True, the Philippines is blessed with more than 7,100 islands. And each municipality, province and region has distinct landscapes and vulnerabilities. Through these workshops, the DOST and its project implementors and partners hope to learn from each other about how to build better teamwork between and among the national government, the local government units and their communities. Still, the best strategy calls for everyone to work as one.

With this unity cutting across community, provincial, and regional borders, S4SC hopes to cover the end-to-end process for science-based and scenario-driven community disaster preparedness, from early warning and early action, to achieve minimum loss and establish a quick recovery system.

CARANDANG

IBA NA ANG PANAHON

Science for Safer Communities

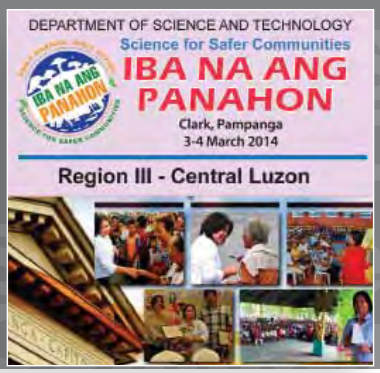
16,828
Kilometers

3
Months

17
Regions

These figures mean just 1 thing:
That in the summer of 2014, DOST and its partners DILG and OCD, traveled far and wide to spread to the entire archipelago the good news that Filipinos can better manage disasters and reduce risks with the help of science-based tools. And the S4SC team did this with the right timing - just before the onset of the rainy season.

Artwork by: Chez Fidelino



DOST, partners step up disaster preparedness efforts through *"Iba na ang Panahon"*

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

The Department of Science and Technology (DOST) in partnership with the Department of the Interior and Local Government and the Office of Civil Defense kicked off the first leg of their disaster information campaign dubbed "Iba na ang Panahon: Science for Safer Communities (INAP:S4SC)" last March 3 at the Oxford Hotel in Angeles, Pampanga.

A significant number of local chief executives and disaster risk reduction managers from Central Luzon or Region 3 came to attend the two-day event, giving the nationwide roadshow a great, promising start.

INAP's aim was to arm its participants with the latest information and science-based tools crucial in crafting local disaster preparedness and risk communication plans especially today when climate change continues to wreak havoc to the environment.

In his message during the opening ceremony, DOST Secretary Mario G. Montejo explained that INAP embraces the changes in our seasonal climate and weather patterns and the severity of the impact of weather-related natural hazards in the country while highlighting the availability of these tools.

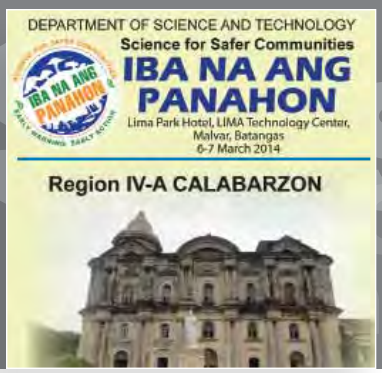
Among these tools are high-resolution maps and flood modeling solutions aside from already well-known technologies such as Google Earth, Project NOAH website, and weather information mobile applications. These cutting-edge tools allow scientists to bring better forecast warnings down to the communities.

Aside from Sec. Montejo, the opening salvo of INAP in Angeles, Pampanga was also graced by PHIVOLCS Director Renato U. Solidum, PAGASA Administrator Vicente Malano, and Mahar Lagmay of Project NOAH, among others. Both PHIVOLCS and PAGASA are DOST agencies while Project NOAH is one of the Department's banner programs.

The activity included workshops to help participants draw up scenario-based strategies and protocols in dealing with specific hazard risks in their localities.

Through the series of information activities, DOST and its partners seek to ensure that the early warnings provided by DOST agencies will be complemented with early action from the local government.

(Photos by Gerry Palad & Henry de Leon, S&T Media Service, *DOST-STII)*



CALABARZON maps strategy against future calamities

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

(Photos by Gerry Palad & Henry de Leon, S&T Media Service, *DOST-STII)*

Retrofitting, data gathering, soup kitchens and cadaver management, were among CALABARZON's action plans for future calamities during the second leg of "Iba na ang Panahon: Science for Safer Communities" (INAP:S4SC) held at Lima Park Hotel in Malvar, Batangas from March 6-7, 2014.

Local chief executives, disaster risk reduction managers and city planning officials of CALABARZON or Region IV-A formulated said action plans during workshop sessions after learning about 3D hazard maps, flood models, Project NOAH, mobile applications for weather information, and other science-based tools.

Citing the October 2013 Bohol earthquake as an example where several centuries-old churches crumbled, DOST Region IV-A Director Dr. Alex Madrigal stressed that attention should be given to the retrofitting of old and public buildings as well as historical structures.

At the same time, the Cavite delegation emphasized the importance of data gathering with regard to extent of calamity, maintenance of records, disaster analysis, and maintenance of law and order.

Cadaver management was likewise mentioned by the delegation from Quezon, citing Tacloban's "Yolanda" experience which saw the neglect of dead bodies lying on the streets.

Acknowledging that floods may affect more than 400 of the 674 barangays in Laguna, participants from the province included the construction and dredging of canals, creation of a Task Force for medical assistance, as well as the creation of soup kitchens in every municipality among their action plans. The soup kitchens will provide hot food for folks who lost their belongings, the group reported.

Meanwhile, participants from Batangas considered the possibility of a Taal Volcano eruption. According to them, a budget has already been allocated for the relocation of nearby residents to an area in Balete for which the National Housing Authority will provide assistance.

Participants' feedback

Participants expressed satisfaction over DOST's information and education campaign which included lectures and tabletop exercises.

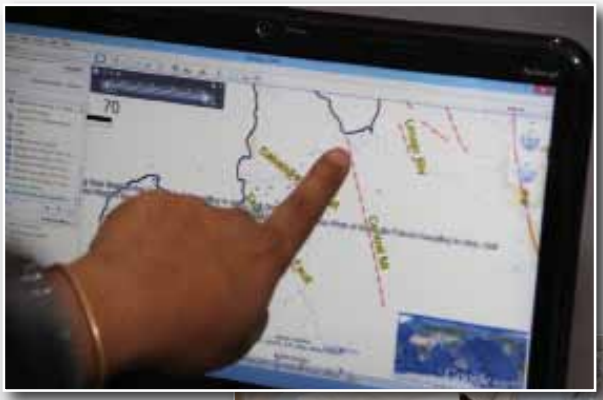
"What's good about it is that it will ensure the right procedures, right method, and right response in the event of a calamity," remarked OCD Region 4-A Director Vicente Tomazar.

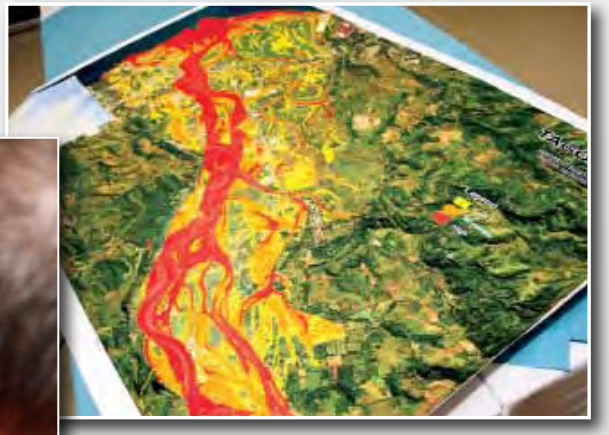
Patrick Go of Tayabas, Quezon said the tools he learned will help him in his job as IT Officer 1 at the City Planning Office. "I'll be able to use them in comprehensive land use planning and comprehensive development planning. They told us the maps are integral to these kinds of documents."

S4SC in Northern Mindanao

DOST Assistant Secretary Raymund E. Liboro and participants enact DROP, COVER and HOLD

About 300 local chief executives and disaster managers from Northern Mindanao attended the regional campaign in Cagayan de Oro City. Here, PHIVOLCS Director Renato U. Solidum also became a whistleblower. He blew his whistle as a cue for participants to drop on their knees and seek cover under the tables. DROP, COVER, HOLD – SOPs during an earthquake. His whistle blowing eventually became a regular feature in every regional leg of "Iba na ang Panahon."





(Photos by Gerry Palad & Henry de Leon, S&T Media Service, *DOST-STII)*

No fault does not mean safe - PHIVOLCS

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

The absence of an active fault in your area does not mean you are totally safe from earthquake hazards, Dr. Renato U. Solidum, director of PHIVOLCS, warned.

During the holding of "Iba na ang Panahon:Science for Safer Communities" in Region IV-B or MIMAROPA held in Romblon State University, Dr. Solidum cautioned that mainland Palawan has no active fault but it is still vulnerable to earthquake hazards particularly tsunamis. "Palawan can be affected by a tsunami coming from either side of the island," he said.

(Photos by Gerry Palad & Henry de Leon, S&T Media Service, *DOST-STII)*

The rest of the islands in the region namely Mindoro, Marinduque and Romblon are also vulnerable to tsunamis. Unlike Palawan however, the said islands are home to active faults.

The region was doused by an eight-meter tsunami almost 20 years ago when a 7.1 magnitude earthquake rocked the province of Mindoro in November 15, 1994, killing more than 70 people.

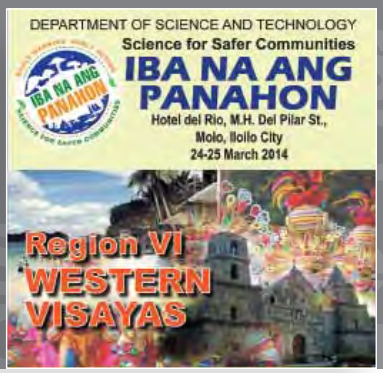
Because MIMAROPA is prone to geologic hazards, Dr. Solidum reiterated the need to be ready in case calamity strikes. He said inspecting houses, buildings, and structures and ensuring compliance to the Building Code will minimize loss of lives and properties during an earthquake. He also stressed the importance of identifying safe spots in the house or building, and knowing what to do during and after an earthquake.

Likewise, he said that coastal communities must be aware of the natural signs of tsunami—the shake (a felt earthquake), drop (a sudden change in seawater level), and roar (a loud rumbling sound). This is important since a tsunami generated by a near shore earthquake can come in as little as two to five minutes, he added.

Using the latest tools and technologies such as hazard maps, websites and apps featured in the workshops, the participants, composed of mayors and local disaster risk reduction officers, were able to create disaster risk reduction and mitigation plans for their localities based on a given scenario.

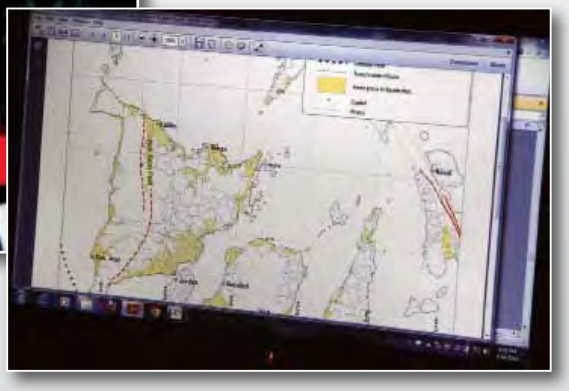
Administrator Mr. Adornhal Adoro of Cagayancillo, Palawan believes that the activity is of great help to their local government unit. "Kami po ay vulnerable sa kahit sa kaunting change ng climate lalo't ang highest point namin ay 200 meters above sea level lamang (We are very vulnerable even to very slight changes in climate with our highest point at just 200 meters above sea level)," he said.

Although Adoro has attended a similar activity in the past, he noted that the DOST activity is more "hands-on" and recommends that the activity be done annually and include barangays.



Experts underscore importance of early warning for calamities

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



Early warning leads to early response and early action that can save lives and prevent loss of property. This is DOST's key message as it takes its disaster preparedness campaign to Western Visayas.

Held March 24 at the Hotel del Rio in Molo, Iloilo City, the campaign converged mayors and disaster risk reduction officers from Western Visayas or Region VI to introduce participants to science-based information and tools that can be used for early warning of natural calamities.

"Applying science, we can draw up scenario-based strategies and protocols in dealing with calamities: from emphasizing early warning and early action to achieve minimum loss that can then lead to quick recovery," DOST Secretary Mario G. Montejo stressed during the event.

"We have warning tools to help you make decisions," he added.

Earthquake generators that can affect Region IV

Meanwhile, PHIVOLCS Director Dr. Renato U. Solidum informed participants that some faults in the area, such as that in Tablas, West Panay, Negros, Cebu, and Bohol, including Negros Trench, may produce earthquakes later in the region.

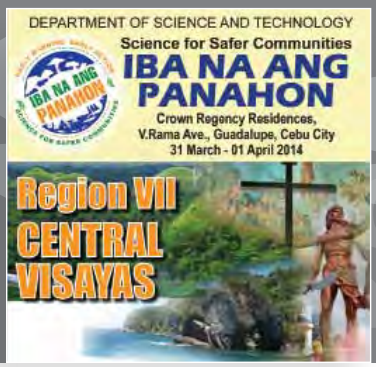
He also warned of liquefaction threats in Panay, as well as that of Kanlaon Volcano which "may have eruptions of small steam."

"But as of now, you may not have to worry about Kanlaon because it is on Alert Zero which means it is normal and no eruption is foreseen," he said and assured participants that PHIVOLCS has integrated volcano monitoring in Kanlaon, including monitoring via satellite.

Solidum reminded participants of these possibilities in the region as he stressed their roles as first receivers of information.

"As first receivers of information, you should be able to communicate down to local residents, the warning and the proper action that need to be taken," he told them as he emphasized the importance of monitoring, warning and dissemination in the early detection of hazards and keeping communities safe.

(Photos by Gerry Palad & Henry de Leon, S&T Media Service, *DOST-STII)*



Bohol, Cebu, rest of Central Visayas brace for future disasters

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

(Photos by Gerry Palad & Henry de Leon, S&T Media Service, *DOST-STII)*

Cebu joined Negros Oriental and Siquijor for the Central Visayas or Region VII leg of DOST's national disaster information campaign.

Among the participants of the campaign held at the Crown Regency Residences in Cebu City were Mayor Juliet B. Dano of Sevilla in Bohol and Hermogenes Manengo of the Municipal Disaster Risk Reduction Management Council in Carmen, Cebu.

Mayor Dano and Manengo, as well as the rest of the participants, sought to learn the lessons of the past and find workable solutions to future disasters via the two-day event.

"We really need hazard mapping in our town," said Mayor Dano who admitted they did not have any sort of hazard maps in Sevilla. "Later on, hopefully I can develop an IT department," she added, stressing the importance of information technology specialists in their office who can handle such tasks for early warning and early action against disasters.

Sevilla is listed among 17 Bohol towns heavily affected by the magnitude 7.2 tremor that rocked parts of Visayas in October 15, 2013 – said to be the deadliest in the Philippines in 23 years with an energy equivalent to that of 32 Hiroshima bombs. The mayor related that some public markets and barangay halls in their town were totally damaged, roads were destroyed, and mountains split. The latter led to the death of one person whose house stood at the side of the mountain. The body was not recovered until 2-3 days after the earthquake.

Manengo echoed Mayor Dano's statement. "Alam na natin yung mga calamity areas kasi mayroon na tayong mapa ng mga areas na delikado. Natutunan rin natin na mayroon nang NOAH. (Now we know the calamity areas because we now have maps showing which areas are vulnerable. We have also learned about Project NOAH)," he said.

DOST calls for more disaster response leaders in Zamboanga Peninsula

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

(Photos by Gerry Palad & Henry de Leon, S&T Media Service, *DOST-STII)*

DOST Assistant Secretary and DOST-STII Director Raymund E. Liboro called for more disaster response leaders in the Philippines amidst the increasing frequency of natural calamities.

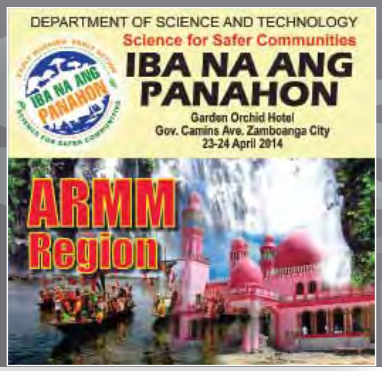
Asec. Liboro said that although mayors and organizations committed to disaster response stand at the frontline of disaster management, this does not exempt any other member of society from becoming a responsible disaster leader. He explained that mayors need responsible barangay chairmen and other dedicated people working under their stewardship in order to effectively carry out their tasks when disasters occur.

"Our message here is that disaster management or disaster response is everybody's business. We're providing tools that they can use – for them to lead their families, to lead their streets to safety," Liboro remarked to a crowd composed of national and local media men.

Asec. Liboro made his call during the press conference for the Zamboanga Peninsula or Region IX leg of "Iba na ang Panahon: Science for Safer Communities" (INAP: S4SC) last April 7-8, 2014 at Garden Orchid Hotel in Zamboanga City.

Prior to the press conference, Asec. Liboro spoke before the participants at the plenary session and mentioned the campaign's four-point agenda for community preparedness. This consists of: 1) increasing local risk knowledge, 2) knowing how to monitor risk hazards, 3) testing warning protocols in the community, and 4) planning for the response. "Anybody who can head these four steps is a disaster leader," Liboro later stated.

Due to climate change, Mindanao is now more frequently hit by typhoons. Zamboanga itself experienced continuous rain for five days in October 2013.



DREAM plane to fly in ARMM to chart hazard map

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

The DOST will fly a plane over the Autonomous Region of Muslim Mindanao (ARMM) in August to survey the region for hazard preparedness. The activity is part of DOST's project with the University of the Philippines called DREAM or Disaster Risk and Exposure Assessment for Mitigation, a component of the Project NOAH or Nationwide Operational Assessment of Hazards.

(Photos by Gerry Palad & Henry de Leon, S&T Media Service, *DOST-STII)*

"The plane will gather information on the region using a technology called LiDAR or Light Detection and Ranging to produce high-resolution, detailed, and up-to-date elevation maps and data sets," said DOST Asst. Secretary Raymund Liboro during the ARMM leg of "Iba na ang Panahon: Science for Safer Communities" held in Zamboanga City.

LiDAR is the state-of-the-art technology in getting topographic information on a certain area.

"The plane gets information on the area by 'throwing' laser over the areas it covers," Asec. Liboro explained.

Conventional surveying such as that done by geodetic engineers using surveying and mapping equipment will take six years while a newer technology called photogrammetry that uses planes to take pictures will take 1.5 years. LiDAR can finish the same job in 6.7 seconds at 150 khz, according to Czar Jakiri Sarmiento of the DREAM-LiDAR.

The information to be gathered by the plane's LiDAR equipment will be used to develop hazard maps showing the vulnerability of communities to certain natural hazards. The maps will be based on flood models and, used with the Integrated Flood Early Warning System, will be able to give people and communities at least six hours notice to prepare for impending floods and other disasters.

The DREAM-LiDAR mapping plane to fly in August will start with Basilan, then Sulu and Tawi-tawi.

"Processing of information is usually done in three months," Liboro said, "so we can confidently say that we will be able to produce ARMM's hazard map by next year."

"Preparedness is more important than rescue as we save more lives if we are ready when disaster comes. LGUs should stress on this," said DOST-ARMM Secretary Myra Alih.

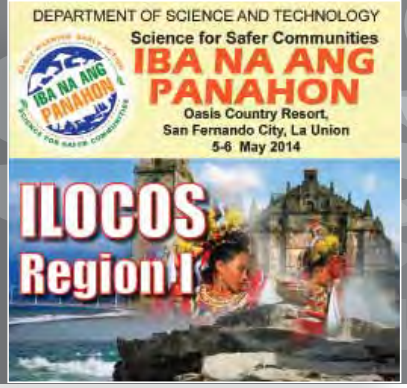
Meanwhile, DILG-ARMM Asst. Secretary Sharifa Pearlsia Alih said that the task of building a safe and disaster resilient Philippines is "still a work in progress" as she stressed the importance of using S&T-based tools in preparing for disasters.

To date, DOST has installed 46 sensors all over ARMM to help the region monitor rainfall, water level, and stream level to prepare for disasters such as flooding, earthquake, tsunami, and others.

