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DOST STRATEGY FRAMEWORK



Tales of the 4 Pillars



Just like a well-built house capable of withstanding a super typhoon or earthquake, the Department of Science and Technology has, for years, been standing on a strong foundation using science, technology, and innovation (STI) to provide practical solutions to everyday problems of the Filipinos.

In this issue of the Post, tales from the different agencies and regional offices of the DOST unfold; anchored on the four pillars or strategies: Human well-being, Wealth creation, Wealth protection, and Sustainability.

The stories embedded here are narratives showing how STI has become a game changer, empowering individuals, and enabling communities to become stronger and resilient amid challenges.

On human well-being, a group of residents in Siquijor now have 24-hour access to water while technology paved the way to address arsenic contamination in drinking water for residents of Agoncillo in Batangas. The story of DOST's ReDMatch highlights solutions on childhood stunting, pediatric dengue, and postpartum depression.

In the area of wealth creation, you will find inspiration in the story of a group of women entrepreneurs in Camiguin

as they scaled up their cacao processing venture and find out how DOST consultancy service helped Bukidnon pineapple jam producer earn their FDA certification. Likewise, a women's group in Sarangani Island has their own tale of creating homemade coconut-based products to augment their income.

The Post also carries stories on how STI became instruments for wealth protection with DOST-PHIVOLCS' GeoRiskPH that strengthens disaster risk capability in Ilocos Region. Feed your curiosity with the story of how a university was able to introduce foam innovation to clean up oil spill, thus ensuring the health of life below water.

Looking beyond the now, DOST focuses on sustainability for the future with amazing stories: S&T Fellows to create innovative solutions; development of artificial intelligence and imaging technology to determine the ripeness of durian; the wastewater treatment technology called MEDDOW to promote sustainable ecotourism in Romblon; and the challenge that confronted the tech start-up for the drone-enabled seed dispersal project in Mt. Kalatungan in Bukidnon.

Surely, these stories are made to inform and educate, and serves a unique purpose; to encourage our readers to be more creative, more passionate, and more engaged to use science, technology, and innovation to make lives better than best.

RODOLFO P. DE GUZMAN
Editor-in-Chief

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WEALTH CREATION

Strategy Framework

Solo parents acquire knowledge on soap making through DOST Region I's Women's Month livelihood training

By Sheeren Joy N. Engada

In celebration of the 2023 Women's Month with the theme of "WE for Gender Equality and Inclusive Society," the Department of Science and Technology Region 1 (DOST-I) through the Provincial Science and Technology Office–Ilocos Norte (PSTO–IN) conducted a livelihood training on soap making for solo/single parents in the City of Batac on 21 March 2023, held at the Senior Citizens' Building, City of Batac.

In accordance with Sustainable Development Goal (SDG) No. 1, "Eradicate extreme poverty for all people everywhere," and SDG No. 5, "Achieve gender equality and empower all women and girls," DOST-I—in partnership with the City Social Welfare and Development Office of Batac—provided opportunities for the solo parents from the City of Batac to acquire livelihood skills and apply them in practical ways that are responsive to their individual and community needs. The training aimed to increase employment, fight inequality and poverty, and impart knowledge, upgrade abilities, and procedures for making soap.

Agnes Asuncion of Agnes Farm served as the resource speaker for the training. She acknowledged that she was a single



parent and understood how challenging it was to provide for her family. Thus, equipped with her knowledge and skills, she taught the Batac single parents how to make bath soap and liquid washing solutions. Asuncion hopes the participants will use their skills to earn additional income and help extend assistance to more single or solo parents who are struggling financially.

The program was attended by 27 chosen solo parents from each *barangay*. The

speaker discussed the procedures and directions in making soap. They were then divided into three groups for the practical task. After learning the techniques and putting them into practice, the participants immediately generated their liquid detergents and bath soap.

To conclude the training, Maritess Pascua and the participants expressed gratitude to the trainer and DOST-I for allowing them to acquire technological and livelihood skills.



DOST launches search for regional women social enterprises

Text and photos from DOST-PCIEERD

To celebrate Women's Month, the Department of Science and Technology's Philippine Council for Industry, Energy, and Emerging Technology Research and Development (DOST-PCIEERD) launched Women-Helping-Women Innovating Social Enterprises (WHWise): the Search for Innovative Women Entrepreneurs in the Regions on 31 March 2023.

Themed “Breaking Silos: Empowering Women Social Entrepreneurs through Innovation,” the launch puts in the spotlight the value of women in social entrepreneurship and the importance of partner DOST regional offices (ROs) in implementing the search and tapping their network of women-led social enterprises.

In addition to managing and running the regional competition, DOST ROs will also help in promoting the position by designing and organizing their own call conferences, identifying candidates, assessing pitch submissions, and collaborating with DOST technology business incubators (TBIs) to get candidates ready for the national competition.

DOST-PCIEERD Executive Director Dr. Enrico C. Paringit emphasizes that WHWise is DOST's first initiative to support female entrepreneurs. The Women-Helping-Women program unites an impressive group of female incubator managers and partners to provide a variety of services, including access to technologies, training, skills development, mentorship, and business incubation through the DOST's TBIs.

"Our partnership with the DOST regional offices will expand our reach in providing



With the theme “Breaking Silos: Empowering Women Social Entrepreneurs Through Innovation,” DOST-PCIEERD raised the bar for Women’s Month celebration by launching the search for innovative women social entrepreneurs in the regions.



DOST-PCIEERD Executive Director Dr. Enrico C. Paringit warmly welcomed everyone to the online discussion. In his speech, he highlighted the collaboration and partnership that the initiative would foster between PCIEERD, the regional offices, and the women technopreneurs in their respective areas.

support to women social entrepreneurs, the communities they empower by helping them become innovative through science and technology,” Paringit said.

The following regional offices will be running the WHWise program:

1. Implementing Region: Region I under Dr. Teresita A. Tabaog, Officer in- Charge, Office of the Regional Director
2. Implementing Region: MIMAROPA, under Regional Director Ma. Josefina P. Abilay

Project Title: WHWise: PUSSH WOMEN (Providing Upgrading Support to Social Enterprises, Honing Women for Opportunities Mobilizing them towards Nation-building)

Project Leader: Engr. Jordan Abad

Project Title: WHWise: Innovating Social Enterprises (WHWise) in MIMAROPA
Project Leader: Ms. Jelyn Doctor

3. Implementing Region: DOST-VIII, under Regional Director Engr. Ernesto M. Granada

Project Title: WHWise: Unlad Bay: 2023 Eastern Visayas Search for Innovative Women Enterprises
Project Leader: ARD Marilyn O. Radam

4. Implementing Region: DOST-IX, under Regional Director Martin A. Wee

Project Title: WHWise: Shepherding More Innovative Women-led Enterprises Towards Success (WHWise: Smile to Success)
Project Leader: Regional Director Martine Wee

5. Implementing Region: DOST-X, under Engr. Romela Ratilla, Officer-in-Charge, Office of the Regional Director

Project Title: WHWise: *Babaye* para sa *Babaye*: WHWise Regional Search-Northern Mindanao
Project Leader: Engr. Jonathan Agbayani

