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Making science work for you

Inside

Marikina receives 20 MOSES tablets from DOST

By JOY M. LAZCANO AND YANNIE 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.

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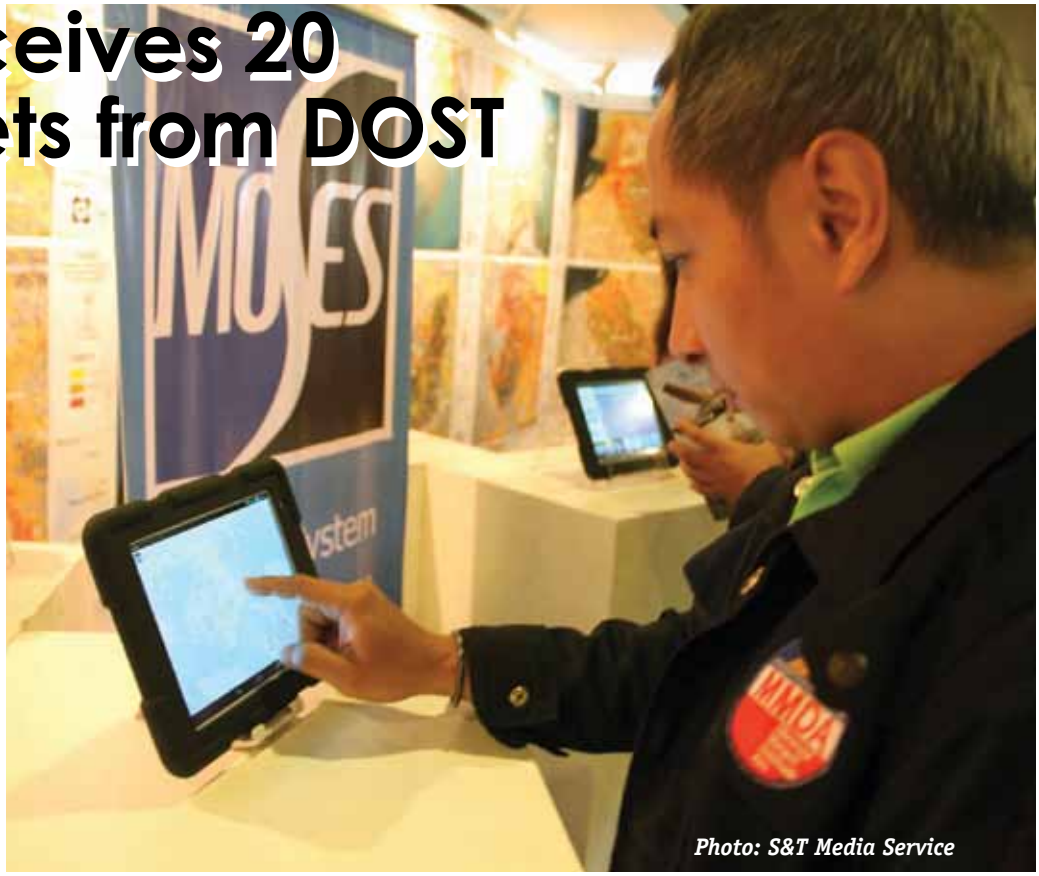

MOSES tablet

Champions! The Team from Philippine Science High School – Central Luzon Campus composed of Jan Louise Cabrera, Joshua Miguel Danac and mentor Karizz Anne Morante bagged medals, certificates, a cash prize of P90,000, and scholarship grants for their project "Bentonite Absorbent as a Technological Improvement of Sapangbato Waters" during Hyundai New Thinkers Spotlight recently held at the Hyundai Center for Green Innovation in Angat, Bulacan.

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

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

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

As climate change causes water scarcity and contamination in most communities in the country, students from Philippine Science High School – Central Campus 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 adsorbent 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.

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Metals industry gets additional boost from DOST

By JOY M. LAZCANO
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. *(S&T Media Service)*

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 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. *(S&T Media Service)*

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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. *(S&T Media Service)*

"Organs-on-chips" to revolutionize drug development

By LOUIE 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.

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.

Dr. Danilo Tagle, associate director for special initiatives of 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. *(S&T Media Service)*

Pisay Central's ...
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Students from PSHS Central Campus, Emilio Bernabe HS, Kasarinlan HS, PSHS – Main Campus, Sisters of Mary School, Marcelo H. Del Pilar National HS, Pateros National HS, Claro M. Recto Information and Communication Technology HS, Mariveles National HS, and Valenzuela City Science HS comprised the firs-ever batch of

"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. "With our project, we are able to make use of available resource such as Bentonite to provide a means in bringing clean water to the Aeta communities in Sapangbato."

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 aimed to develop students into future climate scientists and leaders.

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.

Completing the top 10 are 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 (H20 FLOOD).

HARI Foundation President Ma. Fe Perez-Agudo congratulated the participants and encouraged them to be leaders in whichever field they choose. "We stand here with a dream to drive a new world of possibilities for our young people, the leaders and innovators of tomorrow," said Agudo.

She also urged the Hyundai New Thinkers to be "part of the solution" as the answers could already be in front of them."You are more than brilliant scholars. You are a spark of hope for a better world," disclosed Agudo.

Dr. Josette Biyo, the new director of DOST-SEI, urged the students to continue to exemplify leadership in their own schools and communities even after the HNTC Program.

"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," Biyo said as she encouraged the participants to choose science courses in college.

DOST, IBM partner for Intelligence Operations Center for emergency management

By GRACIELA SALES
S&T Media Service, *DOST-STII*

The Department of Science and Technology's (DOST) latest addition to its disaster preparedness and response initiatives—the Intelligent Operations Center (IOC) for emergency management-- was formally unveiled during the final leg of the Iba na ang Panahon: Science for Safer Communities.

A grant from IBM, the 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 with the DOST and across various government agencies.

The IOC will provide emergency managers 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.

"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 in a statement.

"IBM is honored to be an enabler in building smarter and safer Philippines," said Mariels Almeda Winhoffer, President and Country General Manager of IBM during the formal turnover held Thursday. ***(Graciela Sales, S&T Media Service)***

Mariels Almeda Winhoffer, president and country general manager of IBM Philippines, formally turns over to Department of Science and Technology Secretary Mario G. Montejo IBM's Intelligent Operations Center for emergency management during the NCR leg of DOST's Iba na ang Panahon: Science for Safer Communities info campaign. The Center will provide a central of command for disaster management to help the Philippine government better manage ongoing and future disaster response and recovery efforts. ***(S&T Media Service)***

INFOCUS

BATAAN NUCLEAR POWER PLANT TOUR. Former Rep. Mark Cojuangco **(A)** 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 **(B)** during a tour conducted by the PNRI recently. Photo shows **(C)** tour of participants at the plant's control room. If operational, the plant is projected to lower electricity costs in the country, thus allowing more foreign investments and making the Philippines more globally competitive and economically advanced. The tour also included a visit to the Nuclear Power Village where plant workers used to live prior to its shutdown in 1986. Like the nuclear plant, the village remains in good shape despite the typhoons, earthquakes and other calamities which hit the country in the last 30 years. 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 Angelica A. de Leon, S&T Media Service, DOST-STII)*