S4SC in CARAGA Region

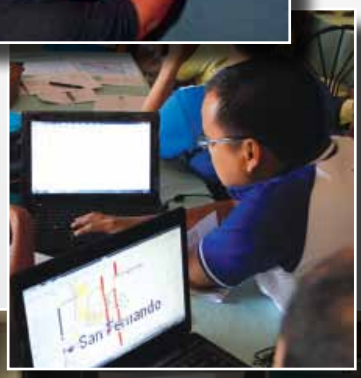
In 1879, a 6.9M quake hit Surigao. The port sank by one foot, some houses tilted while several collapsed, landslides occurred, and large fissures formed. "With the science-based tools available now, introduced to participants of the roadshow's CARAGA Region leg in Surigao City from April 29-30, locals will be more ready to face and deal with disasters of the same magnitude.

(Photos by Gerry Palad & Henry de Leon, S&T Media Service, *DOST-STII)*



More collaboration between DOST and other gov't agencies pushed

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



(Photos by Gerry Palad & Henry de Leon, S&T Media Service, *DOST-STII)*

"Iba na ang Panahon:Science for Safer Communities" (INAP:S4SC) reached Region 1 or the Ilocos Region last May 5, drawing more than 200 participants from the provinces of Ilocos Norte, Ilocos Sur, Pangasinan and La Union.

One of the topics that drew interest among the media during the press conference were DOST's Project NOAH and UP DREAM. Dr. Mahar Lagmay encouraged the DOST to work in partnership with other government agencies as he related about an invitation by the Department of Public Works and Highways (DPWH) last January 2014.

"Sometime in January this year, we were invited by the DPWH upon the request of Secretary Rogelio Singson to orient their regional directors and officers about NOAH and the DREAM project," Dr. Lagmay shared. "Now, we are closely working with them and provide them with hazard maps and other vital information so they can identify where to construct roads, bridges, dams and other infrastructures."

Previously, Dr. Lagmay walked the audience through the many features of the NOAH website where weather information, as well as downloadable mobile apps, are accessible for free 24/7.

"The NOAH program has many applications aside from providing weather information in real time produced from over 1,000 weather equipment installed all over the Philippines like rain gauges, water level sensors and weather stations," Dr. Lagmay stressed.

Cordi folks' disaster preparations get underway

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

"We came here expecting to learn about reduction and mitigation related to hazards and calamities and disasters," said Mayor Corinthia Crisologo of Tineg, Abra. And Crisologo, along with other local executives and disaster risk reduction officers, were satisfied.

Crisologo was one of the main participants in "Iba na ang Panahon: Science for Safer Communities" held on May 8-9, 2014 at the Albergo Hotel in Baguio City for the provinces of the Cordillera Administrative Region.

The campaign gave Crisologo and other CAR local chief executives and key disaster officers the opportunity to learn about hazard maps and identify disasters that could greatly affect their respective communities.

"Of course it is very informative although I do have knowledge on that, but it gave me additional info," added Crisologo. "It augmented again my knowledge (on) how to mitigate and how to be prepared in order for the constituents of the municipality of Tineg to be well informed and resilient."

The disaster information campaign included technical sessions and workshops which aimed to educate local government executives like governors and mayors as well as disaster risk reduction management officers from the provincial to the city and municipality levels on the different hazards in their communities.

During the workshop, some 36 participants from Abra province discussed among themselves and identified their major geological hazards like earthquake induced landslide, ground shaking, ground rupture and liquefaction.

Asked about what the municipality of Tineg is presently doing for disaster preparedness, Mayor Crisologo said, "We are already aware of Project NOAH, about the ARGs and we have to establish or construct them, maybe two weeks from now. Every municipality is required to have at least one… and this is the expertise of DOST and they just have to advise us and require us."

(Photos by Gerry Palad & Henry de Leon, S&T Media Service, *DOST-STII)*

S4SC in Cagayan Valley

A region more vulnerable to typhoons than Metro Manila, Cagayan Valley's best practices in disaster preparedness have served the locals well. Yet, participants of "Iba na ang Panahon's" Cagayan Valley run held in Tuguegarao City from May 12-13, were as eager to learn about science-based tools for early disaster warning as participants in the other regions.

(Photos by Gerry Palad & Henry de Leon, S&T Media Service, *DOST-STII)*

LiDAR technology sets sights on Davao Oriental

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

Davao Oriental province in Region XI is one of the next priority areas for 3D flood mapping via DOST's and UP's DREAM-LiDAR program which seeks to generate detailed flood hazard maps and inundation models for early weather information.

Mapping will start in August 2014 and may be completed by September, according to Dr. Enrico C. Paringit, program leader of DREAM which stands for Disaster Risk Exposure Assessment for Mitigation.

(Photos by Gerry Palad & Henry de Leon, S&T Media Service, *DOST-STII)*

Paringit shared this development during the Region XI or Davao Region leg of "Iba na ang Panahon (INAP): Science for Safer Communities" information campaign held at the Grand Regal Hotel in Davao City.

"We realized that these areas really need a lot of attention in terms of trying to update the current set of hazard information that we have," revealed Paringit. "Because we thought it's no longer about landslides. It's not just a matter of saying how resilient your house is against strong winds; it also matters where the house or the structure is located."

He related that when Davao Oriental was hit by typhoon Pablo in 2012, the major concerns were the strong winds and landslides. However, when typhoon Agaton slammed the province in January 2014, flooding became the main problem. Boston, Baganga, and Cateel municipalities experienced massive flooding, leaving some residents homeless. In fact, houses that survived Pablo did not escape the wrath of Agaton this time.

"Ironically, it led to two things. One, those that were previously identified to be safe areas or resettlements, were hit by the flooding. Second, infrastructure which were built to rehabilitate these areas after Pablo, such as the bridges, were also damaged," Paringit said.

In addition, the changing topography of Davao Oriental which will eventually affect other communities, needs finer-scale topographic mapping using LiDAR technology. This change in topography happened in the aftermath of Pablo as landslide materials coursed through the river systems as additional debris, thus causing the water to find other routes.

Paringit also added that finer-scale mapping will produce hazard information that will be useful for setting parameters of building design that can better withstand fierce calamities like Yolanda and Agaton.

"If you're data limited, you're also process limited. But if you're data rich, you're also process rich," Paringit stressed.

The Region XI leg gathered regional provinces as well as two provinces from the Autonomous Region of Muslim Mindanao.

Bicol's disaster preparedness highlighted in Iba na ang Panahon

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

"There is no substitute for preparedness."

This was the message of Mayor John G. Bongat of Naga City as he welcomed the participants of "Iba na ang Panahon: Science for Safer Communities" (INAP:S4SC) Bicol leg held at the Avenue Plaza Hotel in Naga City last May 19-20.

(Photos by Gerry Palad & Henry de Leon, S&T Media Service, *DOST-STII)*

"Let us make use of our talents, our heads, our hearts, and let us make use of science and technology to better prepare our communities for resilience," he added.

The Bicol region is exposed to virtually every natural hazard imaginable, being the third most visited by typhoons in the country. It is also home to active volcanoes and is dotted by fault lines.

In November 2006, Typhoon Reming caused a massive mudslide from Mayon Volcano. On July 2, 1954, a 6.7 M earthquake hit Sorsogon, destroying 40 houses, an old church and causing landslides and liquefaction. A 6.2 M earthquake also struck Masbate in February 15, 2003 which caused damage to some infrastructure. And then, in 1960, the Great Chilean Earthquake with a magnitude of 9.5, resulted to a tsunami that hit Bicol and other parts of the country.

Meanwhile, in the last 400 years, the world famous Mayon Volcano has erupted 49 times while Bulusan had 17 eruptions.

Yet, in recent years, Bicol Region has been able to show to the rest of the country that it is possible to build resilience in the face of disasters.

In his message, Dir. Bernardo Rafaelito R. Alejandro IV of the Office of Civil Defense-Region V, pointed out that the disaster response teams from their region are the first to respond to disaster situations in the country. He added that Bicol is the prime mover in the institutionalization of the Disaster Risk Reduction and Management (DRRM) offices in the local levels, and was the first to establish a DRR-Climate Change Adaptation training institute in the country.

Meanwhile, in his speech, DOST Regional Director Tomas B. Briñas reminded the participants that, "We should not be paralyzed by fear about disasters. We are fortunate, that there are evidence-based, scientifically proven tools, to guide us on how we are to address climate change and disaster in our areas."

INAP aims to bring information on disaster mitigation and management across the country's 17 regions to help LGUs understand the possible impact of hazards in their respective communities via technology solutions.

Eastern Visayas gears up for another Yolanda

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

Local officials, disaster risk reduction and city planning officers, as well as local government unit (LGU) consultants in Eastern Visayas or Region VIII are now better prepared to deal with earthquakes and typhoons as strong as Yolanda after taking part in DOST's "Iba na ang Panahon: Science for Safer Communities" (INAP:S4SC) held at the Sabin Resort Hotel in Ormoc City, Leyte.

"The number one feature I've learned is how to use Project NOAH," said Dr. Catalina Petilos, an LGU consultant from the municipality of Dulag in Leyte who attended the two-day event.

(Photos by Gerry Palad & Henry de Leon, S&T Media Service, *DOST-STII)*

Leyte province includes the cities of Tacloban and Ormoc, two of the most affected areas in the wake of super typhoon Yolanda which slammed several parts of Visayas in November 2013. Ormoc was also the site of heavy rainfall and severe landslide in 1991 which claimed the lives of many.

"Through NOAH, we can have a glimpse of the typhoon's path, when it will make landfall, the level of flooding, and where the floods will occur, so that we can inform our constituents to move to higher ground," said Dr. Petilos whose nephew was among the 22 who perished in Dulag because of Yolanda.

According to her, the casualties were due to coconut trees that fell, hitting some individuals and affecting coconut farmers. "There is already an action plan for the agricultural sector by the Municipal Agriculture Office (MAO)," shared Dr. Petilos. "I would let them revisit their plan and I will input the action plans [we formulated in the workshop], not just in MAO but in all sectors of our locality."

Region VIII updates

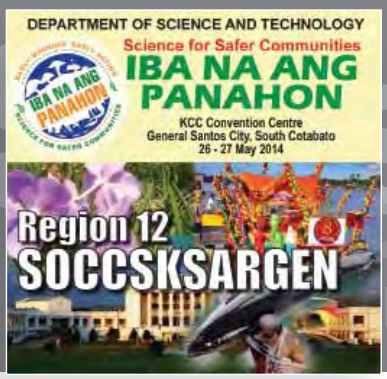
During the press conference, members of the media were updated on developments in the region regarding science-based tools and technologies.

Foremost of these is the completion of hazard maps for Tacloban City.

Another development involves the DREAM-LiDAR program, a component of Project NOAH, which is now completing its survey of Eastern Visayas to add to its 100,000 square kilometers of coverage for 3D flood models.

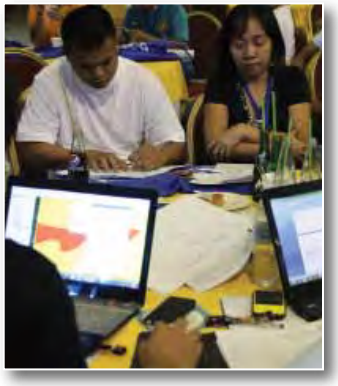
Meanwhile, PHIVOLCS is putting up a sea level detection system in Eastern Samar to provide Leyte with advanced information on the height of the sea level. "This is very important for tsunami warning. It can also be used to monitor the height of a storm surge," explained PHIVOLCS Director Dr. Renato U. Solidum. "We're also putting up earthquake intensity monitors. The latest we've installed are in Ormoc City, in their City Hall. They can actually get the intensity of the earthquake. The intensity will be sent directly to the web server of PHIVOLCS so that the responders, Office of Civil Defense, media, and others will find out which communities are affected by greater intensity," Solidum added.

Another development revealed during the presscon involves pictures of storm surge occurrence actually taken in the Philippines for inclusion in PAGASA's video clips about the natural phenomenon. Previously, PAGASA relied on pictures taken in the United States for its video clips.



Media practitioners urged to be instruments in sharing weather info

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



(Photos by Gerry Palad & Henry de Leon, S&T Media Service, *DOST-STII)*

DOST officials urged national and local media practitioners to be instruments in disseminating weather information to the general public during a press conference held in connection with the SOCCSKSARGEN (Region XII) leg of "Iba na ang Panahon: Science for Safer Communities" (INAP:S4SC) campaign in General Santos City last May 26.

During the presscon, DOST Assistant Secretary Raymund E. Liboro stressed that due to climate change, DOST is bringing to the communities through local government units, science-based tools and technologies like Project NOAH and DREAM with its websites containing weather information and flood hazard maps, respectively.

Likewise, Asec. Liboro said that for these knowledge products to be useful, the media plays a vital role as messengers to inform the public of their availability.

"You in media can help a lot in this campaign by DOST, DILG, and OCD so that we can bring solutions to the pressing problem of calamity preparedness," he told the audience at the presscon.

He said that the "Iba na ang Panahon" campaign is an initiative that aims to let local chief executives be more aware of the hazards in their local areas of responsibility so they can appreciate the early warnings given to them by PAGASA and PHIVOLCS and act swiftly to mitigate disasters. "Disaster management is everybody's business, not only of DOST or DILG. And media is one big ingredient," he stressed. "For disaster preparedness efforts to be successful, there should be an inter-relationship."

The same appeal was shared by PHIVOLCS Director Renato U. Solidum Jr. And PAGASA Administrator Vicente B. Malano as they enjoined the media writers and broadcasters present to use the medium to make people aware of the hazards and their possible effects. "Importante ang partnership ng media at mga ahensiya ng pamahalaan dahil dapat naiintindihan ng lahat kung ano ang mangyayari kung may kalamidad (The partnership between media and government agencies is very important because everyone should know what is going to happen if a calamity strikes)," said Dr. Malano.

Iba na ang Panahon does "whole of society" approach in NCR leg

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

The National Capital Region leg of "Iba na ang Panahon: Science for Safer Communities" (INAP: S4SC) took a whole different approach as compared to the past 16 legs.

While a significant number of attendees were disaster risk reduction managers and planning officers in Metro Manila and nearby areas, the activity was opened to non-government organizations, industry associations, foundations, private institutions, and other government agencies as well, in recognition of "whole of society's" role in dealing with disasters.

Mariels Almeda Winhoffer, president and country general manager of IBM Philippines, formally turns over to DOST Secretary Mario G. Montejo IBM's Intelligent Operations Center for emergency management during the NCR leg of "Iba na ang Panahon: Science for Safer Communities" info campaign.

(Photos by Gerry Palad & Henry de Leon, S&T Media Service, *DOST-STII)*

The venue at the Philippine International Convention Center packed over 800 participants, speakers, organizers, exhibitors, and media people for the final leg of the three-month long campaign held last May 29-30.

Supporting the event were Executive Secretary Paquito Ochoa Jr. and Metro Manila Development Authority Chairman Hon. Francis Tolentino who believes that a more science-oriented approach in disaster risk reduction management (DRRM) should be paired with common sense and professionalism.

"Our mercy towards our disaster-stricken *kababayans* should be transformed into merciless efficiency in achieving our DRRM objectives," he added.

Another highlight was the formal turnover of the Intelligent Operations Center (IOC) for Emergency Management from IBM to DOST.

"IBM's grant comes with two years of support, including an IBM-led transition team to ensure that we have the skills and expertise needed to fully maximize the power of this new technology to make Filipinos safer and more resilient to hazards such as Haiyan", said DOST Secretary Mario G. Montejo.

The new IOC will help the Philippine government better manage ongoing and future disaster response and recovery efforts. It comes with an Integrated Communications Center to facilitate better and more coordinated disaster management efforts among the DOST and various government agencies. In particular, the IOC will provide emergency managers with critical information such as advance warning for extreme weather events, feedback from first responders on the number of casualties and affected families, and conditions of buildings and infrastructure, among others.

Meanwhile, the Department of the Interior and Local Government (DILG) - DOST's partner since Day One of "Iba na ang Panahon," proved to be dependable until the very end.

In his message, DILG Undersecretary Austere Panadero, represented by DILG-NCR Director Renato Brion, reminded the participants that we cannot afford to be caught by surprise once again. "Let us prepare for the worst," he said.

"Imagine all the people, living life in peace...," Philippine Institute of Volcanology and Seismology (PHIVOLCS) Director Dr. Renato U. Solidum crooned in front of his audience. He sang Lennon's lyrics again and again, in almost every region of the archipelago as he found himself on the fast lane for three months, like a famous rock star. In this article, **Espie Angelica A. de Leon** reveals what the singing is all about.

Solidum sings the hazards

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

IMAGINE THERE'S A DISASTER. Dr. Renato U. Solidum, director of the Department of Science and Technology's Philippine Institute of Volcanology and Seismology encourages participants of DOST's "Iba na ang Panahon: Science for Safer Communities" information and education campaign in Region IV-A to use the power of imagination when formulating their action plans for future disasters. *(Photos by Gerardo Palad and Henry de Leon, S&T Media Service, DOST-STII)*

IT WASN'T a concert roadshow. Instead, it was a different kind of roadshow. And his audience was not composed exclusively of John Lennon fans or concert lovers out to watch him perform in order to relax and savor the timeless beauty of music.

Solidum's audience was mainly composed of mayors, governors, disaster risk reduction (DRR) managers and city planning workers. They were not necessarily Lennon fans or music aficionados. And they didn't watch him sing to savor the beauty of music; they heard him sing to savor the benefits of community disaster preparedness.

But yes, it was a roadshow – a series of Information and Education Campaigns (IEC) which toured all 17 regions of the Philippines in the summer of 2014.

But wait, what was the singing all about?

To prepare for a disaster, imagine it

It's all about what Solidum has been preaching to all and sundry: Disaster Imagination. The term has become a buzzword during and beyond the three-month roadshow – which should be the case.

According to the PHIVOLCS Director, disaster imagination is the silver bullet for battling fierce disasters which seem commonplace nowadays even outside the Philippines. It allows local chief executives and DRR staff to make quick decisions and act swiftly. "Before any calamity strikes, local government officials need to imagine disasters in their communities, he reminded his audience during the regional IEC campaigns dubbed "Iba na ang Panahon:Science for Safer Communities."

"Possible future hazards and their effects in localities and the whole region must be imagined to craft and implement appropriate solutions. Think of a scenario then imagine what areas will be affected, who will be affected, how many people, what infrastructures can be affected," he elaborated.

The roadshow aimed to arm local government units with knowledge and science-based technologies for community preparedness against disasters especially in the face of climate change. Among these technologies are 3D hazard maps, flood inundation models, Project NOAH website, mobile applications for disaster warning and information, Google Earth, and PHIVOLCS' very own REDAS or the Rapid Earthquake Damage Assessment System. It is an earthquake simulation software – the only semi-geographic information system software which can simulate earthquake hazards.

"It can be a database to put in the location of your houses and statistics of the houses, it can estimate the number of buildings and casualties per municipality. The concept is risk assessment. With these data, you'll know what to do, what steps to take," Solidum explained the concept behind REDAS. Hazards and risk assessment involves knowing what particular areas will be affected and who may be affected if a natural calamity strikes. This way, one gets a fairly good idea on the possible scale of damage that a calamity may bring to a certain community.

Explaining further, Solidum stated that disaster imagination starts with identifying the hazards which may possibly hit one's locality. This is followed by making an assessment of these hazards by identifying their magnitude and the possible affected areas. The next step involves an assessment of possible casualties and losses and the entire damage scenario.