6. Implementing Region: DOST-XI, under Regional Director Dr. Anthony C. Sales

Project Title: WHWise Capacity Building of Women-led Enterprises in Region XI in Preparation for the 2023 WHWise National Innovation Challenge: Search for Innovative Women Entrepreneurs in the Regions
Project Leader: Dr. Anthony C. Sales

7. Implementing Region: DOST-CAR, under Regional Director Dr. Nancy A. Bantog

Project Title: WHWise: Search for Women-led Innovative Enterprises in CAR
Project Leader: Dr. Nancy A. Bantog

8. Implementing Region: DOST-NCR, under Regional Director Engr. Romelen, T. Tresvalles,

Project Title: WHWise: Fostering Innovation to Scale-up Technopreneurship Operations of Women Led Social Enterprises
Project Leader: Ms. Jennifer Queddeng

9. Implementing Region: DOST-Caraga, under Regional Director Engr. Noel M. Aioc

Project Title: WHWise: Accelerating Innovation and Inclusive Entrepreneurial Ecosystem for Women in Caraga through WHWise Program
Project Leader: Engr. Emman Lliam L. Prisco

DOST Secretary Dr. Renato U. Solidum Jr. praised the launch as it provides opportunities for women social

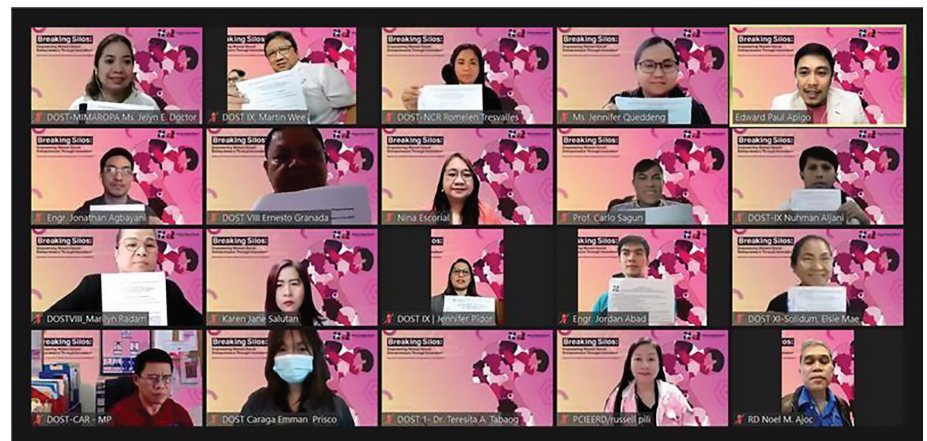
entrepreneurs in the regions that can spur development in the countryside.

“The WHWise Program can help address the barriers that women entrepreneurs face and contribute to a more inclusive and thriving startup ecosystem. It is highly commendable especially with the Regional Offices for answering our call to leave no one behind and ensuring that women entrepreneurs in the regions get the opportunity to showcase their innovative ideas to contribute to the country’s economic growth,” he said.

DOST-PCIEERD launched the WHWise Initiative in 2021 to support women-led social enterprises and serve more communities.



Eduksine founder Karen Jane Salutan (left) spoke about her experiences as a female social entrepreneur and how her project evolved into a renowned business incubator that comes under the DOST TBIs and startups.



Nine DOST Regional Offices (Regions I, MIMAROPA, VIII, IX, X, XI, CAR, NCR, and Caraga) heed the invitation to conduct WHWise: the Search for Innovative Women Entrepreneurs in the Regions. Marking the event was the signing of the Memorandum of Agreement between the Regional Directors, their Officer-in-Charge, the Project Leaders, and DOST-PCIEERD in relation to the project.



Local cross-laminated bamboo, a promising construction material

By Rizalina K. Araral, DOST-FPRDI

Filipino researchers are one step closer to understanding engineered bamboo.

A research team at the Forest Products Research and Development Institute of the Department of Science and Technology (DOST-FPRDI) recently found that cross-laminated board made from local bamboo species is a promising construction material.

Explains Dr. Rico J. Cabangon, DOST-FPRDI Deputy Director and one of the researchers, “Engineered bamboo refers to various kinds of composite boards that come from processing raw bamboo. Several layers of bamboo strips or slats are glued together and pressed to form boards that can be used for specific purposes - furniture, decors, and house parts such as walls, doors, ceilings, and

floors. Engineered bamboo panels are often stronger and less prone to warping than equivalent solid woods.”

One type of engineered bamboo is cross-laminated bamboo or CLB. In a recent study, the DOST-FPRDI researchers measured the strength of CLB made from two local species, *kawayan tinik* (*Bambusa espinosa*) and giant bamboo (*Dendrocalamus asper*).

“We produced CLB by gluing layers of bamboo slats on top of each other, with the grain of adjoining layers running in opposite directions. This type of lamination gives the board strength in two directions,” says Project Leader Christian Camacho. “The results were encouraging: our CLB met the strength requirements of some cross-laminated timber products. Their density, hardness,

and bending strength are promising for load-bearing walls, floors, and ceilings.”

Camacho explains that his inspiration for studying CLB was cross-laminated timber or CLT, an innovative panel currently gaining attention worldwide.

He adds, “With the local housing demand currently at an all-time high, there is space for CLB in the Philippine building industry, especially in prefabricated housing. In the US alone, the demand for prefab houses is expected to reach 145,000 units next year. This makes CLB a potential exportable construction material.”

Made from a fast-growing, renewable resource, CLB can help provide livelihood to local bamboo farmers and other players in the bamboo industry.

DOST eyes Mindanao as the next economic prime mover

By Geraldine Bulaon-Ducusin, DOST-STII

“The Department of Science and Technology (DOST) recognizes the massive potential of Mindanao as a prime mover of socio-economic development,” Dr. Anthony C. Sales, DOST-XI Regional Director said during the Mindanao Regional Scientific Meeting at the Acacia Hotel in Davao City.

This is manifested in DOST’s continuous promotion of the thriving research and development (R&D) ecosystem in Mindanao and by mapping out sound programs, projects, and policies that will aid in the increase of R&D investments and human resources, as well as enhancement of R&D capabilities.

Of late, Mindanao exhibited agricultural advancements in the form of the development of new crop varieties, improved plant nutrition, disease detection and management, and the production of climate-resilient crops, among others.

DOST just completed its 2023 Call Conference, which discussed the agency’s thrusts and priorities in line with the upcoming call for R&D proposals, with the goal of boosting innovation in the Mindanao region.

The DOST Councils such as Philippine Council for Industry, Energy, and Emerging Technology (PCIEERD), Philippine Council for Health Research and Development (PCHRD), Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD), and National Research Council of the Philippines (NRCP) will be accepting proposals aligned with the research areas and priorities of each council until 31 May 2023 as part of DOST’s continuous efforts to create a nurturing environment for the science community and support the national economic agenda.

Among the R&D initiatives in the south is the Mindanao Renewable Energy Center in Ateneo de Davao University, which aims to catalyze and support the conduct of R&D on renewable energy technologies to reinforce energy policy, as well as utilization and commercialization of technologies. This is highly relevant, especially with the foreseen increase in energy requirement in Mindanao.