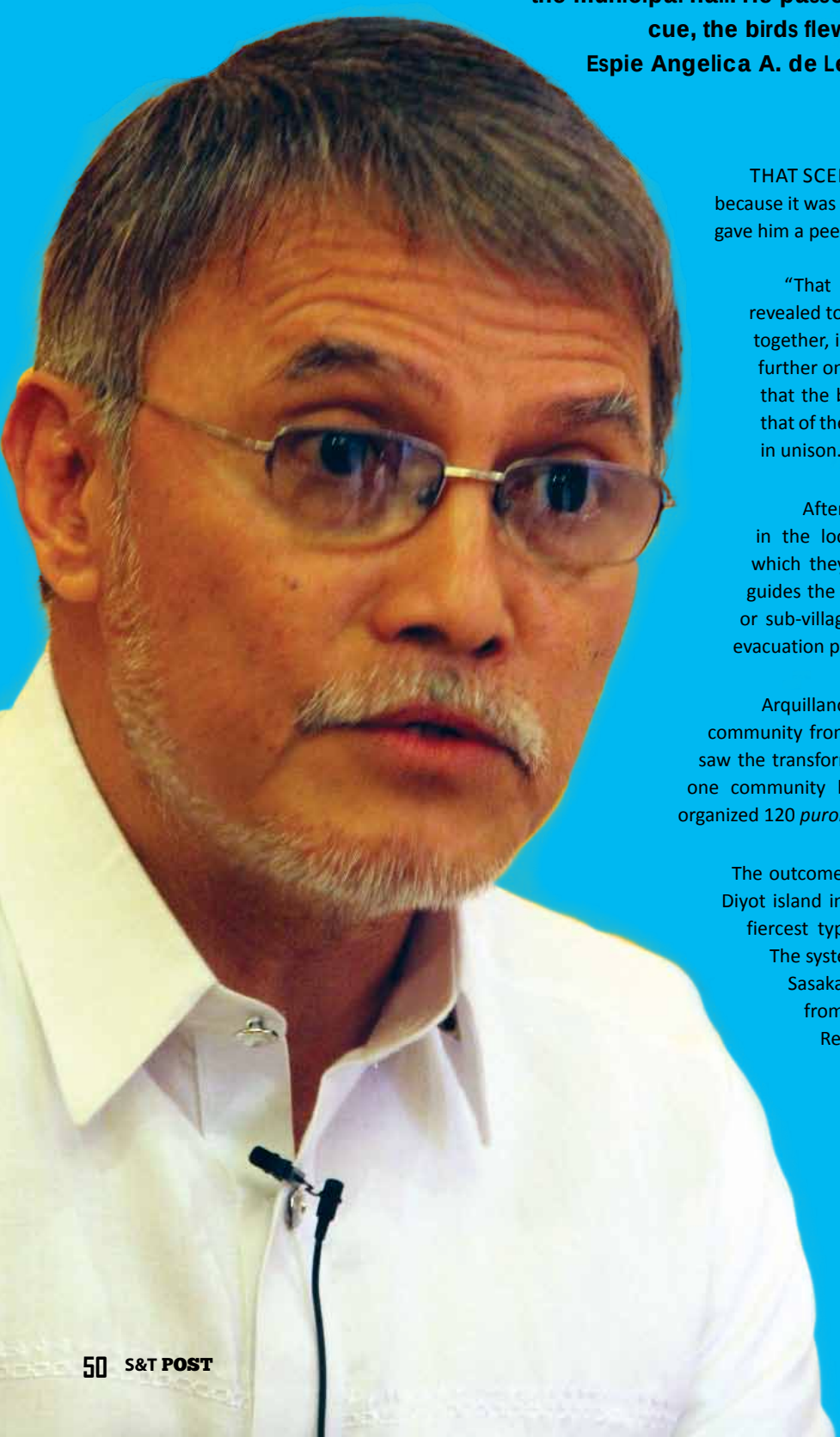
"Appropriate preparedness, mitigation measures and response measures must be according to the scenarios that can happen, that we can think of, even before this would happen. So disaster imagination is important," he emphasized. "We are giving you scenarios so you can prepare as a region so that it isn't only the affected residents who will prepare, but also those who can help them. And you have the most important role to be not injured, to be alive, during a major event," he reminded the IEC participants.

And then the PHIVOLCS Director proceeded to sing Lennon's song, to remind everyone of the benefits of disaster preparedness rooted in imagination.

24/7 community preparedness, 0 casualty: The Tulang Diyot experience

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

One day in 2004, Alfredo Arquillano Jr., then mayor of San Francisco town in the Camotes Islands between Cebu and Leyte, was walking in front of the municipal hall. He passed a tree and some birds. Suddenly, as if on cue, the birds flew together, thus causing a branch to break. Espie Angelica A. de Leon tells us the significance of this moment.



THAT SCENE proved to be symbolic and prophetic; symbolic because it was a manifestation of unity, and prophetic because it gave him a peek into the future of his beloved town.

"That incident gave me an inspiration," Arquillano revealed to S&T Post. "I realized that if people do something together, in unity, they can produce results." He elaborated further on his observation of the tree and the birds, stating that the branch broke because there was a disturbance – that of the pack of birds which suddenly took off the ground in unison.

After that incident, Arquillano, his staff and colleagues in the local government started developing the system which they call the *purok* system. The indigenous system guides the community to work together down to the *purok* or sub-village level to make easy communication and rapid evacuation possible when disaster occurs.

Arquillano's team started small – picking one willing community from each *barangay*. Eventually, other communities saw the transformation and so they joined in as well. Eventually, one community became one district or *purok*, until they had organized 120 *purok* under the system.

The outcome is simply remarkable: Zero death toll for Tulang Diyot island in San Francisco in the aftermath of Yolanda, the fiercest typhoon ever to make landfall in the Philippines. The system also won for San Francisco the United Nations Sasakawa Award for Disaster Risk Reduction in 2011 from the United Nations Office for Disaster Risk Reduction.

Other municipalities in Cebu have adopted the *purok* system as well. "They already have a template. They don't have to re-invent. They can just enhance it later on," Arquillano explained.

(Photo by Henry A. de Leon, S&T Media Servoce, *STII-DOST*)

The *purok* system at work in San Francisco, Camotes Island.

Vice Mayor Arquillano's presentation was one of the most awaited during the nationwide roadshow.

Things have not been easy though. They faced many challenges but as Arquillano claimed, "In every problem, there is a solution. Find a solution, instead of surrendering to the problem." Hence, they started seeing the results after five years.

"But they [the people] were empowered," Arquillano remarked. "The values of volunteerism and nationalism were inculcated in their minds. So then we found an avenue through which to disseminate essential information and educate our people with the system."

Arquillano, now vice-mayor of San Francisco, was among the roster of speakers during last summer's "Iba na ang Panahon:Science for Safer Communities" nationwide disaster information campaign. In fact, his presentation was one of the most awaited in every regional run.

In his presentation, Arquillano said that among others, the *purok* system undertakes the following: Put in place organization and coordination to understand and reduce disaster risk based on participation of citizen groups and civil society, assign a budget for disaster risk reduction (DRR), prepare risk assessment and use this as basis for decisions in connection with urban development, invest in infrastructure critical to DRR and make necessary adjustments as required by climate change, DRR education and training in communities and schools, protect ecosystems and natural buffers to mitigate floods, storm surges and other hazards, and regular public preparedness drills. In addition, they put in place a solid waste management system to help reduce the onset of flooding caused by clogged waterways.

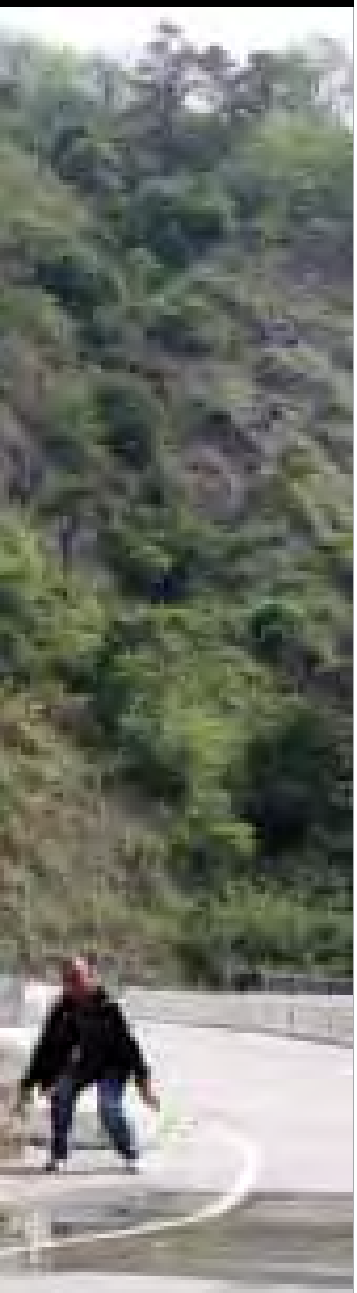
Narrating the events on the day before Yolanda made landfall, the soft-spoken and charismatic vice-mayor of San Francisco said they immediately held a meeting after PAGASA issued the typhoon warning. They decided to evacuate all 1,000 residents and immediately, everyone grabbed their belongings and proceeded to higher ground -- the San Francisco town proper.

On November 8, 2013, all houses in Tulang Diyot Island were leveled to the ground. But its people survived the fury of Yolanda, thanks to their awareness of the island's own disaster vulnerability and sense of community preparedness. Thanks to the *purok* system inspired by the pack of birds that flew off together in front of the municipal hall. And thanks to their former mayor Alfredo Arquillano Jr. who had the vision to craft the *purok* system.

S4SC: blood, sweat, tears, and cheers

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

Long hours of travel, mind-blowing coordination, backbreaking hauling of equipment, pounding egos and tempers – S4SC was simply a feat not even the most seasoned traveler would dare try. Yet, amid the tears and the fears, were the cheers as well, as S4SC progressed into one heck of a nightmarish, but fulfilling experience. **Joy M. Lazcano** gives us a glimpse of this rollercoaster ride as he compiles these quotes and anecdotes:



(Photos by Henry de Leon, Gerry de Jesus, Espie Angelica de Leon, S&T Media Service, *DOST-STII*)

I thought I was lucky to be in an airconditioned cabin going to Manila from Romblon. But I was wrong! I was not able to sleep throughout the trip. I think, 80% of the passengers in the cabin of around 50 beds were snoring. You could imagine the orchestra of different sounds of snores. - ***Benedict P. Cagaanan, STII***

Travelling from leg to leg, while physically draining and literally a pain in the butt from having to wait long hours at the airport, seaport or just sitting in the van for the 9 to 13-hour road trips, gave us an opportunity to really get to know our officemates and our new friends outside the Institute. - ***Louise Ian De los Reyes, STII***

I started my golden year on the road to far north of Luzon - almost 9 hours of travel spent eating, sleeping, reminiscing, contemplating, planning, praying, and yes, taking pictures of all interesting sights. - ***Henry de Leon, STII***

The upside is you get to try an array of food from different regions and a sort of bonding with your fellow STII workmates. The downside is, you have to go through a grueling two regions per week of travel and carry six huge boxes of office supplies and audio-video equipment including hundreds of publications and a bag filled with clothes. - ***Joy M. Lazcano, STII***

May time factor tayo dyan - to be able to finish the campaign in 3 months time. Kaya magmula doon sa ticketing problems, sa setup, hanggang doon sa clean-up activities, eh talaga namang nagsakripisyo [tayo] lalo na ang mga may pamilya. - ***Gerardo de Jesus, STII***

All the stress, (almost) sleepless nights, fatigue, and sickness up to the point of being rushed to the hospital, were all worth it because I got to meet and talk to local chief executives and nameless heroes (disaster managers) from all over the country. - ***Suzette Dalumpines, Project NOAH***

The S4SC event opened my eyes not just on the diverse and rich culture that we Filipinos have but also on the eagerness to learn and the seriousness to handle disastrous situations. The Bayanihan spirit lives on, which I applied to my wedding preparations. - ***Rajyl Muleta, STII***

Masaya naman at medyo mahirap din. Yung pinakamatindi yung travel from region 1, 2, CAR and Davao. Pero ok lang. Masaya kasi sama sama pa rin ang group ng S4SC. - ***Gerry Palad, STII***

Lahat ng klase ng ugali meron dun. Masarap kasi sasakay ka ng eroplano, pupunta ka sa mga probinsiya na pinangarap mong mapuntahan. Tapos pagdating doon, hanggang dun ka lang pala sa hotel. Mahirap dahil malayo ka sa pamilya mo. Pero nang mawala na at natapos na, na mi-miss mo rin. - ***Ferdinand Cartas, STII***

It was quite hard to be a documenter of the proceedings and a facilitator at the same time. You were working double time, thereby missing out on the snacks. But it was quite rewarding because you learn to answer questions which were sometimes amusing - ***Rodolfo de Guzman, Project NOAH***

The most challenging part was the second day. We at the Secretariat were a bit rattled to print the Certificates of Appearances and Certificates of Participation when people rushed to us and asked for these things - ***Mario Buarao Jr., STII***

Three of us gave up our PAL seats to accommodate other passengers. Hence, we were to take the next flight from Naga to Manila for our connecting flight to Tacloban. That flight was late. So when we finally landed at NAIA, we rushed and ran like crazy at the airport to catch the next plane which was already letting passengers in including our officemates. We made it inside….after a lot of panting, sweating, and panicking. – ***Espie Angelica de Leon, STII***

To say that "Iba na ang Panahon" is gruelling is an understatement. I had to wear multiple hats--as documentor, writer, and facilitator at times. For me, the best part was meeting people who appreciate what you do, even if you feel that your contribution is just minimal. Also, it took an "INAP" for me to get to know more about the very people I work with everyday. - ***Ma. Luisa Lumioan, STII***

I covered seven of the 17 legs of INAP. I was on my 6th-7th month of pregnancy. It was not easy to travel in this condition but I am grateful to be part of this project. Some STII folks nicknamed my baby "INAP" for "participating" in the activity while still in the womb. I hope when he grows up, he will also be a part of life-saving and highly relevant initiatives like the S4SC. – ***Framelia Anonas, STII***

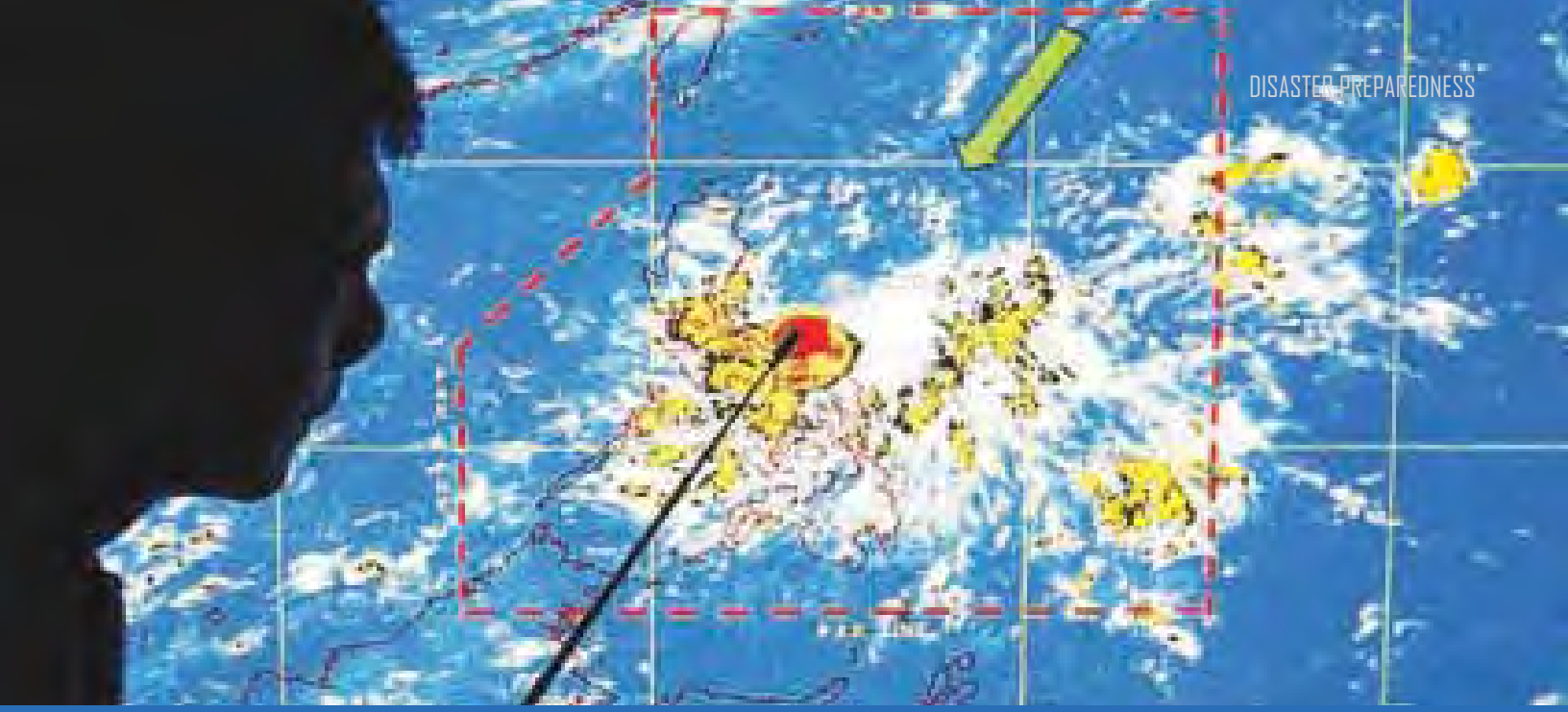
The S4SC Cagayan Valley leg was one of the most enjoyable events considering that the DOST host region was very accommodating and supportive – ***Susan Abada, STII***

Our outmost patience was tested in different situations and instances but what is more important is the spirit of community service which was imparted to us as project staffs - ***Cecil Ramos, STII***

It promoted camaraderie among members of the DOST agencies. We got to talk to our Director more often. - ***Mabee Cahulogan, PHIVOLCS***

Nakakapagod, pero ang dami kong nakilalang ka-ahensya. - ***Mabel Abigania, PHIVOLCS***

S4SC for me is my WOW PHILIPPINES!!! - ***Raymond Maximo, PHIVOLCS***



DOST vows to improve delivery of weather information

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

THE DEPARTMENT of Science and Technology (DOST) vows to improve its delivery of weather information as a new study shows that public knowledge is insufficient to fully understand concepts on weather, climate, and disaster issues.

The study, conducted by the Science and Technology Information Institute (DOST-STII) and Project NOAH Strategic Communications Interventions Project Team with the help of DOST-National Capital Region and titled "Understanding and Appreciation of Weather Information" and was revealed in the form of a poster presentation during the 81st National Research Council of the Philippines (DOST-NRCP) General Membership Assembly and International Scientific Conference dubbed as Future Earth, Future Philippines held at the Manila Hotel March 26-27, is aimed at measuring and understanding the public perceptions and familiarization on weather information and delivery.

Based on the DOST-STII study, majority of people rely on television as the primary source of weather information followed by radio broadcasts, newspaper, internet, mobile phones, and barangay officials. Participants in the said study which came from various inland and coastal communities in Metro Manila believe that weather information remains to be too scientific and too general which result to low rate of comprehension.

Also, the need to "laymanize" the delivery of weather information does not only mean translating vital information from English to the vernacular but also making the people understand terminologies and concepts so that people can understand the possible impacts to them and make informed decisions.

In response to the huge challenges in accurate and laymanized weather forecasting, DOST conducted a roadshow in various regions of the country dubbed "Iba na ang Panahon: Science for Safer Communities"- a two day workshop designed for the local chief executives (LCE) and provincial disaster risk reduction managers (PDRRM).

The project aims to come up with a localized disaster risk reduction communications protocols through various hazard scenario building exercises conducted by various hydro and geohazards experts from PHIVOLCS, PAGASA, and Project NOAH.

These communications protocols will help LCEs and PDRRMs streamline weather and emergency information down to the communities seamlessly. Through these efforts and with the help of new weather early warning tools such as high-resolution maps and weather modelling software, the country can expect more timely and accurate weather outlooks all throughout the year.

The DOST-NRCP General Membership Assembly and Scientific Conference convenes hundreds of homegrown Filipino researchers, scientists, innovators, and economists to discuss the future prospects of the country amid the threats of climate change.

Moreover, the event brought in two Nobel Laureates, Richard F. Heck and Yuan T. Lee.

Dr. Richard Heck was jointly awarded the Nobel Prize in Chemistry on October 6, 2010, with the Japanese chemists Ei-ichiNegishi and Akira Suzuki, for their work in palladium-catalyzed coupling reactions in organic synthesis used in pharmaceuticals and electronics industries.

Dr. Yuan T. Lee on the other hand was a 1986 Nobel Prize laureate who, together with John C. Polanyi and Dudley R. Herschbach, contributed to the dynamics of chemical elementary processes. Dr. Lee presented his paper titled "Future Earth, the Initiative for Global Sustainability," which tackles the current and future state of world climate, believed to hit 4°C at the end of the century.

Hazard maps for a safer country

By MARIA THERESSA A. RONATO
S&T Media Service, *DOST-STII*

PREVENTING DISASTERS is now greatly aided by scientific tools such as hazard maps. This kind of map shows areas that are affected or are vulnerable to hazards such as earthquakes, volcanoes, landslides, flooding and tsunamis. It helps in preventing serious damage and deaths.

In the joint project of the Department of Science and Technology (DOST) and Department of Environment and Natural Resources (DENR) called "Yolanda Rehabilitation Scientific Information Center" (YoRInfoCenter), these hazard maps are available for individuals and organizations that need such crucial data in rehabilitating Yolanda-stricken areas.

A one-stop-shop for scientific data, the YoRInfoCenter will provide all available data like high-resolution hazard maps, satellite imageries, and other tools that are necessary for the systematic and practical rehabilitation of the areas ravaged by typhoon Yolanda. The maps are produced by the DOST-UP DREAM Project and DENR's Mines and Geosciences Bureau.

According to Dr. Eric Paringit, project leader of DREAM, "Hazard maps are created to provide early warnings to the people in times of danger, installation of the requirements for housing, mapping out for the agriculture and other natural resources."

"The maps are used in locating the damaged areas, in knowing if an establishment still exists, and in creating the rehabilitation plans," Paringit added.

According to Dr. Elmer Billedo of the DENR-MGB, the maps are used in knowing the "impacted areas."

The hazard maps are available in the barangay scale to let the people know the hazard areas in their respective places.These maps were verified by the Japan Society of Civil Engineer, said Billedo.

Also available at the YoRInfoCenter are multiple hazard maps that put together in one map the different hazard-related information for a study area in order to convey a composite picture of the natural hazard of varying magnitude, frequency, and area of effect.

DENR-MGB has completed 102 hazard maps out of 171 municipalities affected by typhoon Yolanda. DREAM has likewise completed a number of maps developed through Light Detection and Ranging (LiDAR) technology.

The maps can be downloaded in the websites of DOST and DENR and will be distributed in respective areas.


RONATO

Predictive damage and business continuity for proactive disaster preparedness

By ANNA THERESA P. VALMERO
S&T Media Service, *DOST-STII*

THE DEPARTMENT of Science and Technology shared lessons on innovations in disaster risk reduction and management, including its new agenda for including "predictive damage" and "business continuity" as part of the country's pro-active disaster preparedness agenda.

DOST Secretary Mario G. Montejo first announced the two concepts during the opening plenary session of the Asia Europe

Meeting (ASEM) Manila Conference (2014) at the Diamond Hotel in Manila last June 5, 2014.

Predictive damage, noted Sec. Montejo, "is the capability of being able to simulate and model severe weather events and the amount or extent of damage that they would cause to the areas affected."

On the other hand, "business continuity is the capability to restore, within a prescribed period, vital services both public and private after a severe weather event. These vital services include power, communications, transport, food and drinking water, health, security, banking and commerce, among others."

New methods of dealing with disasters

The two concepts come in handy with the recent onslaught of typhoon Haiyan (Yolanda) which called for new ways of practicing disaster risk reduction and management and their prioritization in the country's development agenda.

"Advanced information on impending disasters derived through the application of science and cutting-edge technologies enables vigilant local governments and the public to take early action and in turn, save lives," Sec. Montejo added.

In the Philippines, the use of science-based weather information was made possible through DOST's modernization project. Part of this are the Nationwide Operational Assessment of Hazards (Project NOAH), which offers an online platform to monitor typhoons and floods based on real-time data feeds from 1,000 rain and water level sensors nationwide. Another component is the internationally renowned national 3D mapping project called Disaster Risk Assessment, Exposure and Mitigation-Light Ranging and Detection Technology (DREAM-LiDAR) which won the prestigious Geospatial World Excellence in Policy Implementation Award for 2014 awarded by the Geospatial World Forum last May in Geneva.

By using Project NOAH and the 3D map models of DREAM, Marikina City was able to enforce evacuation hours ahead of the 2012 and 2013 Habagat (Southwest Monsoon) Flood events, both of which registered Ondoy-like flood levels.

Predictive Damage and Business Continuity

Thus, to further push the envelope for better disaster preparedness, DOST is introducing the concepts of "predictive damage" and "business continuity."

In predictive damage, probability-based behavioural damage models for various types of infrastructure and natural assets of concern can be developed by evaluating and analyzing

historical data on damage caused by previous severe weather events. These models, used in conjunction with our improving weather forecast methodologies, would allow us to predict probable damage, thus allowing pro-active disaster preparedness and response.

"This approach is not only applicable for response or near-term planning but may also be used for a medium- and long- term disaster risk reduction program," explained Sec. Montejo.

Predictive damage will also serve as the starting point for analyzing the strength and vulnerabilities of critical assets and infrastructure against severe weather scenarios modeled using the maps generated by DOST's projects. This will allow planners to better understand areas for improvement, retrofitting, and can even go as far as provisioning of backup services for disaster preparedness and response.

"Meanwhile, under the concept of business continuity, vital services can be restored after 12, 24 or 48 hours or more depending on the priority of a service. We proposed that a committed "business continuity" timetable for vital services be made the goal for all disaster preparedness and response programs," he said.

VALMERO

DREAM COME TRUE:
DREAM-LiDAR wins geospatial excellence award

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

THE DEPARTMENT of Science and Technology's (DOST) 3D mapping project called Disaster Risk Assessment, Exposure and Mitigation-Light Ranging and Detection Technology (DREAM-LiDAR) won the prestigious Geospatial World Excellence in Policy Implementation Award for 2014.

DOST Secretary Mario G. Montejo and DREAM Program Leader Dr. Enrico Paringit received the award on May 8 in Geneva, Switzerland.

A component of the Nationwide Operational Assessment for Hazards (Project NOAH), the DREAM-LiDAR addresses and helps mitigate the effects of flooding disasters in the country. This is done by collecting precise geospatial data with LiDAR to produce detailed topographic information that will enable the creation of more accurate flood inundation maps. Led by Dr. Eric Paringit, DREAM-LiDAR is by far the biggest single project that a research unit in the entire University of the Philippines system has ever undertaken.

The project's main deliverable is an accurate national terrain elevation map to be used for creating flood plain inundation maps and for performing on-demand flood simulations. The digital terrain maps will cover all relevant river basins with one-meter horizontal resolution and 20-centimeter vertical accuracy.

The project has purchased three airborne LiDAR scanners and leased three small fixed-wing aircraft to survey 18 large river basins that total more than 100,000 square kilometers in area which is about one-third of the country. The project requires elaborate preparation and training of local staff to carry out various technically challenging tasks such as hardware installation, flight planning, LiDAR quality checking, data pre- and post-processing, and flood modeling, among others.

DREAM-LiDAR, considered as a unique role model for the region, offers the opportunity of acquiring equipment, training local staff, and educating the public, as well as adding excitement to many young Filipino researchers.

Creating technical expertise as it is implemented in an educational institution, DREAM-LiDAR is constantly training and self-educating the local staff. Upon completion of the project, it is expected to have created a pool of highly-skilled LiDAR and Flood Mapping experts. These experts can apply their technical knowledge and skills in government agencies and commercial enterprises and get further value from the collected elevation data or innovate for novel 3D applications.

Aside from producing both product and expertise needed to exploit data at a much lower overall cost while also creating new tax-paying high-tech jobs across the Philippines, DREAM-LiDAR also hopes to inspire other nations in charting their own national mapping programs.

The DREAM-LiDAR project is housed at the National Engineering Center of the University of the Philippines Diliman in Quezon City.

Meanwhile, the Geospatial World Magazine owned by Geospatial Media and Communications (formerly GIS Development) conferred the award to DREAM.


ANONAS


The winners of the Geospatial World Policy Award present their trophy. From left to right: Prof. Eric Paringit, associate professor at UP Diliman, DOST Sec. Mario Montejo, Mrs. Montejo, and Mrs. Cecilia Rebong, ambassador and permanent representative of the Philippines to the United Nations.(Photo from: LAStools Facebook)

(Photo by Henry de Leon, S&T Media Service, *DOST-STII)*

Marikina receives 20 MOSES tablets

By JOY M. LAZCANO & ANNA THERESA P. VALMERO
S&T Media Service, *DOST-STII*

TWENTY MOSES tablets, or the Monitoring and Operating System for Emergency Services – the first of its kind in the Asian region - were turned over to Marikina City last June 9, 2014 at the Marikina City Freedom Park to help enhance the disaster preparedness of its *barangays* and prevent casualties from floods in the event of strong typhoons.

The MOSES tablet is an 8-inch Internet-based, two-way communication tool between warning agencies and disaster responders. It was developed by the Department of Science and Technology (DOST) in partnership with the Department of the Interior and Local Government and the National Disaster Risk Reduction and Management Council.

According to Project NOAH (Nationwide Operational Assessment of Hazards) Director Alfredo "Mahar" Lagmay, two-way communication is essential in mitigating the impact of disasters.

The MOSES tablet can receive real-time weather and flood information from pre-installed mobile applications such as PAGASA or the Philippine Atmospheric, Geophysical, and Astronomical Services Administration; DOST's Project NOAH; and ARKO which provides detailed flood maps.

Using the tablet, a *barangay* disaster officer or captain can go around the community to take pictures of evacuation centers, schools, hospitals, lifeline services, and others. The images are then uploaded via 3G or WiFi on the Project NOAH website map and are automatically geo-tagged to provide disaster responders a more visual map of the area in relation to available facilities, or lack thereof, during disaster preparedness.

In the event of a typhoon, the tablet can also be used to monitor water level in the rivers as soon as a storm signal is raised in the community. Photos of flood levels can also be sent to national warning agencies and the Project NOAH team for data verification and search-and-rescue operations.

Furthermore, the tablet has television and radio functions with a battery that could last for three days.

The tablets will be given to each of the 16 *barangays* in Marikina. DOST is set to hand over additional units of the MOSES tablet to other cities and municipalities in the country as it was able to fabricate the first 50 units. It is targeting a total of 42,028 *barangays* to have their own MOSES tablets.

Marikina as its first recipient

With MOSES as the first two-way disaster communication platform in the region, Marikina becomes the first local government to have this groundbreaking technology.

In 2009, Marikina was badly hit by Typhoon Ketsana also known as Ondoy, where a month's rainfall poured in less than 24 hours of torrential rain, producing around 78 feet of floodwater. Typhoon Ondoy resulted in 464 deaths in Marikina alone in which 80 percent of the area is considered flood prone due to the Marikina River system.

In 2011, DOST launched Project NOAH and made Marikina City as its test site. A year after, during the August 2012 Southwest Monsoon or Habagat, Marikina River swelled in 68 feet of floodwater. However, this incident was subdued by the zero casualty situation posted by the city, considered as one of the breakthrough achievements of Project NOAH. The city achieved this by taking heed of Project NOAH's warnings and implementing early evacuation of the local communities.

As DOST gears up for the 2014 edition of the National Science and Technology Week (NSTW), focus, once again, turns to the eight outcomes which the Department had committed itself to achieving en route to becoming a Science Nation. In this article, **Dr. Aristotle P. Carandang** reveals what is in store for the public come NSTW 2014.

Science Nation

By ARISTOTLE P. CARANDANG, PhD

IN ONE of his speaking engagements, DOST Secretary Mario G. Montjo said "Technology is still what drives the world today. And its velocity just keeps on accelerating. Now, more than ever, a nation's command of science is what determines whether that country will be the source of invention and innovation, or just a user, technology dependent on others. Now, more than ever, science and technology determines who makes it to the next decade."

True enough, in this year's National Science and Technology Week (NSTW), the DOST management has embraced the theme "Philippines: A Science Nation Meeting Global Challenges" to underscore the efforts of Filipino experts as the country slowly works toward hurdling the challenges of development and globalization.

Secretary Montejo also shared, "At the DOST, as the steward of the nation's S&T agenda, we are guided by the fundamental policy that it is us Filipinos that must chart our own course and that it must ultimately benefit Mang Juan and Aling Maria--consistent with President Aquino's inclusive growth agenda."

Walking the talk

This is the DOST Secretary walking the talk with what is now known as the 8 DOST Outcomes. And bent on pursuing the integrative vision of inclusive growth, the DOST has identified key areas and clustered them into the following outcomes:

The 8 DOST Outcomes are presented at the 2014 NSTW in a manner by which audiences, whether aged 5 or 95, can easily relate to.

1. Science-based know-how and tools that enable the agriculture sector to raise productivity to world-class standards;
2. Innovative, cost-effective and appropriate technologies that enable MSMEs to develop and produce competitive products that meet world-class standards;
3. State-of-the-art facilities and capabilities that enable local industries to move up the value chain and attain global competitiveness;
4. PH a global leader in Information Technology - Business Process Management Services generating direct employment of 1.3M (520,000 in the countryside);
5. ICT-based transformation of governance broadening access to government services (i.e. health and education) for those in the countryside (PH in the top 50 global ranking of e-government by 2016);
6. Improved quality healthcare and quality of life thru science, technology and innovation;
7. Highly skilled and globally competitive S&T human resources in support of the national S&T programs (PSHS to be the leading science high school in ASEAN by 2015 and every town to have at least one DOST scholar by 2016); and
8. Science-based information on weather, climate change and geological hazards to ensure the country's survival and future in an era of extreme and rapidly changing climate.

Many Firsts and the Unorthodox

The 8 DOST Outcomes are presented at the 2014 NSTW in a manner by which audiences, whether aged 5 or 95, can easily relate to. In said event, each Outcome has a centerpiece of its own and almost all centerpieces are

For the first time, too, the event is staged at the entire SMX, meaning all halls will be used for the grand S&T event.

interactive and easy to understand. What makes the event truly a first is that all the latest products and services from the Department are given equal prominence together with the strengthened partnerships the DOST has forged throughout the years. Truly, both the internal vigor and integrative dynamism of the DOST family are shown as the core strength of the Department.

For the first time too, in the history of the NSTW, the celebrations start on a Thursday and end on a Monday – from 24 to 28 July 2014; the usual was from Monday to Friday without touching the weekends; which was truly unorthodox. When asked about the rationale of including the 'untouchable' weekends, the organizers said that although it is a big risk, they wanted to capture the weekend public since the annual event is held at the SMX Convention Center at the Mall of Asia.

And for the first time, too, the event is staged at the entire SMX, meaning all halls will be used for the grand S&T event. In 2012, the DOST used only one hall of the venue and in 2013, two halls. But the year 2014 witnesses all four halls being devoted to the biggest gathering in the Philippine science community.

For all of these, the DOST Secretary has been keen on the paradigm of developing the country's own capacity; which has been the guiding policy in all S&T initiatives, whether it is about developing cost-effective solutions to address the basic needs of Aling Maria and Mang Juan; or providing solutions to problems of our farmers like the current coconut scale insect infestation or Cocolisap, which is now affecting thousand of coconut farmers mostly in Southern Luzon.

He also stressed the need to improve productivity in the agriculture sector while providing appropriate technologies to our micro-, small-, and medium- scale enterprises

In said event, each Outcome has a centerpiece of its own and almost all centerpieces are interactive and easy to understand.

to make them ready for the ASEAN challenge of 2015. In addition, Sec. Montejo wants to identify gaps and weaknesses in the technology chains of our industries and address them to make them globally competitive. This will be further strengthened by providing facilities and know-how that encourage more product development activities that will in turn harness the creativity and innovativeness of the Filipinos.

The road toward achieving all these may be long and winding; but there surely is a road that leads the country to becoming a '**Science Nation**'.

outcome 1

AGRICULTURE

Demystifying cocolisap: Using science-based know-how to combat pest

By ARJAY C. ESCONDO
S&T Media Service, *DOST-STII*

COCONUT PLANTATIONS in Batangas Province have fallen prey to the wrath of coconut scale insect (CSI). Known locally as "cocolisap", the CSI is one of the most damaging pests of coconut and other palms. Equipped with specialized mouthparts for sucking, this pest feeds on sap directly from the tree's vascular system, causing yellowing or chlorosis, wilting, premature nutfall, and ultimately low yield.

The Department of Science and Technology (DOST), together with Philippine Coconut Authority, Department of Agriculture – Regional Crop Protection Center IV-A, and University of the Philippines Los Baños, sees the need to fast-track the mitigation and slow down the rate of infestation to allow the recovery of severely damaged palms. This objective forms part of the backbone for DOST's Outcome 1 – Agriculture.

New species found

Researchers initially identified the scale insect as Aspidiotus destructor, a species that is endemic to the country. However in 2014, DNA markers showed that a new species, Aspidiotus rigidus is present in a mixed population together with A. destructor.

DOST Sec. Mario G. Montejo emphasized that it was critical to know the identity of the pest first to have an effective control. "By zeroing in on science, its approach and using cutting-edge technologies, we can find solutions to these problems, and we are confident on these protocols developed by the Task Force", he added.

S&T in action

Addressing the urgency of the CSI concern, the Emergency Research and Development Response Program and Management of Coconut Scale Insect Task Force has pushed for the development of systematic and immediate R&D strategies to manage CSI infestation.

The program highlights the importance of sustainable science-based integrated pest management strategies to manage the spread and control the damage of the pest through various initiatives. These include the Development of Crop Care Strategies Against Coconut Scale Insect (Project 1); Ecological Studies on the Potential Biological Control Agents of CSI (Project 2); and Biological Control Strategies Against Coconut Scale Insect (Project 3).

Management Protocol & Efficacy Assessment

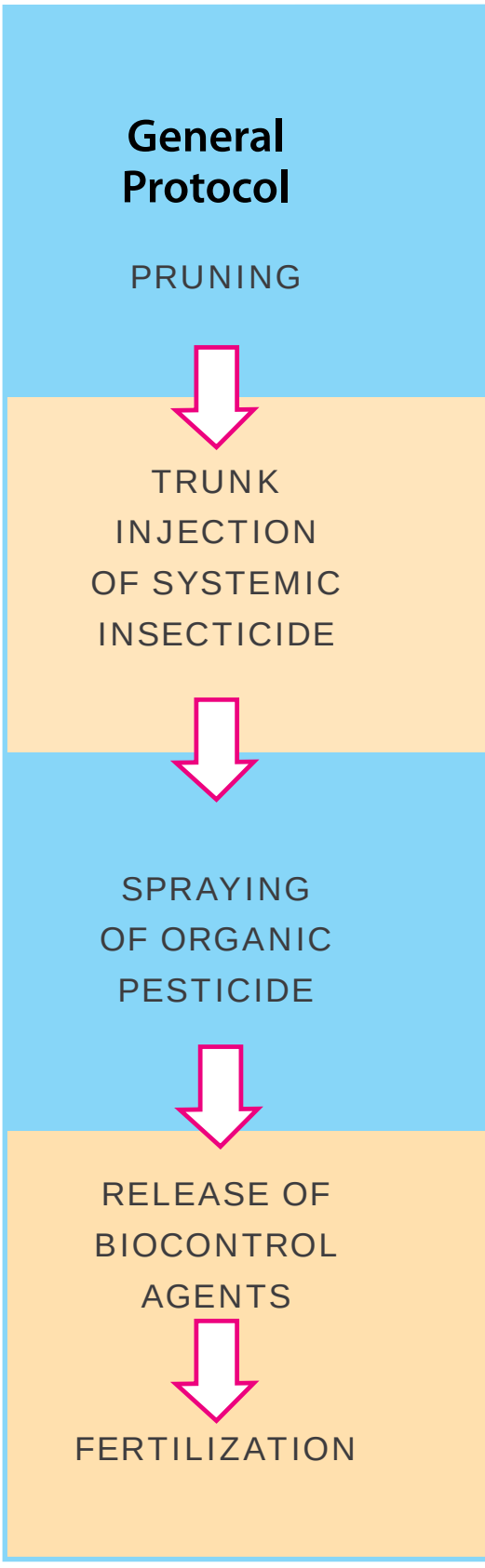
In response to Executive Order No 169 mandating government agencies to formulate and implement emergency measures to control and manage the spread and damage of CSI, the S&T-based Integrated Pest Management Approach to Manage the CSI Infestation (on the next page) was recommended.

Protocol

Moreover, assessment projects are underway to assess the efficacy of area-wide treatment using satellite imagery through Rapid National Biosurveillance and Early Warning System for Coconut Scale Insect to be led by the UP-DREAM LiDAR team. Biosurveillance system will use its satellite remote sensing capability to fast-track CSI monitoring and come up with early warning system.