Other Mindanao projects are the Center for Applied Modeling, Data Analytics, and Bioinformatics for Decision Support Systems in Health led by the University of Philippines Mindanao in collaboration with the Mapua Malayan Colleges Mindanao. There is also the R&D Center for Maternal and Child Health in Mindanao or ReDMatCH at the Davao Medical School Foundation, Inc., which deals with primary health problems of women and children.

There are also different R&D centers which focus on commodity products that are naturally abundant or proudly produced in Mindanao. Then, there is the Seaweeds R&D Center in MSU Tawi-Tawi, which is poised to strengthen the R&D for one of the most common and important resource in the southernmost province of Mindanao.

Despite the strides in R&D, however, funding and procurement remains to be a problem, as raised by some scientists in the forum.

“Tanggapin natin ng maliit ang funding, mahirap kumuha ng funds. Kung makakuha ka man ng funds, ang hirap gumastos,” Fernando P. Siringan, a professor at the University of the Philippines, Marine Science Institute and an Academician of the National Academy of Science and Technology (NAST), said.

Siringan cited his experience at the University, wherein the project is already

running for one year, yet the things needed weren’t yet procured.

Siringan said that, in many occasions, even on television, they have already raised their concerns on these issues on funding and procurement. He hopes that the representatives in Congress and at the Department of Budget and Management will address these problems.

“Kasi ay nakakapilay talaga sya sa research, at iyong procurement process natin na sana ay makakuha tayo ng maganda at mura ay hindi naman talaga ganoon ang nangyayari. Ang nakukuha natin yung madaling masira at mahal,” Siringan added.

Siringan appealed “(And) we share the pain and the difficulties of doing research work in this country. Pero iyong appeal, ang lahat ay pwedeng magsalita, ‘wag lang i-asa sa NAST or DOST although they are probably in the best position to do it. But everybody can voice those concerns, sa mga kakilala natin na pwedeng magpa-akyat nung problema na iyon sa national government.”

Despite some shortcomings at the national level, Mindanao succeeded in integrating its R&D efforts towards inclusive growth, and closely engage their stakeholders from the academe, industry, government, civil society organization, and the media to keep their approaches aligned with various frameworks, including the global sustainable development goals set by the United Nations and the Philippine Development Plan geared towards Ambisyon 2040 of embracing the mission to enable and empower every Filipino to achieve their ambition.



The STI Forum 2023 was held at the UN Headquarters in New York, USA on 3-4 May 2023. (Photo courtesy of Philippine Permanent Mission to the UN in New York)



DOST Secretary Renato U. Solidum Jr. delivers the Philippine Statement at the Eighth Annual Multi-Stakeholder Forum on Science, Technology, and Innovation (STI) for the Sustainable Development Goals (SDGs) Ministerial Session. (Photo courtesy of Philippine Permanent Mission to the UN in New York)

Addressing UN scientific international community: DOST Secretary shares how PH helps MSMEs, startups, researchers, and communities through STI

By Karen Lou S. Mabagos, *DOST-ITCU*

On 03 May 2023 at the United Nations (UN) Headquarters in New York, Department of Science and Technology (DOST) Secretary, Dr. Renato U. Solidum Jr. addresses the various delegations at the Eighth Annual Multi-Stakeholder Forum on Science, Technology, and Innovation (STI) for the Sustainable Development Goals (SDGs) to showcase how the Philippines, through the DOST, creates a conducive STI ecosystem.

“The Philippines firmly believes that science, technology, and innovation hold limitless potential in finding solutions to address pressing issues that affect both local and global communities”, Secretary Solidum said during the Ministerial Session on

Innovating to deliver on the SDGs. However, the DOST Secretary mentioned, there are still barriers to overcome to fully maximize the benefits of STI such as the rising inequality within and among nations.

According to Secretary Solidum, to level the playing field and respond to the need to adapt to the rapid pace of technological development, the DOST provides technical, technological, and financial assistance to small players in the industry. This includes micro-, small-, and medium-sized enterprises (MSMEs) for which the DOST implements a program called the Small Enterprise Technology Upgrading Program or SETUP, now helping entrepreneurs transition to Industry 4.0 technologies.

The science chief also said that another program encourages and supports innovative incubators in the country through the Technology Business Incubation (TBI) program. The DOST also reaches out to communities through the Community Empowerment through Science and Technology or CEST and grants funding to researchers through the DOST Science for Change Program, as well as through DOST Grants-In-Aid Program.

The S&T Secretary further explains that the Philippines’ DOST contributes to the current priority SDGs through its initiatives. Some examples were using geospatial technologies and data for maps and modeling systems to monitor water bodies (SDG 6), solar photovoltaic (PV) technologies for electricity in remote areas and rural health units (SDG 7), R&D programs to advance industry, innovation, and infrastructure

(SDG 9), and the Smart and Sustainable Communities Program or SMART Program (SDG 11).

In closing, Secretary Solidum said, “the Philippines calls for strengthened partnerships among member States, the United Nations and other stakeholders to develop joint STI initiatives that will have a more significant impact for the benefit of all.”

Also called the “STI Forum,” the annual event’s official sessions were held for two days on 3-4 May 2023, gathering all relevant stakeholders across different countries to discuss STI initiatives in line with the 2030 Agenda for Sustainable Development. The outcome of the Forum will feed into the United Nations High-Level Political Forum on Sustainable Development that will be held from 10-19 July 2023 and in the mid-term review of the SDG progress in September 2023.



Courtesy call of the Philippine Delegation on Amb. Antonio Manuel R. Lagdameo and officials of the Philippine Permanent Mission to the UN in New York. L-R: Ambassador and Second Deputy Permanent Representative Hon. Leila C. Lora-Santos; DOH Director Frances Rose Mamaril; DOST Secretary Renato U. Solidum Jr.; DOH Undersecretary for Special Concerns Francia Laxamana; Ambassador Extraordinary and Plenipotentiary & Permanent Representative H.E. Antonio Manuel R. Lagdameo; and Ambassador and Deputy Permanent Representative Hon. Ariel R. Penaranda. (Photo courtesy of DOH Philippines).



Researchers urge exploration of PH hot springs and volcanic microorganisms for biotech and pharma applications

By Geraldine Bulaon-Ducusin, *DOST-STII*

The researchers suggest further microbial and natural product (NP) exploration of volcanoes and hot springs—underexplored habitats that will undoubtedly yield a huge repertoire of novel and biologically active compounds.

Microbial and natural products (NPs) have been prominent sources of drugs for a long history, especially for cancer

and infectious diseases and hot springs and volcanic environments represent valuable sources of novel NPs, yet largely untapped and understudied.

Given this, a study on “Bioactive Compounds from Hot Spring and Volcanic Microorganisms” was conducted by a research team from the University of the Philippines Cebu and Adamson University.

There are almost 400 volcanoes located all over the country according to the Philippine Institute of Volcanology and Seismology, about 25 of which are considered active, and the Philippines is also endowed with many natural hot springs.