Meanwhile, initiatives such as the "Study of the Ecological Systems" is a project involving the use of environment-controlled facility to look into the biology and relationships of crops and their pests/diseases and how they react to changes in climatic conditions, led by researchers from UPLB. Also underway is the science-based approach on "Identification, Risk Assessment, and Rapid Response to Invasive Pest Species of Agricultural Importance" by experts from De La Salle University. (With reports from Ricardo R. Argana, S&T Media Service, PCAARRD)

ESCONDO

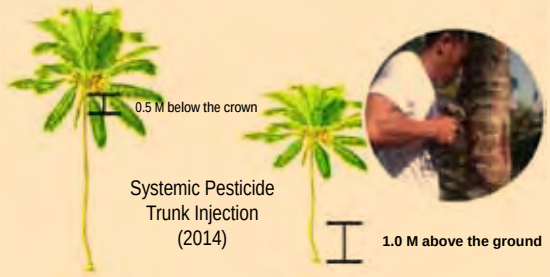


INTEGRATED PEST MANAGEMENT APPROACH TO MANAGE THE CSI INFESTATION

1. PRUNING

(1.) Harvest all harvestable nuts. Harvested nuts are subject to quarantine (2.) Prune the dried drooping leaves and infected leaves (3.) Expose underside of pruned leaves directly under the sun/rain to kill the csi (4.)Chop the pruned leaves into 3 or more parts to hasten drying (5.) Chopped leaves should NOT be moved outside the farmunder the sun/rain to kill the csi.

2. TREATMENT WITH SYSTEMIC INSECTICIDE THROUGH TRUNK INJECTION



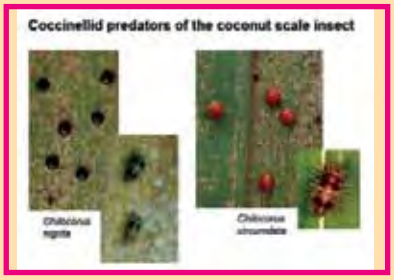
3. PROTOCOL FOR INSECTICIDE APPLICATION ROUGH TRUNK INJECTION

- Only FPA-approved organic-spray pesticides will be used
- The rate of application shall be based on FPA-approved recommendation
- Spraying may be done depending on pest population situation 30 days after trunk injection. Spray underneath the leaves

IV. PROTOCOL FOR BIOLOGICAL CONTROL AGENT

Mass produce biological control agents

Release the biocon agents 2 wks after spraying organic-based pesticide



Science and Technology-based Farm Project

Another strategy toward meeting the challenge of DOST's Outcome No. 1 is Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development's (DOST-PCAARRD) Science and Technology-based Farm Project or STBF. An initiative under the Techno Gabay Program, STBF selects a farm or enterprise to be used as a showcase of science and technology's (S&T) effectiveness in improving the income of farmers.

One of those selected was the small ruminant enterprise of Josue S. Balderama, Jr. from Nararagan, Ballesteros, Cagayan.
Mang Josh, as he is fondly called, pioneered some developmental techniques in SR farming, namely 1) establishing forage fences for livestock feeding, 2) integrating cattle and sheep into the citrus orchard with cattle and sheep, which led to 3) the replication of his orchard in other farms in the town.

PCAARRD chose his slaughter goat technologies to be showcased in a Science and Technology-based Farm (STBF) Project for the production of slaughter goats. He started with 30 upgraded does and a full-blooded Boer buck. He crossbred the does with the purebred Boer buck, weaned the offspring early (three months), and practiced integrated parasite control. Despite the unpredictable weather, none of his goats died. All were bigger and heavier, and had more kids.

Another selected farm was the peanut farm owned by Roger Salvador of Barangay Arubub in Jones, Isabela. Farming has been and still is a lucrative business to him through the years. He used to plan corn but later, he realized planting peanuts was more advantageous. Already in his 60s, Roger was able to send his three children to college to earn their degrees.

Roger's and Mang Josh's success as farmers are two of the many similar experiences of farmers emanating from the gains of STCBF to provide science-based know-how and tools that enable the agricultural sector to raise productivity to world-class standards.

outcome 2

ENTERPRISES

Boosting enterprise dev't via S&T

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

THROUGH SCIENCE, technology, and innovation, enterprise development is certainly possible.

The DOST regional offices play a pivotal role in this endeavor. Their direct link with the micro, small, and medium enterprises known as MSMEs, spells the difference between success and failure in creating a rock solid foundation for partnerships.

Enterprise Development is geared toward providing innovative, cost-effective and appropriate technologies that enable MSMEs to develop and produce competitive products that meet world-class standards.

DOST developed various strategies to help fulfill this, namely 1) Technology Innovations for SMARTER MSMEs; 2) Technical Assistance/ Consultancy Services; 3) Packaging Innovations for MSMEs; 4) Laboratory and Testing Services; and 5) Community Empowerment through S&T (CEST).

World-class SETUP products, interactive exhibits, infographics, audio-visual productions (AVPs), IEC materials, actual demonstration of laboratory analyses and technical consultation as well as simulated use of laboratory InfoSystem are available to the general public during the National Science and Technology Week. Technology clinics and various fora are also held. The idea is for each strategy to be a "total learning experience" for the viewers to appreciate that enterprise development can be achieved.

Strategy 1 was designed to provide focus on the top MSMEs assisted by the DOST through the trailblazing Small Enterprise Technology and Upgrading Program (SETUP). As a support activity, the "Smart Innovations for MSMEs: Celebrating SETUP Innovators" showcases successful entrepreneurs while celebrating emerging innovators through the awarding of Outstanding SETUP Adoptors for 2014.

Under Strategy 2, technical assistance and consultancy services in the areas of food

safety, energy audit, and cleaner production are also provided, as well as services such as the Consultancy for Agricultural Productivity Enhancement Program and the Manufacturing Productivity Enhancement Program.

Strategy 3 refers to innovative packaging services which lead to effective marketability of products. Appropriate packaging and product labeling are important elements to ensure that products are not only protected from damage during handling, storage and transport but also to guarantee that color schemes, designs and types of product packaging complement food safety and mandatory label information.

Parallel to this is the launching of the MSMEs Packaging Innovation Awards dubbed "STeP UP! or "S&T Packaging for Biz Upgrading" – a showcase of available DOST packaging technology assistance featuring distinguished resource speakers.

Meanwhile, under Strategy 4 is the DOST Regional Standards and Testing Laboratories (RSTL) and its ISO 17025 accredited testing services. In support of this is a forum titled "Food Safety: A Must, NOT Just a Choice" where experiences in the implementation of Food Safety Management System are shared.

With its heart warming program called CEST or 'Community Empowerment through Science and Technology', the DOST has implemented a new form of assistance to empower the poorest of the poor communities. Support to health and nutrition, water and sanitation, basic education and literacy, livelihood/economic enterprise development, and disaster risk reduction and climate change adaptation is given through the DOST regional offices via this integrated program which falls under Strategy 5.

In addition to the interactive exhibits is the forum dubbed "Malusog at Matalinong Mamamayan, Ligtas at Maunlad na Pamayanan" which highlights experiences from partner local government units, non-government organizations, recipient communities and Indigenous Peoples in the implementation of the CEST program. The activity highlights the commitment of DOST with the signing of the 'Panata.'

CLAVER

outcome 3

INDUSTRY

The Philippine Aerospace Industry: Now looking up

By ALAN C. TAULE
S&T Media Service, *DOST-STII*

THE AGE of Flight was ushered into the Philippines over a century ago, when the first airplane in Manila, a biplane, took to the skies on February 11, 1911 with American James C. Mars as its pilot.

At the time, the future bode well for this new and revolutionary mode of transport in the country, and in fact Philippine Airlines holds the honor of being the first-ever commercial aviation fleet in Asia. Yet for a number of reasons, the sector never really took off as expected.

Until recently, the Philippine aerospace industry was largely limited to maintenance, repair and overhaul operations (MRO in industry jargon), or the broad spectrum of assembly and maintenance services of aircraft manufactured in other countries, primarily the United States.

Under the administration of President Benigno S. Aquino III, the government, through the DOST's Philippine Council for Industry, Energy, and Emerging Technologies Research and Development (PCIEERD) and Metals Industry Research and Development Center (MIRDC) in cooperation with the Aerospace Industries Association of the Philippines (AIAP), is seeking to conquer new fields to include aviation and aerospace manufacturing. The timing couldn't be better.

A recent industry study conducted by MIRDC experts showed the global aerospace market is expecting to see major growth in the coming years. For commercial aircraft, passenger airlines as well as air freight and delivery companies are looking to replace their old planes as demand for their services continues to grow annually. Meanwhile, demand for highly-skilled, trained personnel for activities involving aircraft operations (for both civilian and military), airports, and air navigation services are expected to rise.

Meanwhile, major changes lie in wait with the ASEAN Economic Integration of 2015.

To keep in step with our Southeast Asian neighbors, partnerships among government, industry, and academe must generate new value streams arising from the development and sharing of intellectual resources.

Such developments fall hand in glove with PCIEERD's overall thrusts toward industry development.

The country is poised to revive its aviation manufacturing sector with the RP-S512, a locally-assembled two-seater light sport airplane that is easily transported and stored in much smaller hangar spaces because of its detachable wings.

According to Mr. Arturo "Art" Rivera IV of Omni Aviation, Inc., the company behind the RP-S512, the aircraft's wing locking system is based on a similar system proven safe and effective for use in sailplanes. He demonstrated that by pulling a pair of pins located at the back of the seats, the wings can be removed quickly by a minimum of two persons.

The system is designed so the plane's control and wiring connections are fully automatic. Most important, its ignition interlock will prevent the engine from running if the wings are not properly installed, a key safety feature that also demonstrates the ease by which the RP-S512's wings lock and unlock from the main body.

In addition to its unique features, the light aircraft is powered by a 100-horsepower engine that runs on basic unleaded gasoline. This makes fuel costs more economical than similar aircraft in its class using higher-octane aircraft gasoline, considerably more expensive and less readily available. With a few modifications, the engine can be made to run on ethanol, bringing fuel costs even lower.

Meanwhile, Captain William "Bill" Wright, Omni consultant for the RP-S512 project, said they are now awaiting certification from the Civil Aviation Authority of the Philippines (CAAP) for the aircraft. He added that in test flights, the plane was easily able to reach Cavite and even far away Lingayen, Pangasinan and back.

"Our overarching aim is to chart and bring about an environment that rewards risk-taking for Filipino entrepreneurs to invest in technology companies," said Dr. Rowena Cristina L. Guevara, PCIEERD executive director. She added the Council has targeted competitive industry and manufacturing as among its thrusts until 2016.

TAULE

outcome 4

IT-BPM

Closing in on 2016 targets

By AARON CAPA
S&T Media Service, *DOST-ICTO*

AS THE growth of the IT-BPM industry continues to gain momentum, DOST, through the Information and Communications Technology Office (ICTO) focuses on reaching its 1.3M target employment and $ 25B revenues by 2016.

With a total workforce reaching 900,000 in 2013, the IT-BPM industry is expecting to reach the 1 Million mark before the end of 2014. Last year, the industry earned US$ 15.5 billion in revenues. This is expected to reach 18 billion by the end of the year. On top of these, the Philippines remains as the top choice for voice services and second choice for non-voice services.

While the Philippines continues to be the leading destination for voice services, IT-BPM sectors such as healthcare information management, software, game development, animation and engineering services have contributed significantly to the country's employment and revenue generation. These sectors play significant roles as well in the country's IT-BPM campaign with its continuously expanding partnerships with the US, Australia, Japan, and UK.

The IT-BPM is one of the top industries that contribute to the inclusive growth of the country as you could see in terms of the number of direct jobs and the revenue it generates," stressed ICTO Executive Director Louis Napoleon C. Casambre, "By 2016, the IT-BPM industry is projected to contribute at least 10% of the nation's gross domestic product", he added.

As the country's main agency in handling the IT-BPM sector, ICTO continues to support the industry's growth through its various programs and collaborations with the different IT-BPM sectors. Just last May, the Philippines sent a delegation to the Software Development Expo, a renowned trade mission annually held in Japan. One of the key objectives was to sustain the country's branding as one of Japan's reliable global business partners for its IT and software service needs.

Furthermore, the agency is looking to contribute to the industry's growth and generate more jobs and opportunities through its two new key initiatives, namely the e-Commerce and the Rural Impact Sourcing program. The e-Commerce program, also known as the SeedPh program, aims to boost the development of the country's startup ecosystem and promote technopreneurship track as a viable career (http://icto.dost.gov.ph/index.php/news-events/current-news/153--dost-ict-office-kicks-off-seedph-startup-workshops-for-2014-).

The Rural Impact Sourcing program, on the other hand, is looking to generate economic and social impacts in untapped rural areas where there is high population but low employment due to lack of investors. Through the use of ICT, the program pushes for access to digital markets and Rural BPOs as tools for job creation (http://icto.dost.gov.ph/images/misc/pr_impact_sourcing_program.pdf).


CAPA

outcome 5

E-governance

Better government services with e-Government

By HERNAN S. MELENCIO
S&T Media Service, *DOST-ICTO*

GOVERNMENT SERVICES are expected to significantly improve once DOST's flagship e-government project, the Integrated Government Philippines project or iGovPhil, is fully deployed later this year or early next year.

In Metro Manila, the fiber optic backbone that will interconnect 160 government offices and provide them with high-speed communication is almost done, according to DOST Undersecretary Louis Napoleon Casambre, executive director of the Information and Communications Technology Office (ICTO) of DOST. The cables are set for last mile connection to buildings and the main data center. A similar fiber optic network project in Cebu will connect 12 government agencies. The networks are expected to be online before the year ends.

Casambre said the adoption of fiber optic technology will not only help government agencies coordinate faster but also facilitate other necessary services like cloud computing, data center co-location, web hosting, document and records management, email and online security. Its benefits, however, are realized only if implemented in conjunction with other components of the project, which are mostly complete and being pilot tested.

"Cloud computing, for instance, will be difficult to implement without broadband connectivity," he said.

By interconnecting government agencies, the DOST aims to integrate all their functions and simplify processes to better serve the public and make the government transparent.

According to Casambre, the iGovPhil project is actually composed of several projects considered to be the building blocks in the establishment of an e-government - which was the aim of the e-Government Master Plan (EGMP) launched last year.

The fiber optic cables connect government agencies to data centers where their information and data are stored in servers. Most of the services offered by iGovPhil, like government website hosting, email, cloud, online payment system, public key infrastructure, are launched from the data centers. A high-speed connection will enable agencies to collaborate on projects, share resources and save money in the process.

Fiber optic cables for aerial installation

Thus, the iGovPhil project is part and parcel of the EGMP which aims to lead the country toward IT competitiveness and economic prosperity.

Also being developed are registries on land, vehicles, businesses and citizens. Citizens' registries are existing in the forms handled by SSS, GSIS, NBI, DFA and other data gathering agencies. The data will just have to centralized and expanded

Meanwhile, the Medium-Term ICT Harmonization Initiative or MITHI, a component of EGMP which aims to standardize processes, make applications interoperable, facilitate collaboration and allow sharing of government resources, is on track.

Most government agencies have already submitted their Information System Strategic Plans (ISSPs) for 2015 to comply with the budgeting process. And by November all would have submitted their three-year ISSPs.

Priority projects identified with EGMP and MITHI include the following:

- The P 9-B Digitization Empowerment Fund which aims to provide government employees, from SG level 4 up, with laptops. For this year some 96,000 laptops are to be distributed. The plan, to be sourced from the E-Government Fund, also includes replacing old desktops from government offices.

- The Philippine Health Information Exchange, part of the P 150 million eHealth program of the DOH, which is being worked out to be a big database of information on health services, medicines and best practices. The health cluster is also a pilot for the implementation of the Philippine e-Goverment Interoperability Framework (PeGIF). Version 1 of PeGIF, which deals with technical interoperability, has been completed and version 2, on informational interoperability, is being developed.

Also in the works for EGMP is the Enterprise Architecture, a technical blueprint for the government.

NELENCIO

outcome 6

HEALTH

FNRI, partners unveil Pinggang Pinoy

By DIVORAH V. AGUILA
S&T Media Service, *DOST-FNRI*

THE TREMENDOUS increase in the number of cases of diet and lifestyle-related diseases worldwide has become so evident and alarming.

The nonstop global and technological advances of the modern world have helped make this possible. Yet, this trade-off in modern living exists not just in technologically-advanced countries but in developing nations like the Philippines as well.

Thus, more and more Filipinos, young and old, have become physically inactive, hypertensive, and overweight.

In response, the DOST-FNRI has committed to Outcome 6, which focuses on health. To help solve the problem and create a more health conscious citizenry, FNRI aims to provide Filipino consumers with easy to use visual tools to help them adopt healthy eating habits.

After fruitful collaboration with the World Health Organization, Department of Health, and the National Nutrition Council, FNRI unveiled one of these visual tools for healthy eating last July 4, 2014 during the Seminar Series on Food and Nutrition Researches and Science and Technology Activities at the DOST Compound in Bicutan, Taguig City.

Dubbed as "Pinggang Pinoy," the new tool serves as our blueprint for planning a healthy balanced meal. It is a quick and easy guide on how much to eat per mealtime.

However, "Pinggang Pinoy" should not be mixed up with the existing Daily Nutritional Guide (DNG) Pyramid for Filipinos.

The Pyramid was also developed by FNRI and shows at a glance the whole day food intake recommendation for Filipinos. It is a simple, trustworthy guide for choosing a healthy diet, founded on the concept that daily exercise and water strongly influence our chances of staying healthy.

The Pyramid builds from the base, indicating that we should eat more vegetables and whole grains which take up the bottom part of the pyramid, and less red meat, sugar, fats, and oils which take up the topmost portion. So based on the Pyramid, Filipinos are advised to eat more of the foods pictured at the lowest parts of the pyramid and consume less of the foods featured at the higher levels of the pyramid.

Combine this with the fact that most of us eat on a plate and you have this unmistakable partnership between the DNG Pyramid for Filipinos and "Pinggang Pinoy."

It is also important to note that "Pinggang Pinoy" and the DNG Pyramid are based on the latest scientific findings about how our food, drink, and activity choices affect our health.

Hence, it is appropriate to use "Pinggang Pinoy" not just as a guide for a typical balanced meal, but also as a complementary tool to the DNG Pyramid.

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

AGUILA

outcome 7

EDUCATION

More scholars, Stronger pillars

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

ROSE ANNE Manzano is poised to become valedictorian when she graduates in high school next summer. She dreams of being a civil engineer via the scholarship route. Belonging to the top of the class will certainly help her chances of landing a scholarship.

"Sana may scholarship kasi hindi naman kaya ni Papa ko (Hopefully, there would be a scholarship because Papa cannot afford it)," said Rose Anne whose father, their sole provider, is a farmer.

The availability of local scholarship grants for students like her in their town of Banayoyo in Ilocos Sur is somewhat of a rare find. Lack of information about national scholarship programs like that of DOST's Science Education Institute (SEI), along with others factors such as distance to government centers and poverty, further dim her chances of becoming a scholar.

Rosa Anne is just one of the prospective DOST-SEI undergraduate scholars from 71 municipalities nationwide who face these issues which cause the lack of applicants to the program.

From 2010 to 2012, 329 municipalities around the archipelago recorded 'zero' number of scholars. Seventy-one of these municipalities did not even have a single applicant possibly due to lack of awareness of the program, and/or other reasons pertaining to geography and socio-demographics.

In response to this reality and in view of fulfilling the Department's target of having at least one 'Science Scholar' per municipality, DOST-SEI launched a campaign called "#Push4Science: Maging DOST Scholar ka!", a strategic marketing program that hopes to encourage applicants from the 71 identified municipalities.

Since February this year, the Push4Science Team has been conducting extensive scholarship caravans in target municipalities including Banayoyo where Rose Anne resides. The campaign has specifically reached Baras in Catanduanes; Burgos, San Benito, and San Isidro in Siargao Island; Adams and Dumalneg in Ilocos Norte; and Burgos, Quirino, San Emilio, Sugpon and Banayoyo in Ilocos Sur.

Push4Science Campaign in Baras, Catanduanes

Former DOST Scholar Mark Anthony Castro from Virac, Catanduanes talks about his journey from scholar to teacher at the Catanduanes State University.

Lined up for the rest of 2014 are municipalities in Abra, Isabela, Nueva Ecija, Tarlac, Pangasinan, Masbate, Palawan, Antique, Misamis Occidental, Davao Oriental, and Saranggani. Other municipalities will be reached through the DOST regional offices and Provincial Science and Technology Centers.

"We really have to go there and talk to high school students so we can inspire them and convince them to pick science as a field of study and do so by being DOST Scholars," said Dr. Josette Biyo, DOST-SEI's new director.

The campaign has been crucial not only in informing students like Rose Anne of the benefits of the scholarship but also in delivering key promotional materials and application forms for the program.

While lack of awareness about the opportunity seems a common issue among the municipalities, their distance from the application and testing centers is another major issue.

Banayoyo is one hour away from Vigan, the nearest testing center. Municipalities like Adams in Ilocos Norte, a 5th class town located in the forest, for instance, requires four to five hours of travel to Batac where the testing site is located. Lack of public transportation from the said area—a newly declared Wildlife Protected area—makes it even more difficult for students to apply and take the qualifying exam.

In these cases, the support of the local government units (LGU) is a must. The Push4Science Team ensures commitment from concerned LGUs to support in the whole application process of their high school students as a form of "investment" for molding future experts of their municipality.

"Providing a vehicle for the submission of application forms and during the examination day is already a huge gesture of belief from the local leaders that their kids can make it as DOST Scholars," Biyo said. "That will help us achieve our goal not just of having applicants and scholars but ultimately of developing scientists and engineers in these areas."

Indeed, all it takes is little bit of "push" and encouragement for our kids to nail that chance of becoming impact players. As we produce more highly skilled professionals from these scholars, we are building stronger pillars for this nation as well.

MELGAR

outcome 8

DISASTER PREPAREDNESS

"Science nation" on disaster mitigation and preparedness

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

WORKING CLOSELY with DOST for Outcome 8 are PAGASA, PHIVOLCS, Project NOAH, and UP DREAM (Disaster Risk and Exposure Assessment for Mitigation) .

Project NOAH, with its website (www.noah.dost.gov.ph), generates information on typhoons, rainfall probability, historical flood maps, weather monitoring, and recently selected data on storm surge and landslides. It can be downloaded through mobile apps using Android technology. This platform was done in cooperation with other agencies like PAGASA, the Advanced Science and Technology Institute, ClimateX, UP DREAM, and other entities.

Implemented by the University of the Philippines Training Center for Applied Geodesy and Photogrammetry and DOST, the DREAM project uses cutting-edge technology in disaster science research to generate high-resolution, detailed and up-to-date national elevation maps and data sets using light detection and ranging (LiDAR) for the 18 critical river basins in the country. LIDAR technology, widely used in the UK for the past 16 years, offers 3-dimensional laser scanning and mapping. DREAM generates flood hazard modeling and maps using data that will allow early warning of at least six hours.

Currently, DREAM is working on its second phase - LiDAR survey and mapping for use in agriculture, forestry, coastal areas, watersheds, and renewable energy.

Meanwhile, PAGASA embarked on its modernization program to eventually allow for a 7-day weather forecast. Additional Doppler radars will be installed to augment the existing 10 radar stations and bring it to 15 by 2016. Later on, PAGASA will be capable of giving seasonal forecasts.

PHIVOLCS, on the other hand, is beefing up its earthquake monitoring network. PHIVOLCS has a total of 69 seismic stations. There are 33 unmanned, real-time seismic stations with VSAT and 36 manned stations equipped with telephone and internet connections. The agency is targeting 85 seismic stations by 2016.

One of the DREAM LiDAR planes being used to survey the 18 major river basins in the Philippines (Photo courtesy of www.science.ph)

PAGASA weather balloon ready to be released (Photo courtesy of www.veooz.com)

The Tsunami Monitoring Network is in place with real-time tide gauges that are strategically located. At present there are five stations, which PHIVOLCS aims to increase to 20 by 2016. The agency maintains 10 tsunami detection stations including those in Subic Bay, Manila Bay, and Batangas Bay.

PHIVOLCS also produced the Broadcaster's Info Chart, a communication tool geared at helping media practitioners disseminate proper and accurate information on natural hazards.

At the 2014 National Science and Technology Week, PAGASA features the weather balloon and a mobile planetarium, a scaled down model of the solar system equipped with vivid representations of the different planets and stars with a play of colorful lights and sounds.

For PHIVOLCS, the main feature is centered on mini-scale models showing the kinds of geologic hazards and specific calamities that hit the country. These include the 1990 earthquake and the 2013 Bohol earthquake. Also featured are PHIVOLCS' Rapid Earthquake Damage Assessment System or REDAS software, and maps of the different volcanoes in the country and the West Valley Fault [using 3D glasses].

Meanwhile, Project NOAH showcases the NOAH website Version 2.0 and the Monitoring and Operating System for Emergency Services or MOSES Tablet.

On display for UP DREAM is a scale model of LiDAR 2 showing its non-disaster related applications for agriculture, forestry, coastal areas, watersheds and renewable energy.

DE GUZMAN

"Organs-on-chips" to revolutionize drug development

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

A "BREATHING", "beating" chip the size of a small USB stick, may one day replace animals in testing the safety and efficacy of potential drugs and save at least a third of the time and half of the cost in drug development.

These "organs-on-chips" are currently being developed by USA's National Center for Advancing Translational Sciences-National Institutes of Health (NCAT-NIH) in partnership with Food and Drug Administration and Defense Advanced Research Agency. This was revealed Dr. Danilo A. Tagle, NCAT's associate director for special initiatives in a recent scientific symposium organized by the Philippine Genome Center (PGC).

Organs-on-chips are designed to mimic the mechanical and chemical function of organ systems (respiratory, circulatory, etc). In a lung-on-chip, for instance, human lung and blood vessel cells line each side of a flexible porous membrane that stretch and relax upon application of cyclic suction to mimic the breathing action of human lungs.

Dr. Tagle noted that the whole process of developing these chips involves many disciplines such as engineering, biology, microfabrication, and toxicology among others.

These organs-on-chips would address the inadequacy of animal models in pre-clinical trial stage. "Animal models are not really representatives or predictives of human condition," Dr. Tagle pointed out.

Dr. Danilo Tagle, associate director for special initiatives of the National Center for Advancing Translational Sciences, is one of the brains behind the "organs-on-chips" that may one day replace animals in pre-clinical trials to accelerate drug development. *(Photo by Gerry Palad, S&T Media Service, DOST-STII)*

NCAT scientists hope that through organs-on-chips, drug developers may be able to predict adverse events earlier to allow their prevention and mitigation, and be able to identify the population who will earlier respond to a new drug, thus accelerating drug development.

Currently, drug development process takes around 15 years or more. Pharmaceutical Research and Manufacturers of America 2005 data indicate that out of 10,000 potential compounds screened for drug development, only 11 compounds reach the clinical trial stage and only one gets approved for human use.

The project targets to build 10 chips for each organ system and link them together to simulate a whole body system.

The scientific forum is part of the launch of the PGC's Bioinformatics Core Facility. PGC is a flagship project of University of the Philippines and Department of Science and Technology that aims to advance our capacity in genomic research.

Bikini beauties in nutrition crash course

By DIVORAH V. AGUILA
S&T Media Service, *DOST-FNRI*

THE FOOD and Nutrition Research Institute of the Department of Science and Technology (DOST-FNRI), in a tie-up with Slimmers World International, provided a holistic nutrition training for the 30 candidates who vied for the recent 2014 Miss Bikini Philippines title.

Esteemed as the biggest bikini pageant in the country, the contest aims to promote the healthy, fit and beautiful lifestyle among Filipinos, especially among the young generation.

"A lot of people are now conscious about the foods they eat due to the increasing cases of lifestyle diseases like obesity, diabetes and cardiovascular diseases," Dr. Mario V. Capanzana, FNRI director, said when the finalists of the Miss Bikini Philippines 2014 went through a half-day crash-course in nutrition at FNRI on April 30, 2014.

"Health buffs are now meticulously choosing the kind and amount of foods they consume and the type of physical activity they engage in. Thus, the fit and fun activity for the candidates was timely," Capanzana added.

Dubbed as "Fit and Fun under the Sun: A Nutrition Crash-Course Project", the customized half-day activity was intended to deepen the candidates' knowledge in nutrition. It included practical tips in assessing body mass index (BMI).

Just before lunchtime, the candidates, together with the FNRI employees, had aerobics at the FNRI arena.

As a special treat, the candidates and the Slimmers World staff tasted and experienced some of the products from technologies developed by the Institute. These included veggie noodles (canton noodles with squash and saluyot), healthy juices (carrot-mango and carrot-pineapple), and nutritious curls (rice-mongo curls).

Last May 13, Hazel Joy Ortiz, 19, bagged the title "Miss Bikini Philippines 2014." As title holder, she will serve as the Philippine ambassador for slimming, health, fitness, and beauty, and represent the country in the international pageants. *(S&T Media Service)*

DOST, UP break ground for Genome Center. DOST Undersecretary for Scientific and Technological Services Fortunato T. De La Peña (4th from left) and UP President Dr. Alfredo E. Pascual (5th from left) lead the groundbreaking ceremony of the Philippine Genome Center (PGC) building in University of the Philippines Diliman. The PGC is a multidisciplinary institution for basic and applied research for development of health diagnostics, therapeutics, DNA forensics and preventive products, and improved crop varieties. Also in photo are (L-R) DOST Assistant Secretary Raymund E. Liboro, PGC Program Director for DNA Sequencing Core Facility Dr. Cynthia Palmes Saloma, DOST-Philippine Council for Health Research and Development Executive Director Dr. Jaime C. Montoya, PGC Executive Director Dr. Carmencita D. Padilla, DOST-Philippine Council for Industry, Energy and Emerging Technology Research and Development Executive Director Dr. Rowena Cristina L. Guevara, UP Diliman Chancellor Dr. Michael L. Tan, PGC Program Director for Biodiversity Dr. Gisela P. Concepcion, and PGC Program Director for Agriculture Dr. Rita P. Laude. *(Photo by Henry A. de Leon, S&T Media Service, DOST-STII).*

Genomics research hub to rise in UP Diliman

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

THE GROUNDBREAKING ceremony for the Philippine Genome Center building last April 10 signaled the advancement of genomics research and development in the country.

Established in 2009, the PGC is an ambitious joint project of the University of the Philippines (UP) and Department of Science and Technology (DOST) that aims to tap genomics—the study of an organism's complete set of DNA—to improve crops, conserve biodiversity, improve disease diagnostics, and aid in forensics, among others.

Dr. Carmencita Padilla, PGC's executive director, said that this day is a significant beginning for her and all the people behind the PGC. She recounted that back in 2009 only four people were involved in PGC. "Now we have more than 60 research assistants and 20 project leaders," she said.

The construction of the PGC building is expected to be completed in one year. The PGC is temporarily housed at the National Institute of Molecular Biology and Biotechnology (NIMBB) at the National Science Complex in UP Diliman.

Dr. Padilla acknowledged DOST's support to the PGC in the last five years. "(DOST) believed that genomics can make a difference in the lives of people," she said. She further revealed that DOST has provided PhP 600M for PGC.

In his message, DOST Undersecretary Fortunato T. De La Peña said that PGC is "part of our goal to be world class and competitive" and said that UP and its research centers can expect more support from the DOST in the coming years.

Likewise, UP President Alfredo E. Pascual remarked that the construction of PGC building is another landmark achievement for the university as it builds itself as a research-intensive university. "It will add to the skyline of the National Science Complex," he said.

The new home of the PGC will be on A. Ma. Regidor Street across the PAG-ASA Observatory, and behind the newly-constructed NIMBB in the National Science Complex in UP Diliman campus.

It will house three core facilities, namely the DNA Sequencing Core Facility, Core Facility for Bioinformatics, and Biobank Facility as well as the offices and research laboratories of the PGC's five research programs namely Agriculture/Livestock/Fisheries; Biodiversity for Drug Discovery and Bio-energy; Ethics, Legal and Social Issues; Forensics and Ethnicity; and the Health Program. Currently, the PGC Core Facilities and offices are being housed in NIMBB.

Secrets of the sweetest and juiciest mangoes revealed

By CHRISTIE A. SURARA
S&T Media Service, *DOST-PCAARRD*

mamiverse.com

DURING THE last five years, there has been a decline in the production of mangoes due to pest and diseases affecting plantations all over the country. Of the more than 550 metric tons produced in the country in 2010, only about 10 percent was exported apparently for failure to meet quality standards.

But now, secrets to ripening of the sweetest and juiciest calcium carbide-free mangoes has been revealed!

Thanks to the technology called automated hot water treatment (AHWT) for mangoes, developed by the Mariano Marcos State University (MMSU). Through the AHWT, the problems of mango growers who have been losing about 30 percent of their harvest due to anthracnose and stem-end-rot (diseases of ripening mangoes) can now be resolved.

The first of its kind in the country, the AHWT guarantees clean, latex-free, sweet, and juicy mangoes with longer shelf life.

Through a P1.5-million research grant from the Department of Science and Technology (DOST), the design and development of the AHWT was spearheaded by Thomas Ubiña, and other technical experts from MMSU namely, Samuel Franco, Willen Mark Manzanas, Romaric Ascaño, Dr. Gliceria Pascua and Prof. Maria Luisa Gabriel.

According to Ubiña, the technology was designed to help mango producers increase their income by reducing the cost of post-harvest handling. Aside from enhancing the flavor and appearance of the mangoes, the technology also significantly lowered the occurrence of mango diseases compared to untreated mangoes.

The AHWT is a user-friendly machine with easy-to-adjust temperature and speed settings. It is energy-efficient and has the capacity to isolate immature mangoes when they float at the conveyor filled with lukewarm water. The production cost of the AHWT is about P425,000, but according to Ubiña, the amount can still be reduced for commercialization.

The machine can treat as much as 1,361 kilograms of mangoes for one-minute immersion at a treatment cost that ranges from 20 centavos to P1.00 per kilogram.

With continued innovation and technology advancement, DOST hopes to help more micro, small and medium enterprises to become competitive in the global market. In addition, the University of the Southeastern Philippines (USEP) will be coming up with an integrated automatic sorting and packaging line as take-off point from the Research and Development gaps of these technologies. The USEP project that will end in May 2014 will be conducting several tests to determine the best interaction of temperature and time of immersion of the material for optimum effect.

The project "Design and Development of an Automated Hot Water Treatment for Mango" was recipient of the second prize award in the Research and Development (R&D) Category during the recently concluded National Symposium on Agriculture, Aquatic and Resources Research and Development (NSAARRD) held at PCAARRD headquarters in Los Baños, Laguna. The said award was conferred during the Council's R&D Exhibits and Awarding Ceremonies held recently at Sofitel Philippine Plaza Manila in Roxas Boulevard, Manila.

The R&D awards are conferred on deserving individuals and institutions who helped shape up the country's agricultural landscape.

SURARA

Summer is the best time to fight dengue mosquitoes, DOST study shows

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

TO SHOO away dengue-causing mosquitoes especially when the rains come falling, destroy the breeding sites now while the sun is at its hottest.

This is according to Dr. Frances Edillo of the University of San Carlos, based on a 2012 study showing that the month of April registered the highest minimum infection rate of *Aedes aegypti*, the more common carrier of the dengue virus in the country.

This came after a major finding that mother *Aedes* mosquitoes transmit the dengue virus to their offsprings. Thus if the larvae and pupae infected with dengue virus survive summer and become mosquitoes in the following rainy season, these mosquitoes could set off an epidemic among humans.

The study was done in four sites in Cebu City where Edillo's research team observed a small number of dengue cases during dry season. However, the rainy season saw a hike in the number of cases.

The research team used Polymerase Chain Reaction (PCR), a technique for making multiple copies of a gene from a sample DNA. Using the technique, the team found from the samples three of the four dengue serotypes, namely DENV-1, DENV-3, and DENV-4.

Edillo revealed her team's findings during the 32nd anniversary celebration of the Department of Science and Technology-Philippine Council for Health Research and Development.

Dengue mosquito larvae. (Photo by Ceajay N. Valerio, S&T Media Service, DOST-STII)

A visit to the BSU research and demonstration farms. The Argentinian experts also observed the transactions at the Trading Post for Vegetables in La Trinidad, Benguet.

PCAARRD-SENASA collaboration pursued

A PROJECT between PCAARRD and the Servicio Nacional de Sanidad y Calidad of Argentina will pave the way for the sharing of practices and technologies in the vegetable production chain between Argentina and the Philippines.

An offshoot of an agreement on technical cooperation between the two countries which was signed in Buenos Aires on August 24, 2011, the PCAARRD-SENASA project on vegetables aims to improve the quality and increase the production of crops of mutual interest. These crops include tomato, onion, cabbage, eggplant, squash, bean crops, pole sitao, cucumber and garlic.

Corollary to the said project, a team of technical experts from Argentina visited laboratories and experimental farms on conventional and organic farming as well as project sites of PCAARRD regional partners. The visit provided them the opportunity to observe different farming, post-production, and marketing practices.

Laboratories and project sites visited by the team were those of Benguet State University (BSU) in La Trinidad, Benguet; Mariano Marcos State University in Batac, Ilocos Norte; University of the Philippines Los Baños-National Crop Protection Center; and the Bureau of Plant Industry –Los Baños, National Crop Research and Development Center, and even the Fertilizer and Pesticide Authority in Quezon City.

The team also had the chance to visit the Fertilizer and Pesticide Authority in Quezon City in connection with their pest and disease management concerns.

The team was composed of Engr. Esteban Sampietro, coordinator of the Federal System for the Fiscalization of Agrochemicals and Biological Products; Engr. Daniel Mazzarella, technical consultant at the Office of Agrochemicals and Biological Products; and Sabina Zazo, communication expert at the Office of Hygiene and Safety of Products of Vegetable Origin and Feeds of SENASA. Included in the PCAARRD-SENASA collaboration are four major areas of concern: biopesticides/integrated pest management; good agricultural practices; peri-urban agriculture; and policy issues in monitoring the minimum residual limit for the identified vegetables.

After the exploratory visit of two technical experts from the Philippines to Argentina and the discussion of the project proposal as required by Argentina, details of the collaboration will be finalized through the appropriate channels and protocols. *(S&T Media Service)*

PBSAP now includes agrobiodiversity and urban biodiversity

By MARIAN S. MARASIGAN
S&T Media Service, *DOST-PCAARRD*

AGROBIODIVERSITY AND urban biodiversity now form part of the proposed Philippine Biodiversity Strategic Action Plan (PBSAP).

The inclusion of the said areas in the PBSAP which was drafted pursuant to the country's commitment to the UN Convention on Biodiversity, is an offshoot of a recent roundtable discussion held at the PCAARRD-DOST in Los Banos, Laguna. Agrobiodiversity covers equally-important species for food and agriculture, genetic, and non-harvested resources. Experts consider the addition relevant since existing conservation efforts focus only on forest, freshwater and marine ecosystems.

Representatives in the round table discussion were key agencies in biodiversity issues.

These agencies include the Biodiversity Management Bureau, Crop Science Cluster-University of the Philippines Los Baños (UPLB), Philippine Fiber Development Authority, Southeast Asia Regional Initiatives for Community Empowerment, Philippine Rice Research Institute, Magsasaka at Siyentipiko para sa Pag-unlad ng Agrikultura, Indigenous Community Conserved Area, Philippine Coconut Authority, Bioversity International, National Museum of the Philippines, United Nations Development Programme, Ateneo School of Government, ASEAN Centre for Biodiversity, and Institute of Agroforestry-UPLB.

The revision considered important issues contained in the original PBSAP draft such as conservation strategies and sustainable use and biodiversity-friendly practices in agriculture as well as important concerns on genetically modified organisms. It has likewise considered concerns and measures in achieving proposed targets.

Lives lost or put on hold – these were the remnants of Yolanda, which devastated the Visayas islands, particularly Region VIII, with Jaro, Leyte and Basey, Samar as two of the most shattered towns. **Ramil T. Uy Sr.** files this report to relate how DOST comes to the rescue.

CEST' la vie

How DOST helps rebuild lives of Yolanda victims

Community Empowerment is about building active and sustainable communities.

Engr. Mario G. Montejo
Secretary, DOST

By RAMIL T. UY, SR.
S&T Media Service, *DOST-VIII*

Yolanda left these two towns in ruins and several inhabitants homeless and unemployed. People to this date rely on relief efforts initiated by the Philippine and foreign governments. However, relief operations are not forever. It then becomes important to implement practical mechanisms to empower the people who live in these areas.

In his visit to Jaro and Basey, Secretary Montejo said,"Kinahanglan natong ud buliganin inga mga para gumanga biktimahan bagyo nga makatindog otro ha ira mga panginabuhi. Kami ha DOST, naniniguro nga makabulig pinaagi hin syensya ngan teknolohiya.(We really need to help these farmers that were victims of the typhoon to recover their livelihood. We at DOST are trying hard to help through science and technology).

Sec. Montejo checks a wood plank used by the furniture shop in Marabut, Samar.