The study by the team of Dr. Fleurdeliz Maglangit surveyed the bioactive NPs from hot springs and volcanic microbes from 2006–2022, highlighting their chemical structures and biological potential.

“Microbial pathogens or microorganisms that are capable of producing diseases quickly evolve new ways to combat drug therapy more rapidly than the introduction of new drugs and drug candidates to the clinical pipeline. That’s why new sources of biologically active compounds effective against drug resistant cells are urgently needed,” Dr. Maglangit said, one of the researchers.



Collection of soil and water samples in Mainit Hot Springs in Brgy. Montaña, Malabuyoc, Cebu

The threat of antimicrobial resistance (AMR) and superbugs, which are microbial strains that have become resistant to the drugs used to treat them, have continued to rise relentlessly, rendering the current antibiotics and drugs ineffective for common infections.

AMR is considered the next silent pandemic. According to the World Health Organization, AMR is one of the top 10 biggest threats of the century, causing nearly five million deaths annually and over 1.2 million deaths directly attributed to AMR.

“Hot springs and volcanic environments have been shown to harbor high microbial biodiversity with unique metabolic profiles, yet they remained untapped and understudied for their production of novel druggable chemical entities,” Dr. Maglangit said.

The NPs isolated from hot springs and volcanic microbes represent structural diversity and novelty in comparison to the NPs isolated from terrestrial or marine habitats. The hot spring water temperatures provide favorable conditions for thermophilic microbes to generate a wide array of bioactive metabolites.

Hot springs, also called thermal springs, are springs with water temperatures above their surroundings. They are produced by geothermally heated groundwater, which is warmed either by shallow intrusions of molten rock in volcanic areas or by circulation through faults to hot rock deep in the Earth’s crust.

Hot springs are inhabited by heat-loving microorganisms or thermophiles that can thrive at high temperatures. The diversity of these organisms has been mainly attributed to temperature. Other factors include pH, dissolved hydrogen sulfide levels, biogeography, and geological history.

Thermophiles have attracted significant interest in recent years for their production of heat-stable enzymes for biotechnological applications—including industrial, agriculture, and medical processes.

Maglangit’s team recommended the conduct of more extensive experiments, whether in animal models or human subjects, since some of the compounds that have been identified from hot springs and volcanic microbes have only been tested *in vitro*.

Hot springs have been shown to host a wide variety of heat-tolerating or thermophilic microorganisms, and among these are the hot springs in Mt. Makiling, Los Baños, Laguna, as well as the Wonder Lake hot springs, also in Laguna, and the two hot springs in Benguet –Badekbek and Dalupirip.

Incidentally, the same research team is currently involved in a research project with Mainit Hot Springs located in Brgy. Montañeza, Malabuyoc, Cebu as the area of interest. Project ISAAC (Isolation, Screening, and Antimicrobial Activity of Compounds from Actinobacteria) aims to isolate, screen, and characterize thermophilic actinobacteria for the

production of bioactive compounds with the potential for drug development. To date, several thermophilic strains were isolated from Mainit Hot Springs with remarkable bioactivities against Gram-positive pathogens, including *Staphylococcus aureus* and *Bacillus subtilis* compared with gentamicin or oxytetracycline antibiotic control. Isolation and characterization of the bioactive compounds are currently underway in their laboratories.

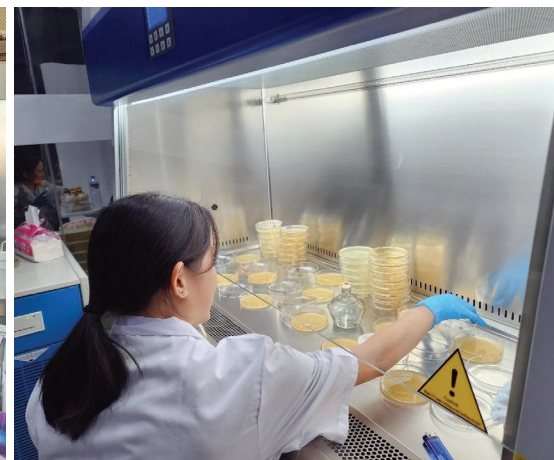
The microbial species and chemical diversity in hot springs and volcanic habitats are indeed indicative of future exploration. These novel microorganisms will also likely produce novel druggable molecules.

The research is funded by the Department of Science and Technology–National Research Council of the Philippines (NRCP).

The full report on this research will appear in the Philippine Journal of Science (PJS), the oldest science journal in the country on June 2023 issue. PJS is published by the Department of Science and Technology–Science and Technology Information Institute.



DNA extraction from thermophilic bacteria



Isolation of thermophilic bacteria from environmental samples

PH MSMEs need help in metrology, experts say

By Geraldine Bulaon-Ducusin, DOST-STII

“MSMEs need help in metrology to ensure food safety.”

This is what Kiveen P. Suycano, a research specialist at the Industrial Technology and Development Institute (ITDI) of the Department of Science and Technology (DOST) said in his presentation during the celebration of the National Metrology Laboratory’s (NML) 2023 Metrology Day, themed “Underpinning the Role of Metrology in Food Quality and Safety.”

Suycano underscores the importance of metrology or the science of measurements and its applications—not only in big industries, but even in the Micro, Small, Medium Enterprises.

“We need to make more effort to help, especially the MSMEs *kasi sila po iyong sa tingin ko po ay mas higit na nangangailangan ng tulong para mas mapabuti*, for them to innovate and somehow improve their processes *para maiwasan natin ang* food loss and food waste,” Suycano urged.

Through metrology, the quality and authenticity of food are determined by measuring its chemical composition microbial load. The safety of food is ensured by careful measurement to detect the presence of chemical and microbiological contamination such as pesticide residues, heavy metals, mycotoxins, and pathogens.

Metrology can help businesses innovate, do better, perform better, and improve the quality of their products, and make them compliant to the quality of international and national standards. And

these will lead to job creation and better income for the Filipinos.

This year’s theme for Metrology Day “Measurements Supporting the Global Food System,” was chosen because of the effects of the increasing challenges of climate change and increasing population and the global food production and distribution systems, as well as food security.

Access to safe and nutritious food is a basic human need and is probably one of the most pressing needs, such that the United Nations in its sustainable development goals listed zero hunger as almost at the top of the list for the pandemic because it was estimated that between 720 and 800 million persons worldwide were suffering from hunger. It was roughly 161 million more than in 2019, and the pandemic further aggravated this situation.

“The need for a reliable food providers and regulators, and sufficient food

system is a pressing worldwide issue in which metrology plays a key role,” Annabelle V. Briones, Director of DOST-ITDI said.

In food safety, there is what they call a food chain approach and DOST-ITDI’s NML helps ensure the implementation of the Republic Act No. 10611 of 2013 or “An Act to strengthen the Food Safety Regulatory System in the Country to Protect Consumer Health and Facilitate Market Access of local foods and food products, and for other purposes”.

“Our food safety act enables our country to have a mechanism so that our food providers will have a capability to monitor, regulate, and ensure that the food served, whether it be packaged food, or food we serve in our restaurants, or even in our *sari-sari* store are safe for consumption, to prevent illness or disease,” Admer Rey C. Dablio, also a science researcher of DOST-ITDI, said.



(Photo grabbed from Zoom presentation of Kiveen P. Suycano, a research specialist at DOST-ITDI) Metrology intervention in food processing includes weights of raw materials and ingredients, temperature, food labels (nutriton facts and net weight), and food additives.

The food chain approach entails food production, transport and processing, retail and storage, preparation, and consumption. And metrology is present in all of these.

“In food processing, it’s not just about *matimbang mo, o ma-process mo, kailangan* metrology would still be there for you to establish food safety, and of course *ma-lessen* yung food losses, and another one is food waste. *Kailangan* appropriate *iyong* pressure, otherwise, yung mga bote, like the bottle of sardines, *pwede sya sumabog*. *Yung mga lata*, if not calibrated yung canning machine natin, wherein the force is too much, *maaaring mayupi ang lata* and somehow that would reflect failure when we go to quality control,” Suycano illustrated the use metrology or measurements in food processing.

Accurate and reliable measurements support the global food system by ensuring that the correct amount of food is produced, transported and sold. There will be reduction (or elimination) of food loss and food waste during production, processing, distribution, and consumption. Fair trade is promoted through accurate measurements, which in turn ensures food quality and safety in compliance with regulatory requirements, not only in the local standards, but in the international standards as well.



(Photo grabbed from Zoom presentation of Kiveen P. Suycano, a research specialist at DOST-ITDI) By determining the PH level of the soil, the farmers can now analyze and determine how fertilizer to use to maximize their efforts and also determine the specific type of variety to plant on a specific location, depending on the type of soil, so that they can get have an optimum harvest.



(Photo grabbed from Zoom presentation of Kiveen P. Suycano, a research specialist at DOST-ITDI) In livestock, it is important to measure appropriate temperature and humidity. For instance, in the case of poultry, if the temperature is appropriate, there’s a greater chance that the chickens will lay more eggs. Volume metric devices for livestock farmers are needed to monitor the weight of their livestock and ration of feeds that they have to give.

DOST's SETUP helps Camiguin woman entrepreneur scale up cacao processing venture

By Efraem O. Egoc, DOST-X



Employees of Mama Jita's Food Products during their production of the firm's famous tablea, a chocolate bar from native cacao beans.

The Department of Science and Technology (DOST)'s banner program, Small Enterprise Technology Program (SETUP) helps Camiguin-based woman entrepreneur and farmer, Julieta Butalid—dela Cerna, scale up her cacao processing venture through science, technology, and innovation.

DOST's intervention brought about a remarkable transformation for the business, achieving a 20% boost in productivity, a solid 25% increase in sales, and successfully reducing rejects from 40 to 35%. Additionally, the intervention led to the creation of two direct and three indirect jobs, boosting the local economy.

In 2021, the firm was able to acquire food-grade equipment with better specifications through SETUP. Among the equipment availed are roaster machine, a cacao colloid mill, an industrial multipurpose cacao cracker/dehuller winnower, and more.

"Eto ang pinakamalaki na tulong sa akin kase may grace period one year at saka three years to pay so hindi mabigat sa pagbayad", dela Cerna said. (This is the biggest help because of the one-year grace period and the three-year payment fulfillment; hence, it is not heavy to pay).



DOST Secretary Renato U. Solidum Jr. and DOST Undersecretary for Regional Operations Sancho A. Maborang with Mama Jita's Food Products Inc owner, Ms. Julieta dela Cerna and DOST-X representatives during the project visit on 12 April 2023.

DOST also provided technological consultancy services to the firm, such as good manufacturing practices and food safety seminar-workshops, smart packaging assistance, halal awareness seminar, MPEX or manufacturing productivity extension, and others.

The agency also provided assistance in the drafting of the firm's sanitation standard operating procedures (SSOP), which was among the major documents needed to acquire license to operate from the Food and Drug Administration. Mama Jita's Food Products acquired LTO in August last year. The LTO certification enabled Mama Jita's Food Products to enter neighboring malls and supermarkets in the region.

The technology upgrading helped the firm catch up with the overwhelming purchase orders from partner *pasalubong* centers, malls, supermarkets, and outlets for their two main products: tablea and tablea choco drink.

During the DOST Secretary's visit in April this year, Secretary Renato U. Solidum Jr asked dela Cerna her aspirations for her business. "*Ang pangarap ko na mas lumago pa* (business), target maka CPR (Certificate of Product Registration) *para maka display sa mga malls at saka (maka export)*" (My dream is for the business to prosper and secure CPR so I can display in malls and export my products).

Mama Jita's Tablea is a chocolate bar for *chamorado* (chocolate porridge) and *sikwate* (hot chocolate drink). Her products, the tablea and the cold chocolate drink, are made from 100% pure, native cacao variety, with strong aroma. It is available to select *pasalubong* centers and malls in Region 10.



DOST Secretary Renato U. Solidum Jr. and DOST Undersecretary for Regional Operations Sancho A. Maborang at the Mama Jita's Food Products Inc's processing facility giving technical consultation for product and facility improvement to owner Ms. Julieta dela Cerna.

SETUP is a nationwide strategy encouraging and assisting micro, small, and medium enterprises to adopt technological innovations to improve their products, services, and operations as well as increase their productivity and competitiveness.

About DOST-10

The Department of Science and Technology – Region 10 (DOST-X) envisions to be an effective and competent catalyst of inclusive development by providing world-class and innovative Science & Technology services in Region 10.

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Pineapple Jam of Paula's Bukidnon Delights

Bukidnon pineapple jam producer earns FDA certification with DOST consultancy

By Goldy Cordero, DOST-X

Mama Nene Homemade Delights, locally known as Paula's Bukidnon Delight, earns its Certificate of Product Registration (CPR) for its pineapple jam, through the consultancy and training services of the Department of Science and Technology.

The CPR is a requirement of the Food and Drug Administration for food products (beverages, water, canned goods, etc.), food supplements, medicines, and others if such products will be exported. It is also a requirement of institutional buyers such as malls and supermarkets. With the newly acquired CPR, this woman-led enterprise can now expand its market reach

and offer its delicious and high-quality pineapple jam throughout the country through various malls, *pasalubong* centers, and others.

Ms. Paula Chiong, the owner, considers this achievement a significant milestone since pineapple jam is the very first product of the business. “I thought *na imposible para sa isa ka micro na negosyante na maka kuha og FDA LTO and CPR* but with the help and guide of DOST *napa sayon and napa dali* and I have proven *na walay impossible basta naay pasencya, pag kugi*, perseverance and determination. *Karon challenges nasad ang atubangon* which is to conquer the Philippine market”. She relayed how DOST has assisted her firm to acquire FDA License to Operate and now her CPR. She also said that with this new milestone, she is ready to face a new challenge: conquering the Philippine market.



Owner Ms. Paula Chiong showcasing her pineapple jam and other products available at their café in Malaybalay City, Bukidnon.



DOST-Bukidnon Provincial Director Ritchie Mae L. Guno during the project monitoring at the facility of Paula's Bukidnon Delights.