DOST's response to help farmers regain their livelihood is a program called Community Empowerment through Science and Technology (CEST) which, according to Sec. Montejo will help alleviate poverty. CEST provides community-based livelihood that will be run by the community itself through respective LGUs and the people.

Sec. Montejo demonstrates the use of ceramics filter to Mayor Rolando T. Celebre of the Municipality of Jaro. With them are DOST VIII Regional Director Engr. Edgardo Esperancilla (in green t-shit) and FNRI Director Dr. Mario V. Capanzana (in red shirt).

The project lays down S&T interventions to improve the economic condition of the municipalities of Jaro, Leyte and Basey, Samar. In particular, the CEST program will:

- provide technology and innovation support system to boost the production efficiency of the existing small enterprises in the area;
- conduct trainings and provide technical consultancy that will serve as corridors for livelihood opportunities for the community;
- establish an S&T information center to motivate intellectual enrichment in the community;
- introduce highly nutritious supplemental food products developed by DOST- Food and Nutrition Research Institute to address the gap between health and malnutrition;
- install Automated Weather Station facilities that will raise awareness and help build people's resilience to climate change; install water purifying system stations in Basey and Jaro barangays that have no access to potable water.

The CEST program components will be implemented by various DOST agencies such as the FNRI, Philippine Council for Agriculture and Aquatic and Natural Resources

CONTINUED ON PAGE 82

Knowing more about the environment has just been made more fun by nine new interactive exhibits sponsored by the Department of Science and Technology – Philippine Council for Industry, Energy and Emerging Technology (DOST-PCIEERD). **Framelia V Anonas** walks us through these amazing "science displays."

Nine fun ways to learn about the environment

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

Set up at the Science Centrum in Marikina City, said interactive exhibits explain the effect of wastes, how to minimize waste and maximize the use of energy to protect the environment.

Battle of the Bulbs. Incandescent, halogen, compact fluorescent lamp (CFL), and light-emitting diode (LED) bulbs were installed in respective compartments to compare their efficiency in terms of brightness, life span, electric consumption, and amount of heat generated.The LED bulb appears as best choice for those who want to maximize resources as it had the brightest light, longest life span, and least power consumption.

Recycling. Some materials in the garbage, considered as waste, can actually be processed back into their original, raw form and used in making the same material or other products.

E-Waste. Recycling electronic wastes are best left to the pros because backyard recyclers are exposed to health risks when they extract valuable materials from electronic devices.

Biogas. This exhibit shows how biodegradable wastes produce methane gas that can be used as fuel for the kitchen stove. A digester tank is filled with biodegradable wastes, and produces bubbles on the other tank which is filled with water. Methane, produced by microorganisms breaking down the wastes, causes the bubbling.

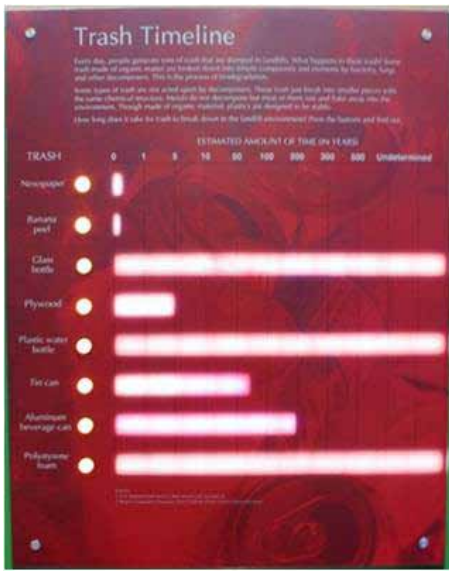
Which is the best choice? Below: Compact fluorescent (CFL), halogen, light-emitting diode (LED), and incandescent lamps.

Let's recycle! Just turn the knob to see what new products can be produced from steel cans, plastic containers, and paper.

Phantom Power. Putting appliances on standby mode does not really turn them off, as they continue to use electricity. A television set, for example, consumes 8.2 watts in stand by mode. Chargers and extension cords do consume electricity when plugged in, even if they are not connected to gadgets or appliances. To save power, experts advise to pull the plug off the wall socket.

Trash Timeline. Garbage matters do not decompose at the same rate, or may not decompose at all. Newspapers, for example, decompose within a year, plywood in eight years, tin cans in more than 50 years, while glass bottles and styrofoams may not decompose at all (undetermined).

E-Waste



Trash Timeline

Mountain at left has no vegetation while the one on the right has plenty. Pressing the button in front of the exhibit lets go of the "rain", and viewer can actually see runoff cascading from the barren mountain, flooding the valley below.

Biogas

Dual Flush Toilet

Water...Every drop counts

Dual Flush Toilet. This kind of toilet is now commonly used, with the half button for liquid waste and the full button for solid waste. But do you know how much liters of water are used in flushing your waste? Three liters of water are actually used to flush down liquid wastes, and six liters for the solid ones. Thus, using dual flush will help bring down our monthly water bill.

Surface Runoff. Lowlands at the foot of bare mountains get easily flooded during a heavy rainfall compared with lowlands at the foot of mountains full of trees and vegetation. It is because water is absorbed by the trees and vegetation, preventing floods and other risks.

Water... Every Drop Counts! This exhibit shows how much water you use in some activities and how you can save water by trying other alternatives. For example, car washing using a garden hose makes you spend 122 liters of water but when you use a pail, you only spend 35 liters. Taking a bath under the shower uses up 148 liters but the Filipino way of using pail and dipper ("tabo") is much more economic at 30 liters.

All of the said exhibits have button controls such that even young kids can enjoy the experience of viewing and using them. Come vist these exhibits at the Science Centrum, open Mondays to Saturdays, 8am to 5pm at the Riverbanks Center in Marikina City.

C'EST LA VIE...from page79

Research and Development (PCAARRD), Food and Nutrition Research Institute (FNRI), Science and Technology Information Institute (STII), Industrial Technology Development Institute (ITDI), Forest Products Research and Development Institute (FPRDI), and the Metal Industry Research and Development Council (MIRDC). Other agencies that will be involved in the program are the Visayas State University (VSU) that has expertise in R&D in agriculture, and the Department of Labor and Employment (DOLE) through its Rehabilitation Assistance on Yolanda (RAY).

Sec. Montejo delivers his message to the people of Jaro, Leyte.

Package of assistance to MSMEs

The Secretary likewise visited a SETUP-assisted furniture production business based in Brgy. Legaspi in Marabut town. SETUP, or Small Enterprise Technology Upgrading Program, is DOST's package of assistance that offers technology innovations to improve the operations and expand business reach of micro, small, and medium enterprises. Marabut, meanwhile, is among Samar's most devastated towns hit by Yolanda.

Furniture shop owners Ludigarion Cinco and wife Vilma informed the Secretary during his visit that most of their wood materials for furniture making were swept away by the rushing water that engulfed their production area as well as their house. For others, this loss is devastating but the entrepreneur in Vilma pushed the business to rise from the muck and the shop was soon awhirl with projects, churning various furniture and other wood based items.

After eye-opening talks with other CEST Program beneficiary-municipalities, Sec. Montejo and his party went to visit some other typhoon affected areas in Tacloban City. A dinner meeting with Leyte Gov. Leopoldo Dominico L. Petilla brokered possible DOST assistance to other affected Leyte municipalities. Montejo identified several projects and, along with Engr. Edgardo Esperancilla, DOST-VIII regional director, discussed exhaustively other possible areas of cooperation between DOST and the provincial government to address the needs of the communities.

Sec. Montejo's visit promoting the CEST program gave embers of hope to the local executives and constituents of Jaro, Leyte and Basey, Samar, assuring them of a partner in their rehabilitation efforts. To help "put back the lives" of aggravated constituents is the marching order given by Sec. Montejo to DOST VIII, thus the regional office takes the lead in implementing the program at the soonest possible time.

Community empowerment is indeed high on the current policy agenda of the government. The DOST is leading the drive to "enable more people to play an active role in the decisions that affect their communities," so said Sec. Montejo. Currently, the Department has introduced practical mechanisms to contribute to community empowerment, such as industry development, health and nutrition, basic education and literacy, public safety, agriculture, and fisheries. There is also a need for comprehensive understanding of what community empowerment looks and feels like.

As Sec. Montejo said, "Community empowerment is about building active and sustainable communities."

"It is about changing structures to remove the barriers that prevent people from participating in the issues that affect their lives," he added.

AN

Sec. Montejo gives directive to DOST VIII for the fast-tracking of the CEST program implementation.

New regional director of DOST VII

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

(Photo by Ceajay N. Valerio, S&T Media Service, DOST-STII)

ENGR. EDILBERTO L. Paradela, the new regional director of the Department of Science and Technology-Central Visayas (DOST-VII) office took his oath before the Management Committee of the DOST last June 2, 2014 at the Philippine Nuclear Research Institute, an agency under the DOST System.

"I am very thankful to the Lord Almighty for this position as I can fully serve the Central Visayas communities and to my family, DOST family, and colleagues who have inspired and trusted me to this position," he said as he vowed to continue the S&T programs initiated by his former superiors.

A graduate of electrical engineering at the Cebu Institute of Technology University, Dir. Paradela also holds a Masters Degree in Information Technology from Cranfield University, United Kingdom. He specialized in Information Systems Analysis and Development, Expert System or Knowledge Based and Database Management System.

Prior to his appointment, Dir. Paradela was regional coordinator of the Central Visayas Energy Audit Team that organized the development of local energy auditors and spearheaded the establishment of Regional Energy Auditors Teams in five DOST regional offices.

In 2011, he was certified as ASEAN Energy Manager by the ASEAN Energy Management Scheme — the world's first regional certification system for energy managers and energy end-users. He is also recognized as a National Expert on Energy Management System ISO 50001 under the Philippine Industrial Energy Efficiency Project – a joint initiative of the Department of Energy and the United Nations Industrial Development Organization.

Engr. Paradela has been in government service for 28 years, starting as a science research specialist I at the Philippine Invention Development Institute of the National Science and Technology Authority based in Central Visayas (now DOST).

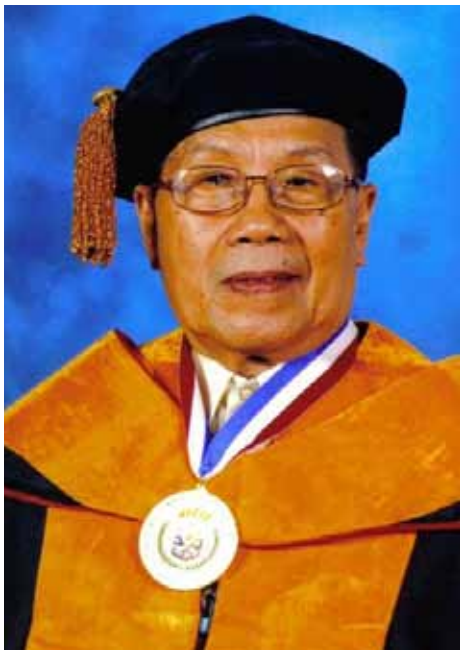
Trono, Alcala, Barba

bolster Phl's roster of National Scientists

By DARVIN S. ROSA
S&T Media Service, *DOST-NAST*

Gavino C. Trono Jr.

NATIONAL SCIENTIST Gavino C. Trono Jr. specializes in seaweed biodiversity, biology, ecology, and culture. In fact, he considers seaweed culture as the most environmentally friendly and productive livelihood for fisherfolks. Not only does he believe in this; he also uses this idea as an advocacy.



Thus, he established the largest phycological herbarium in the country —the G.T. Velasquez Herbarium in the Marine Science Institute of the University of the Philippines, which houses more than 70,000 curated herbarium specimens of the seaweed flora.

Plus, he was instrumental in the development of degree programs in the marine and biological sciences, mentoring graduate students, and in promoting seaweed research and sound coastal resources management.

Yet, it is his extensive research work on seaweeds that is the major highlight of his accomplishments.

In particular, he is credited for his extensive studies on the culture of *Eucheumadenticulatum,Kappaphycusalvarezii, Gracilaria spp.*, *Caulerpalentillifera*, and *Halymeniadurvillaei* seaweed which benefited thousands among the coastal populations. He was the first to report the occurrence of "ice-ice" disease which has caused tremendous loss of biomass in seaweed farms. He also published papers on the open water and pond cultures of Gracilaria, pond and lagoon culture of *Caulerpalentillifera* and culture and management of stocks of Sargassum. In addition, he also led a team in a field survey and assessment of coastal areas in Western Mindanao which identified sites in Sakol Island in Zamboanga and Tapaan Island in Siasi, Sulu where the commercial seaweed farms were established in 1972.

All in all, he successfully implemented 45 research projects, which resulted in the publication of 142 papers consisting of 20 ISI and 120 technical papers. He was also able to describe and publish 25 new species of marine benthic algae. In particular, his first major publications on marine algae in the Northern Tropical and Western Pacific expanded and altered knowledge on the geographical distribution of benthic algae in Central and Western Pacific.

Among his awards and citations are the "Likas Yaman Award" from the Ministry of Natural Resources (Philippines) in 1978, UP Alumni Award In 1979, and Plaque of Recognition for his outstanding scientific contributions to the advancement of the science of phycology in the Philippines by the Asia Pacific Society of Applied Phycology in 2006.

NS Trono obtained his Bachelor of Science in Botany from the University of the Philippines Diliman (1954), Master of Science in Agricultural Botany from the Araneta University (1961), and Doctor of Philosophy in Botany (Marine) from the University of Hawaii (UH) through an East West Center Study Grant (1968). He was a Graduate Teaching Assistant at the Department of Botany under the advisorship of the late professor Maxwell S. Doty during his five-year stint at UH.

Currently, NS Trono is affiliated with the Food and Agricultural Organization Aquaculture Seaweed Research and Development as technical consultant, where he is actively engaged in the development and generation of scientific knowledge and information in his field of expertise.

Through Malacañang Proclamation Nos. 737, 782, and 783, President Benigno S. Aquino conferred on Academicians Gavino C. Trono Jr., Angel C. Alcala, and Ramon C. Barba, the rank and title of National Scientist in recognition of their scientific contributions to society. In this piece, Darvin S. Rosa writes about them, their careers, their vision and inventiveness which have earned for them the highest recognition given by the President of the Republic of the Philippine to a Filipino man or woman of science.

Angel C. Alcala

THE PHILIPPINES' marine no-take zones, which presently number to more than a thousand and considered as examples of coastal resource management and conservation adopted by many countries, stem from the studies of National Scientist Angel C. Alcala.

His studies led to a national policy and program that established no-take marine protective areas in the country. No-take marine reserves allow the build-up of marine biodiversity including fishery species as well as export of adult fish to areas (outside of marine protected areas or MPAs) used for fishing, thereby enhancing fish yields of fishers.

Aside from marine biodiversity, reef fishes and conservation of MPAs, his other areas of expertise are the systematic, ecology, and diversity of Philippine amphibians and reptiles.

NS Alcala, whose original and significant publications are substantive on both ecological and taxonomic aspects, was an academic leader, institution builder, and public administrator.

As president of Silliman University, he helped institutionalize scientific research on marine biology and marine conservation. Prior to his appointment as university president, he rose from the rank of Instructor in Biology to become Dean of the College of Arts and Sciences, Director of the Marine Laboratory, and finally, President from 1991-1992.

He was also appointed to two important positions in the Fidel V. Ramos Cabinet - as Secretary of the Department of Environment and Natural Resources from 1992 to 1995 and as Chairman of the Commission on Higher Education from 1995 to 1999 – both of which he served with probity, integrity, and transparency.

His expertise have earned for him the confidence of his peers even in the international arena, landing him consultancy positions for marine and aquatic projects supported by the United Nations Environment Programme, World Bank, Asian Development Bank, World Bank Global Environment Facility, the Pew Fellowship in Marine Conservation, and the University of the Philippines Marine Science Institute.

Among the distinctive awards NS Alcala received are the Gregorio Y. Zara Medal for Basic Science by the Philippine Association for the Advancement of Science, Inc. (PhilAAS) (2011), Outstanding Men and Women of Science by the Department of Science and Technology (2009), and Ramon Magsaysay Award for Public Service (1992).

He obtained his B.S. in Biology *magna cum laude* from Silliman University in 1951 and his M.A. and Ph.D. in Biological Sciences from Stanford University in 1960 and 1966, respectively. NS Alcala also received honorary doctorates from Xavier University and University of Southeastern Philippines.

Currently, NS Alcala is Chairman of the Board of Advisers at the Silliman University Angelo King Center for Research and Environmental Management in Dumaguete City. He is also Professor Emeritus at the said university and is a member of the NAST Executive Council.

Ramon C. Barba

BECAUSE OF National Scientist Ramon C. Barba's pioneering work, the flowering and fruiting period of mango trees in the entire country is not merely limited to the period between March to April but now extends to include the entire year.

His specialization in plant physiology, focusing on induction of flowering of mango and on micropropagation of important crop species, has made this possible.

The regularity of mango production is the key ingredient in the development of mango exports which gave rise to an entirely new industry of processed mango products. NS Barba developed the plant growth enhancer FLUSH, which accelerates the growth cycle of the trees and advance their flowering and fruiting stages, to assure continuous fruit bearing of mango trees. The discovery assured regular or controlled flowering of mango trees in many dry areas like Cebu and Guimaras. Furthermore, this technology has been successfully applied on other fruit trees as well including cashew.

NS Barba's groundbreaking technology has found its way to foreign shores, with mango producing countries in Latin America, Africa, Asia and Australia adopting it for their own mango production ventures. It has been patented not only in the Philippines but also in other countries, such as USA, England, Australia and New Zealand. However, NS Barba did not collect any royalty from the patent so that ordinary farmers can freely use the technology.

Meanwhile, his outstanding works on plant micropropagation led to major changes in the production schemes of several important crops.

First of all, he and his team at the Institute of Plant Breeding developed tissue culture protocols for various crops in order to produce large quantities of planting materials that are robust and disease-free.

One of these is banana. The tissue culture protocol his group developed for bananas brought about a major shift in the production system and has become the standard practice in large farms in the Philippines and other countries. It also allowed for annual replanting of banana trees.

Another is sugar cane. Tissue culture of sugar cane has become an integral part of sugar cane agriculture worldwide. The tissue culture protocol NS Alcala's team created has become the standard practice in disease cleaning of sugar cane varieties.

In addition, they developed micropropagation protocols for more than 40 important species of ornamental, fruit, and plantation crops, aquarium plants, and forest trees including cassava, white potato, rattan, bamboo, ramie, derris, garlic, and shallot. He also did innovative methodologies in solving problems of major importance using simple tools.

NS Barba completed his B.S. in Agriculture at the University of the Philippines College of Agriculture in 1958, where he later served as Assistant Instructor from 1958 to 1960 in the Department of Agronomy, Fruit Crops Section. He pursued his graduate studies in the U.S., from 1960 to 1962 at the University of Georgia for his M.Sc. degree in Horticulture, and from 1962 to 1964 at the University of Hawaii with an East-West Center grant. He finished his Ph.D. in Horticulture in 1967.

Upon his return to the Philippines, NS Barba was appointed Assistant Professor in 1969, resigned in 1975, and re-appointed as Professor I in 1981. The Founding Director of the Institute of Plant Breeding (IPB) and 17th President of the University of the Philippines, Dr. Emil Q. Javier, invited Dr. Barba to initiate and develop the Tissue Culture Laboratory, now the Plant Cell and Tissue Culture Laboratory, and the Tissue Culture Program of IPB, College of Agriculture, University of the Philippines Los Baños and became its first Program Leader from 1975 to the late 1980s (without compensation). He continues to serve IPB as Senior Consultant up to the present.

He held significant positions in different private institutions such as: Consultant, Quimara Farms on Mango Production (1969-1985) and Project Director of CORE Foundation (1984-1988). He was also part-time Director of Research at Plantek, a biotechnology company in Singapore partly owned by Tata of India and Sumitomo of Japan from 1985 to 1988.

He received numerous awards, such as The Outstanding Young Men (TOYM) of the Philippines for Agriculture by the Philippine Jaycees (1974), Rizal Pro Patria Presidential Award for Tissue Culture (1980), the Most Distinguished Alumni Award, University of the Philippines (2004), and the SEARCA-Dioscoro L. Umali Achievement Award in Agricultural Development (2011), among others.

ROSA

Are emotions for robots possible? *No? Think again.*

ROBOTS WERE once a dream, an imagination of a nation whose aspiration is to create something extraordinary. A lot of animated robots have already been made. One example is ASTRO BOY, a robot created by a brilliant scientist as a substitute for his son killed in a traffic accident. Originally, it was created in 1951 by Osamu Tezuka, a Japanese cartoonist and animator. It was a comic book series later adapted into different TV series and movies around the world.