The firm first acquired the Small Enterprise Technology Upgrading Program or SETUP. Aside from the technology upgrading they have acquired, they are also a licensee of the Food and Nutrition Research Institute's Enhanced Nutribun Technology. The firm

is also a beneficiary of the Manufacturing Productivity Extension or MPEX Program through the consultancy services of DOST. These programs have helped the company improve its plant layout, food safety, and *halal* training, which can help boost the firm's competitiveness and productivity. The firm was also assisted in its laboratory analysis through the DOST-X Regional Standards and Testing Laboratories.

Ms. Paula is currently producing 1,000 kilograms of pineapple jam every month—an increase of 66% after DOST intervention and has produced seven additional products such as pineapple muffin, pineapple *ensaymada*, Paula's mango jam, Paula's langka, Paula's

vinegar, Paula's vinaigrette, and Paula's Chili Sauce.

Paula's Bukidnon Delights products are now becoming among the most sought-after *pasalubong* products from the province. The firm also caters walk-in visitors of their newly opened café at the Kaamulan Ground, Capitol Compound, Malaybalay City—where their *enutribun* facility is also at.

DOST, Representative Flores ink partnership to launch project on pineapple fiber extraction in Lantapan

By Goldy Cordero, DOST X

The Department of Science and Technology (DOST) and Representative Jonathan Keith Flores of the 2nd Congressional District of Bukidnon inked a Memorandum of Agreement (MOA) for a project on pineapple fiber extraction in Lantapan, Bukidnon. This collaborative project is envisioned to help minimize the waste management costs of the local growers, process quality pineapple fiber, generate employment, and create opportunity for additional income to the beneficiaries.

The Pineapple Fiber Extraction project is a result of technology needs assessment conducted by DOST–Bukidnon with a community in Lantapan. This led to the collaboration of establishing a dedicated facility equipped with specialized machinery. The project involves the processing of 45 tons of pineapple waste. This waste primarily consists of pineapple leaves that are typically discarded after the fruit is harvested. Instead of being treated as waste, the project aims to extract valuable fibers from these pineapple leaves.

The project's target beneficiaries are the 61 livelihood members of the cooperative and local pineapple growers in Lantapan,



Representative Jonathan Keith Flores, DOST–Bukidnon led by Provincial Director Ritchie Mae L. Guno together with the livelihood members of the pineapple growers in Lantapan, Bukidnon during the signing of the MOA (02 May 2023).

Bukidnon. These individuals will directly benefit from the initiatives and activities of the project, particularly in terms of income generation.

The extracted fibers may be used in various purposes, such as but not limited to textiles, handicrafts, furnishings, accessories, and eco-friendly packaging materials.

DOST through its Community Empowerment through Science and Technology or CEST program has allocated funding to mobilize capacity building activities and acquire equipment such as a multi fiber decorticating machine, fiber brusher/spindle machine, and hydraulic presser to extract pineapple fiber. Aside from the provision



Source: DOST-6

of technology, DOST will also provide training for fiber extraction, equipment utilization, and maintenance for standard implementation of the extraction process, ensuring that the fibers extracted are of consistent quality.

The MOA signing was conducted in Malaybalay City on 2 May 2023. During the MOA signing, congressman Flores expressed his thanks to DOST for the science and technology-based interventions. *“Atong pagpasalamat sa coordination with DOST kay sila pud ang nag step up nga nag provide ani na makina. I hope na kaning inyung grupo, mao lang ang sugod sa atong mga beneficiaries na matagaan ug access to*

this type of projects in partnership with the DOST *para makita pud sa uban unsa ka successful ang inyung gibuhit hinaot unta ma replicate pud para mas daghan pa na komunidad ang magbenefit ani na programa”*, he said. He emphasized that it’s important for this project to be successful so it can be replicated to other parts of the province and, thus, give benefits to more people.

Also present during the event are the target beneficiaries, Lantapan pineapple growers, DOST–Bukidnon Provincial Director Ritchie Mae L. Guno, and the legislative staff of the Bukidnon Satellite Office of Representative Flores.

This project promotes innovation in the utilization of natural and renewable resources. It aligns with the DOST’s broader goals and CEST Program’s objective in achieving environmental conservation, promoting sustainable development, and addressing the challenges posed by climate change.

DOST-Davao upskills women group in Sarangani island with homemade coconut-based products

DOST XI S&T Information and Promotion



Coconut-based products made during the conduct of the training.

Macaroons, bukayo, and coco jam—these are only a few of the coconut-based products introduced by the Department of Science and Technology Region 11 Office (DOST-XI) through the Provincial Science & Technology Office in Davao Occidental to a women’s organization in Balut Island, Sarangani, Davao Occidental through a series of technology training.

With the aim of uplifting the lives of the families in the countryside through economic opportunities, DOST Davao taught the women on the island by utilizing the uses of coconuts, which are abundantly grown in the area.

A total of 120 women participated in the training. The focus of the training was to empower these women with expertise in transforming coconuts into value-added

products that are delicious, marketable, and nutritious—which was led by the DOST Davao Technology Training personnel, Ms. Robelyn Pulido.

The women’s community was thrilled with the opportunity given to them to generate income by creating high-quality products from resources that are readily available to them.

“Kita nga mga kababaihan, makatabang pud ta sa atoang economy in our little ways (As women, we can also help our economy in our little ways),” said Ms. Maria de Arce, head of the women’s organization.

Aside from the macaroons, bukayo, and coco jam, Ms. Pulido also introduced coco cookies that are made from residues of coconut meat or kernel.

In addition, she assisted the women in basic marketing strategies to ensure a sustainable market for coconut products.

To complete the training, the participants were equipped with knowledge and skills on liquid dishwashing soap, detergent powder, and fabric softener— which can also be valuable alternative sources of income for the community.

“Sa DOST, our heart can’t thank you enough. Unta dili mo magsawa magbalik balik diri sa amoa (I hope you will not get tired of coming back here in our island),” Ms. De Arce said.

The technology training was conducted under the Community Empowerment Through Science and Technology or CEST program aimed at improving the economic conditions of the people by providing various livelihood opportunities.

New cacao farming technique turns an all year round harvest

By Angelo Bagaipo, DOST-VII

“How can you expect a tree to yield large volume of cacao pods if the bud wood used in grafting for the seedling to be planted doesn't yield cacao pods?”

This is what Jack Sandique, a cacao farming expert of Cacao PhilSense, asked the training participants and stakeholders of the Department of Science and Technology Region 7 (DOST-VII) Bohol Provincial Office.

Sandique added that this is the problem that most farmers are not aware of since grafted seedling are either given to them for free or if they bought it, they don't know where they were sourced.

Cacao PhilSense is a group of cacao experts in cacao farming, post-harvest, and cacao bean processing. They are advocates of these new methodology and technique in cacao farming and post-harvest processes.

In traditional farming, a farmer is given grafted cacao seedlings to be planted. Most of them do not even know where the seedlings came from, and sometimes they do not know which cacao variety they're planting. The farmer is often promised that after two to three years, the cacao trees will start to bear fruit and their hard work will pay off once they can sell the dried beans or process the cacao beans further as *tableya*.