In the story, ASTRO BOY's identity is a young robot boy who has a soul, a conscience and human emotion. ASTRO BOY showed big impact around the world and this child-like robot with a soul continues to inspire new generations of robot makers around the world.

One of them is Softbank Corp., a giant Japanese telecommunications company. Last June, Softbank unveiled a new humanoid robot named Pepper in Japan, claiming that Pepper is the first robot who can identify human emotions and respond back to its user's mood.

Pepper is a 4 feet tall machine weighing 62 pounds. It has fully articulated arms and hands with no legs. Instead, it has a sleek base with rollers for its movement. There is also a tablet-like display mounted on its chest for communication.

The machine uses an "emotional engine," gets feedback from its user via facial-recognition technology and a cloud-based artificial intelligence system which stores data that will allow it to analyze gestures, expressions and voice tones taken from cameras, audio recorders and sensors in Pepper's head and body. It will learn how to behave over time, claims Softbank. The company sees a future when robots are household fixtures, doing tasks like taking care of the sick and the elderly.

During the launch, Pepper, which is also programmed to speak 17 languages, offered the traditional Japanese bow to the crowd and was able to chat, shake hands and make people smile.

It was developed and built jointly by Softbank and Aldebaran Robotics, which designs, produces and sells other autonomous humanoid robots.

Pepper will go on sale to the public next year with a market value of $2000. It has been said that Softbank deployed prototypes at two of their stores but they plan to subsequently station Pepper to more stores nationwide to allow customers to interact with the machine. As of presstime, there is still no word if Pepper will be available for sale outside Japan. *(By Ma. Lotuslei P. Dimagiba with CNN report)*

SOURCE: http://www.cnn.com/2014/06/06/tech/innovation/pepper-robot-emotions/index.html

Breakthrough Prize honors mathematicians

A BRITISH mathematician from the Institute of Advance Studies in Princeton, New Jersey, who helped develop techniques for solving long existing math problems, is among the first batch of winners of the Breakthrough Prize in Mathematics.

The recognition, considered as the "biggest science awards in the world" with a $3M prize money for each awardee, is bestowed on individuals for their recent achievements in fundamental physics, life sciences, and mathematics.

For Professor Richard Taylor who specializes in number theory, awards such as the Breakthrough Prize help lure "the best brains into science."

"Science has an undeserved reputation of being dry and unglamorous so anything that can be done to change that image is to be welcomed," Taylor told BBC News.

The roster of winners for the first Breakthrough Prize also include Simon Donaldson of Imperial College London, Maxim Kontsevich of the Institut des Hautes Études Scientifiques in France, Jacob Lurie from Harvard University, and Terence Tao of the University of California. They were nominated by their fellow members in the math community.

"Mathematics is essential for driving human progress and innovation in this century. This year's Breakthrough Prize winners have made huge contributions to the field and we're excited to celebrate their efforts," said Facebook CEO Mark Zuckerberg, one of the founders of the Breakthrough Prize.

The others are Alibaba Group's Jack Ma, Google Co-founder Sergey Brin, Yuri Milner of Digital Sky Technologies and other technology giants.

Referring to Albert Einstein, Milner said, "His name was synonymous with genius. Yet most of today's top scientists - despite opening new windows onto the Universe, curing intractable diseases and extending human life - are unknown to the general public. The greatest thinkers of our age should be superstars, like the geniuses of screen and stadium."

Trophies and their cash prizes will be handed out to the five winners during the Breakthrough Prize ceremony in November 2014.

Taylor, Donaldson, Kontsevich, Lurie, and Tao will serve on the Breakthrough Prize's Selection Committee for succeeding years. *(By Espie Angelica A. de Leon with BBC report)*

SOURCE: http://www.bbc.com/news/science-environment-27926950

BOOK REVIEW:
"What the dog saw" by Malcolm Gladwell

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

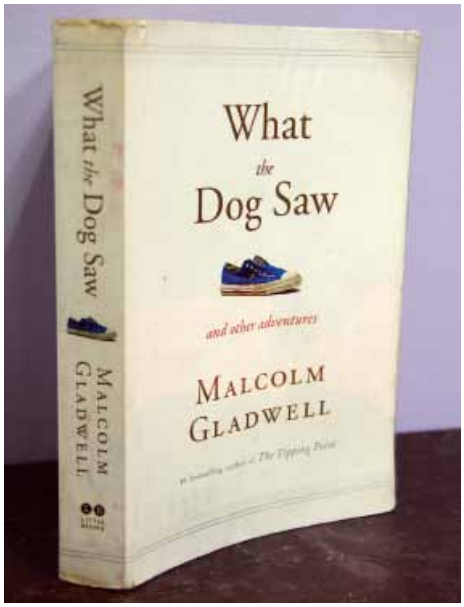
MALCOLM GLADWELL challenges us to question our perceptions in his book "What the Dog Saw," a collection of his essays published in the New Yorker, where he works as staff writer.

One of the articles in the book, originally published on December 13, 2004 entitled "The Picture Problem: Mammography, Air Power, and the Limits of Looking," talks about our normal expectations of pictures, particularly mammograms.

Gladwell argues that mammography as a method to detect breast cancers is not as clear-cut as we want it to be. He derived much of his premise from his interview with Dr. David Dershaw—head of breast imaging at Memorial Sloan-Kettering Cancer Center in New York City.

Dershaw explained to Gladwell that as cancer grows, it produces calcium deposits. Basically, what a radiologist must do is to "look for lumps and bumps and calcium." However, a white speck on the x-rays may mean different things under different circumstances.

In Dershaw's words, "There are certain calcifications in benign tissues that are always benign. There are certain kinds that are always associated with cancer. But those are the ends of the spectrum, and the vast amount of calcium is somewhere in the middle. And making that differentiation, between whether the calcium is acceptable or not, is not clear cut."



Gladwell pushes his point further by citing a study by Joann Elmore, a physician and epidemiologist at the University of Washington Harborview Medical Center. Elmore asked 10 board-certified radiologists to look at 150 mammograms—of which 27 had come from women who developed breast cancer, and 123 from women who were known to be healthy at that time. The radiologists had disparate interpretations of what they saw.

Gladwell also relates the "picture problem" to the military actions done in the past that relied on photographs as basis for aerial bombing targets. Seemingly, the military campaigns were successful at the start. However, after thorough post-evaluation of said campaigns, it was found that the main objectives of the actions were not met. It only shows that the use of highly accurate photographs and of high-tech weapons does not guarantee success.

One of Gladwell's sources, Barry Watts, a former Air Force Colonel who has written extensively about the limitations of high-tech weaponry, puts it: "The issue isn't accuracy. The issue is the quality of targeting information."

Despite showing his readers the limitations of mammograms, Gladwell acknowledges that we are still better off with mammograms than without it.

But perhaps the point that he drives home is that, we must look at the bigger picture--or maybe look beyond the picture for us to make sound decisions, not only in the field of medicine or war, but in our everyday lives as well.

One thing admirable about Malcolm Gladwell is that he lets his stories do the talking. By storytelling, he is able to reveal different facets of a seemingly ordinary event -- in this case, radiologists examining photos from mammograms. As in his other book "Blink," he uses engaging narratives in "What the Dog Saw" to prove a point.

Overall, "The Picture Problem: Mammography, Air Power, and the Limits of Looking" was a great read. Information presented here was easy to digest even by non-doctors and non-scientists like me.

S&T Post welcomes contributions for our Book Review section. Please email your contributions to apcarandang@yahoo.com. Reviews should tackle the book'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.

MOVIE REVIEW:

Transcendence, rising through technology singularity

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

WE ARE witnessing mankind's greatest technologies come to preoccupy our generation's day-to-day living. The exponential growth of the Internet has made this world smaller than ever. Add to this the emergence of social media and we see great potentials that make us turn to technology for solutions. Yet there are also those who have their reservations about technology.

These scenarios make up the plot of "Transcendence" starring Johnny Depp.

The plot picks up from the seminal theory of Technological Singularity. The theory was first used by mathematician John von Neumann in 1958. It refers to the "ever accelerating progress of technology and changes in the mode of human life, which gives the appearance of approaching some essential singularity in the history of the race beyond which human affairs could not continue."

The theory was popularized by Ray Kurzweil – futurist, inventor of the portable reading machine for the blind and Google's current director for engineering. Kurzweil believed that the Theory of Singularity will eventually happen in 2045 when there appears to have an intelligence explosion through the use of exponentially improved technologies that humans at present have never seen before.

In the movie, Dr. Will Caster portrayed by Depp, is a scientist whose expertise is in developing advanced AI. Dr. Caster is part of a team working to create a sentient computer, which he predicts will create a technological singularity, also known as the "Transcendence."

The AI in the movie, called PINN or Physically Independent Neural Network, can recognize everything in its environment. It uses sophisticated quantum processors unmatched by today's supercomputers.

However, what humans inherently possess, the computer locks significantly. AI is not capable of self-awareness. It cannot distinguish right from wrong, and it is unable to express love.

In the middle of the story, Dr. Caster is shot by a member of the Revolutionary Independence From Technology (RIFT) with a radioactive bullet, giving him just a month to live. In his eventual death, Will's wife Evelyn comes up with a plan to upload Will's consciousness into the *quantum computer* which the team has developed.

With Dr. Caster's vast intelligence and funds, he and Evelyn build a high-tech town in the dessert named Brightwood, dedicated to developing groundbreaking technologies on nanotechnology, medicine, energy, and biology.

Many experts fear that supercomputers will take over the human race by combining technology and the human brain, thus exponentially growing in speed and strength. However, Miguel Nicolelis, a Duke University neuroscientist says that "the brain is not computable and no engineering can reproduce it."

Kurzweil's AI concept is designed to analyze the vast quantities of information Google collects and then serve as a super-intelligent personal assistant. However, Nicolelis counters this, saying that mind simply cannot be replicated in silicon because its most important features are the result of unpredictable, nonlinear interactions among billions of cells.

This idea was pointed out twice in the movie, when Dr. Caster's fellow scientist Joseph Tagger played by Morgan Freeman, asked PINN, "Can you prove that you are self-aware?" PINN answered, "That's a difficult question."

In the movie however, it is claimed that if human brains will be uploaded into the system, experts might find the missing link between technology and humans. Yet, the debate between geeks and people advocating to unplug the world, goes head-to-head.

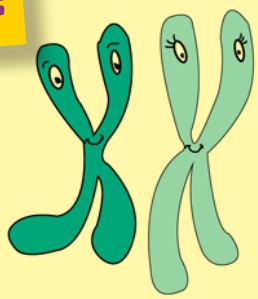
Transcendence is one of those brave movies that consciously attempt to relay concepts that are highly technical in nature and should be discussed academically rather than be presented in a movie. However, it presented a lighter concept to the public, which was probably the reason it was titled "Transcendence" rather than "Singularity.

Although, in the middle of the story, the screenplay may have been lost, unsure whether it was science fiction or a sequel to "X-Men" since much of the plot in the last 25 minutes were overly fantastic. I do not know if viewers understood the movie and its science-laced storylines, because the plot was a bit heavy. Furthermore, if the viewer is not into technology, he would never bother to understand what Technological Singularity means to our present GDP. Even Rotten Tomatoes scored the movie at 19%.

However, Johnny Depp's acting was basically low key but respectable.

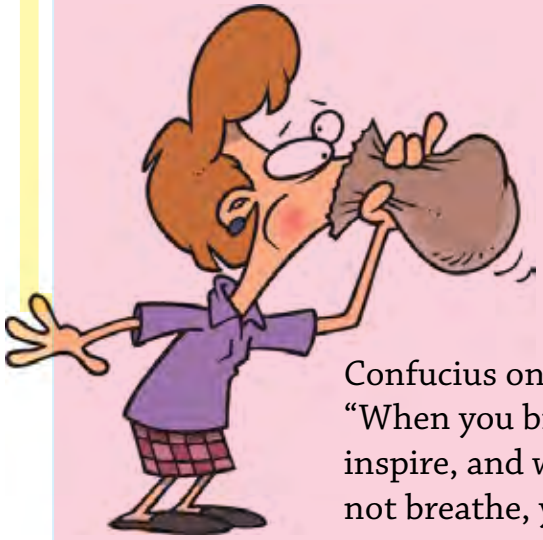
S&T Post welcomes contributions for our Movie Review section. Please email your contributions to apcarandang@yahoo.com. Reviews should tackle the movie's science and technology component, subject to the approval of the Executive Editor. For inquiries, call 837-2191 local 107 and look for Gigi de Leon.

juST for fun!



Q: What is the fastest way to determine the sex of a chromosome?
A: Pull down its genes.

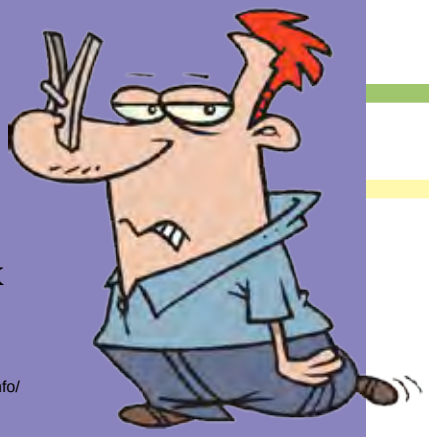
http://www.jupiterscientific.org/sciinfo/jokes/biologyjokes.html



Confucius once said, "When you breathe, you inspire, and when you do not breathe, you expire."

http://www.jupiterscientific.org/sciinfo/jokes/biologyjokes.html

The Official Unabashed Scientific Dictionary defines black holes as what you get in black socks.



http://www.jupiterscientific.org/sciinfo/jokes/astronomyjokes.html

One day after sleeping badly, an anatomist went to his frog laboratory and removed from a cage one frog with white spots on its back. He placed it on a table and drew a line just in front of the frog. "Jump frog, jump!" he shouted. The little critter jumped two feet forward. In his lab book, the anatomist scribbled, "Frog with four legs jumps two feet."

Then, he surgically removed one leg of the frog and repeated the experiment. "Jump, jump!" To which, the frog leaped forward 1.5 feet. He wrote down, "Frog with three legs jumps 1.5 feet."

Next, he removed a second leg. "Jump frog, jump!" The frog managed to jump a foot. He scribbled in his lab book, "Frog with two legs jumps one foot."

Not stopping there, the anatomist removed yet another leg. "Jump, jump!" The poor frog somehow managed to move 0.5 feet forward. The scientist wrote, "Frog with one leg jumps 0.5 feet."

Finally, he eliminated the last leg. "Jump, jump!" he shouted, encouraging forward progress for the frog. But despite all its efforts, the frog could not budge. "Jump frog, jump!" he cried again. It was no use; the frog would not response. The anatomist thought for a while and then wrote in his lab book, "Frog with no legs goes deaf."

Source: http://www.jupiterscientific.org/sciinfo/jokes/biologyjokes.html

It is reported that Copernicus' parents said the following to him at the age of twelve: "Copernicus, young man, when are you going to come to terms with the fact that the world does not revolve around you."

http://www.jupiterscientific.org/sciinfo/jokes/astronomyjokes.html

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

BATAAN NUCLEAR POWER PLANT TOUR. Former Rep. Mark Cojuangco (above, left) explains to the media and science teacher trainees invited by the Department of Science and Technology's Philippine Nuclear Research Institute (DOST-PNRI) the merits and benefits of the Bataan Nuclear Power Plant (above, right) during a tour conducted by the PNRI last May 3, 2014. If operational, the plant is projected to lower electricity costs in the country, luring more foreign investments and making the Philippines more globally competitive. Cojuangco is now lobbying for the rehabilitation and re-opening of the plant. Established during the Marcos administration, the Bataan Nuclear Power Plant completed its hot function testing on May 28, 1984. **(Text and photos by Espie Angelica A. de Leon, S&T Media Service, DOST-STII)**

MOST DISTINGUISHED UP ALUMNUS. Department of Science and Technology (DOST) Secretary Mario G. Montejo is honored as Most Distinguished Alumnus by the University of the Philippines Alumni Association (UPAA) in ceremonies held during the U.P. General Alumni-Faculty Homecoming and Reunion last June 21 at Luciano E. Salazar Hall, UP Diliman. The recognition was part of UPAA's annual Distinguished Alumni Awards conferred on graduates with sterling achievements in their chosen fields that have greatly benefited society. Sec. Montejo, who earned his BSME from UP in 1974. Photo also shows (from left) UPAA President Ponciano Rivera, UP President Alfredo Pascual, and UPAA 1st Vice President Renato Valdecantos. **(Text by Espie Angelica A. de Leon / Photo by Henry A. de Leon, S&T Media Service, DOST-STII)**

RECOGNITION OF RETIRED SCIENTISTS. Eight scientists who retired from government service are awarded plaques of appreciation by the Scientific Career System last June 30, 2014 for their work and significant contributions to research. Among them are (holding trophies) Dr. Aida B. Lapis (Scientist I, DENR-Ecosystems Research and Development Bureau), Dr. Aida B. Solsoloy (Scientist II, DA-Cotton Development Administration - CODA), Dr. Eugenio D. Orpia (Scientist I, DA-CODA), and Dr. Stanley C. Malab (Scientist I, Mariano Marcos State University). Witnessing the awarding ceremony are (2nd row, from left) Acd. Ruben L. Villareal, chairman of Special Technical Committee (STC) on Agricultural Sciences, Civil Service Commission and Scientific Career Council (SCC) Chairman Francisco T. Duque, DOST Undersecretary Fortunato de la Peña, (front row, from left) NAST President and SCC Member William G. Padolina, SCC Executive Secretary Evelyn Mae Tecson-Mendoza, STC Members Dr. Priscilla C. Sanchez, Dr. Venus J. Calilung, Acd. Fabian M. Dayrit, and Dr. Ceferino P. Maala. **(Text by Mary Charlotte O. Fresco, SCC Secretariat)**

NEWLY CONFERRED SCIENTISTS. Ten researchers conferred the scientist rank by the Department of Science and Technology and the Civil Service Commission under the recognition program, Scientific Career System, take their oath on June 30 at Richmonde Hotel in Eastwood, Libis, Quezon City. From left: Norvie Manigbas from PhilRice; Susan May Calumpang from National Crop Protection Center, UPLB; Rosalina Lapitan and Arnel Del Barrio from Philippine Carabao Center; Erloinda Naret from University of the Philippines Visayas (Iloilo); Eufrocina Atabay and Edwin Atabay from Philippine Carabao Center; Edwin Alcantara and Nelly Aggangan from BIOTECH, UPLB; and Arvin Diesmos from National Museum of the Philippines, who was appointed from Scientist II to Scientist III. The Scientific Career System is a system of recruitment, career progression, recognition and reward of scientists in public service, to develop a pool of highly qualified and productive scientific personnel. **(Text by Maria Judith L. Sablan / Photo by Gerardo Palad, S&T Media Service, DOST-STII)**

TANYAG NA ULIRANG AMA 2014. DOST Assistant Secretary and concurrent STII Director and TRC Officer-in-Charge Raymund E. Liboro with his wife Dra. Yasmin Jahala P. Daglugdug-Liboro and children Juan Xanti, Sofia Ysabelle, and Zoie Clarisse, during the ceremony for the Tanyag na Ulirang Ama Award last June 15, 2014 at the Manila Hotel. Organized annually by National Mother's Day and Father's Day Foundation Inc., this recognition is given to fathers who have significant achievements in their respective fields of endeavor while successfully fulfilling their role as head of the family. **(Text by Ma. Luisa S. Lumioan / Photo by Henry A. de Leon, S&T Media Service, DOST-STII)**

ADMISSION IS FREE

2014 NATIONAL SCIENCE & TECHNOLOGY WEEK

July 24-28, 2014,
SMX Convention Center, Mall of Asia, Pasay City

SCIENCE NATION

Philippines: A Science Nation Meeting Global Challenges

exhibits • events • inventions • exhibits • events • inventions • exhibits • events • inventions

REMOTE SENSING
SCIENCE, TECHNOLOGY & INNOVATION
INVENTIONS
GENOMICS
BIOTECHNOLOGY APPLICATIONS
FIBER OPTICS
S&T DISASTER PREPAREDNESS
LiDAR
NOAH

FEATURING:
2014 NATIONAL INVENTION CONTESTS AND EXHIBITS (NICE)

Department of Science and Technology