However, after two to three years, some farms have cacao trees that barely produce flowers with some trees being stunted. With this, farmers will spend another year or two and end up having to spend more money.

Harvesting of cacao pods as a result of traditional farming comes in two



“The growth of cacao roots was hindered as a result of selecting small planting bags,” Jack Sandique of Cacao PhilSense said.

harvesting seasons, the peak and the lean. Peak season starts in August, up to December, when you can harvest every other week. Lean season starts in January, and runs up to May, when harvesting is done monthly. The months of June and July are null months with little or no harvest at all.

Cacao PhilSense' new way of cacao farming, grooms the cacao trees, making the cacao pod harvesting to be done all year round, with no more peak or lean season.

Part of this new technique is carefully selecting the planting materials to be considered for grafting. The bud wood must come from a productive tree that produces high yield of cacao pods. The planting bags used for growing seedling in the nursery are much

bigger compared to the traditional ones being used. This allows the roots to grow even during the nursery stage in preparation for planting. Using this method of seedling preparation paired with proper land area preparation would result in the planted cacao seedling to start bearing fruits after one and a half year.

DOST–Bohol collaborated with Cacao PhilSense in conducting training workshops, one of which was in the farms in Bohol. The training was attended by cacao farmers, growers, and enthusiasts to replicate the success of a cacao farm in Mindanao, where they used the same method and techniques of properly preparing the planting materials to yield more cacao pods.

DOST-I boosts Laoag mango industry with native mango processing training

By Sheeren Joy N. Engada, DOST-I

Photos from DOST-I



The Department of Science and Technology (DOST) Region I, through the Provincial Science and Technology Ilocos Norte (PSTO-IN), in partnership with the Office of the City Agriculturist of Laoag, successfully conducted a training on Native Mango Processing on 04 May 2023 in Laoag City, Ilocos Norte. The primary goal of the event was to enhance the knowledge and skills of the Laoag Mango Growers Association Inc. in processing mangoes and turning them into profitable products.

The training was attended by 27 members of the association and equipped them with the necessary knowledge and skills for mango processing. The resource speakers, who were from Mariano Marcos State University, discussed various topics related to the mango processing industry. The six-part training included topics such as good manufacturing practices and food safety, overview of mango processing, hands-on training on making mango jam and mango candy, packaging and labeling, marketing skills, and simple bookkeeping. The participants were able to learn the step-by-step process of making mango products and were taught how to package, label, market, and keep track of their expenses and income to ensure the sustainability of their business.

Ms. Fairie Anne Domingo, one of the resource speakers, mentioned during the training that the original program solely focused on the techniques of processing mangoes. However, to provide a more comprehensive learning experience, they integrated different lectures.





The training was a success, with the participants gaining valuable knowledge and skills that will help them produce high-quality mango products and increase their income. The DOST-I hopes to conduct more training programs like this to help the local farmers and boost the agriculture industry in the region.



Engr. Shiela Marie N. Opelac, City General Services Officer I and City Agriculturist, City Agriculturist, reminded the participants to continue practicing and sustaining the knowledge they acquired to help them establish a successful mango processing business. With the new knowledge and skills they acquired, the Laoag Mango Growers Association Inc. is expected to boost their production and contribute to the growth of the local mango industry.





SUSTAINABILITY

Strategy Framework

iSTART program engages former *Balik-Scientist* and certified animal science expert to help the Municipality of Balungao

By Ginee R. Tacasa, *DOST-I*

A former *Balik Scientist* of the Department of Science and Technology (DOST) with expertise in animal science is helping the Municipality of Balungao in Pangasinan through the innovation, Science, and Technology for Accelerating Regional Technology-based Development or **iSTART** Program.

Being implemented by the DOST Region I (DOST-I), this initiative is an offshoot of a study conducted by the University of the Philippines School of Urban and Regional Planning through the Planning and Development Research Foundation, Inc. that identified the 20 growth areas in the entire Philippines. For Region I, the Province of Pangasinan was among them, with great potential for goat production.

The iSTART Program Management Team believes, early on, in the vision of the local officials who are committed and passionate about this project, so they engaged a well-known consultant in Animal Science—Dr. Jovita Datuin, who has been helping the municipality in this project already even before the iSTART program started in the municipality.

Former Pangasinan Governor, the Hon. Amado I. Espino III, had identified the six (6) pilot local government units (LGUs) for the iSTART Program —namely Sual,

Bugallon, Malasiqui, San Fabian, Alcala, and Balungao—to have a representation in each of the congressional districts of the province.

The Municipality of Balungao represents District 6 and is known as the major goat producer in the entire province—it is their One Town One Product (OTOP). Because of this, municipal officials identified the establishment of the Goat Academy as one of their priority projects during the focused group discussion conducted prior to the implementation of the iSTART Program in the municipality.

The local officials envisioned that the goat industry will be one potential area in the economic growth of the town, so it led to the plan of establishing the Goat Academy that will provide different services related to goat production such as producing numerous goods and high quality breed of goat. The academy is also seen to serve as a venue for trainings and eventually upscaling chevon [goat meat] products.

Through the initiative of the Local Chief Executive, Hon. Mayor Maria Theresa A. Peralta, they provided funds for the project under the iSTART program. Through the iSTART program, technology-based interventions for goat production management will be provided like various technologies, products, and processes

that make goat production

more profitable and the different training programs related to goat that will eventually be included.

On another front, the LGU officials also intends to focus on the treatment of the high level of sulfuric content in the water resources of the municipality, which can cause danger in the health condition of the people, including other natural resources such as their agricultural crops and the animals.

Recognizing this problem, the iSTART Program Management Team collaborated with well-known consultants to address the issues in order to support the LGU's goals and concerns. The group invited Prof. Maria Nilda Muñoz, also a former *Balik-Scientist*, to look into this project.

On 28 February 2023, the two consultants underwent an ocular inspection and met with Vice-Mayor Philipp Peralta, along with the other local and municipal officials, to further discuss the ways forward of the two projects. Dr. Datuin presented her proposal on how the Goat Academy will be established and operated, while Prof. Muñoz discussed her strategy for the water treatment project.

The iSTART Program is one of the flagship programs of the DOST that is designed as a convergence of all the programs/projects/activities that the department is implementing—technology transfer, training, consultancy services, S&T promotion, scholarship, and R&D, among others.

With the scientific and technological interventions provided, the iSTART program is dedicated to assist LGU Balungao in addressing the community's problems and to continue to deliver science, technology, and innovation in the locality for sustainable development.



DOST provides 186 million for S&T Fellows to create innovative solutions

DOST S&T Fellows Program continues to hire Filipino researchers for year 2023

The Department of Science and Technology (DOST) recognizes that human resources are at the heart of innovation and places great importance by hiring experts to be designated in its various agencies. The DOST continues to accept applications for the S&T Fellows Program, which aims to provide opportunities for Filipino researchers, scientists, and engineers (RSEs) to contribute to the socioeconomic development of the country through their research and development (R&D) outputs.

“We are thrilled to provide this opportunity for Filipino RSEs to contribute their expertise and knowledge to the development of our country. The S&T Fellows Program is a testament to our commitment to invest in the development of our human capital and to support innovative and impactful research initiatives,” said Secretary Renato U. Solidum Jr.

The S&T Fellows Program increases the R&D capacity of the Department with expertise and experience of Filipino experts in various fields. Currently, the program has engaged the services of 43 S&T Fellows in different DOST agencies and is looking at encouraging more science experts to join the program. By providing a platform for innovative and collaborative research, the program aims to produce R&D outputs that will uplift the lives of the Filipinos and provide innovative solutions to societal challenges.

Currently, one of the engaged Fellows, Dr. Varsolo Sunio, specializes in urban and regional planning and has conducted a research study on the impact of service contracts on the financial capacity of transport cooperatives in the Philippines to access financing for the Public Utility Vehicle Modernization Program or PUVMP. Another Fellow, Dr. Sarah Jimenez, specializes in mental health research

and has worked together with different faith-based leaders on the role of spirituality and religiosity in the therapy and recovery of individuals with mental health conditions in the Philippines.

“Innovation is at the forefront of our mandate in DOST, and experts play a crucial role in leading innovative R&D projects and programs that enable us to push boundaries and address the most pressing challenges facing our country today,” remarked Undersecretary for Research and Development Leah J. Buendia.

The S&T Fellows Program offers a unique opportunity for Filipino RSEs to work on projects that have the potential to create significant impact in the country. Fellows are expected to lead R&D projects, as well as access state-of-the-art facilities and equipment within DOST. They will also have the chance to collaborate with local and international experts in their respective fields.

The S&T Fellows Program is open to all Filipino RSEs who have an MS and a Ph.D. degree and at least three years of experience in R&D. For more information, you may visit their Facebook page: <https://www.facebook.com/DOST.STFellows> or DOST website: <https://tinyurl.com/ticeofVacancy2ndCall2023>

Interested applicants may submit their applications through email at sntfellows@dost.gov.ph. The deadline for submission is on 12 May 2023.

Department of Science and Technology
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Wastewater treatment technology “MEDDOW” promotes sustainable ecotourism in Romblon

By Mae Angelica F. Famini and Athena Colline V. Jacob, *DOST-MIMAROPA*

The Looc Fish Sanctuary in Looc, Romblon is one of the tourism prides of the province. It is recognized for its rich marine biodiversity, protecting more than 100 species of fish, sea creatures, and their ecosystem. It has also become known for its floating kiosk and a variety of water activities such as diving, snorkeling, and boating that tourists can enjoy. However, the sanctuary is also at risk of pollution from the large number of visitors. The sanctuary accommodates about 1,300 guests per month and increases during the peak months of April and May.

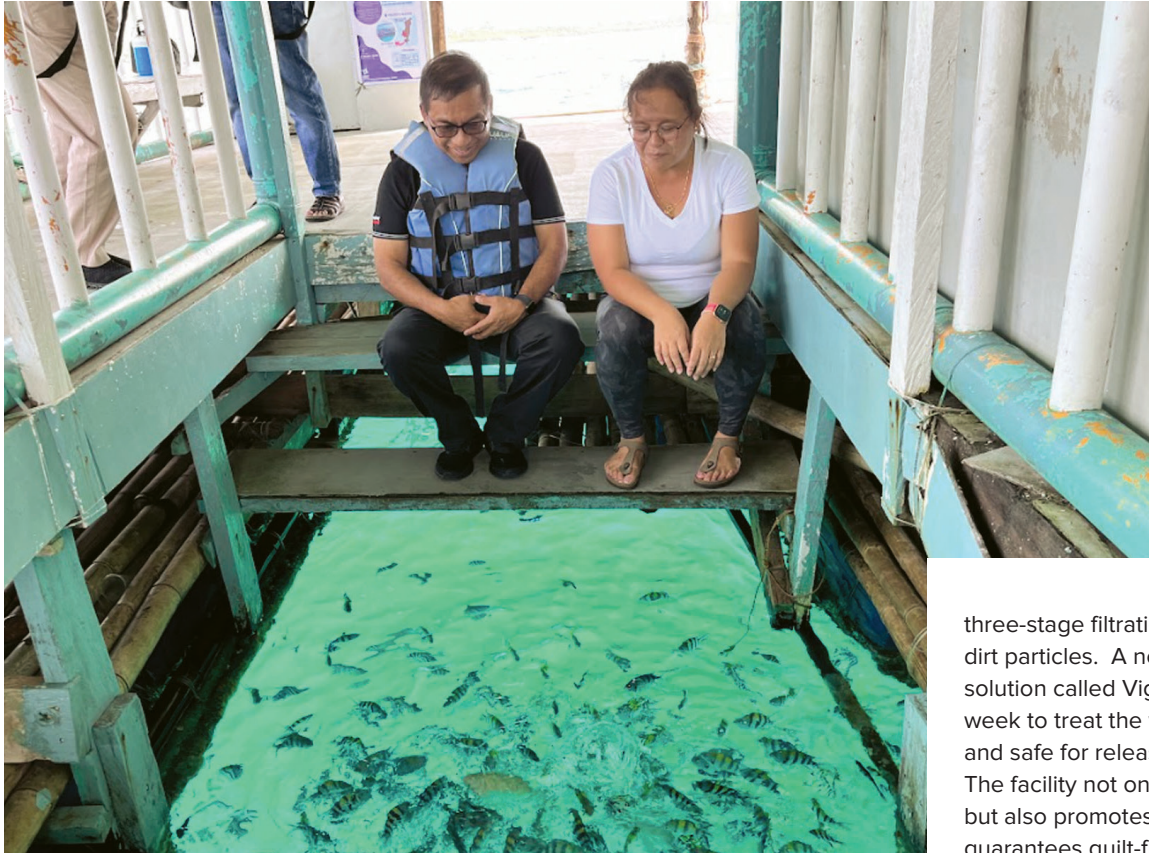
The floating platform of the sanctuary is suspended in the middle of the ocean, and the only access for tourists to the nearest land is via motorboat hosted by the municipality’s tourism office. When guests feel the need to relieve themselves, an improvised toilet is provided on the platform. Others secretly dispose of wastes into the water harming the sanctuary’s marine life.

To sustain protection of the area and promote safer tourism, a DOST-funded technology called the Modular Ecology-friendly Domestic Wastewater

(MEDDOW) Treatment Facility was introduced. MEDDOW was developed by researchers from Adamson University headed by Dr. Merlinda A. Palencia.

Through DOST-MIMAROPA Provincial S&T Office in Romblon, the first-ever floating MEDDOW in the country was introduced in the fish sanctuary.

The MEDDOW is attached to the sanctuary’s floating platform and uses an eco-septic tank and biofilters to treat the wastewater from the improvised toilet. The wastewater goes through a



DOST Secretary Renato U. Solidum Jr. (left) and Looc Mayor Atty. Lisette Arboleda tries the floating kiosk that uses the MEDDOW technology.



PSTO-Romblon Provincial Director, Ms. Marcelina V. Servañez (in yellow), explains the treatment process of MEDDOW to Sec. Solidum Jr. and guests in the sanctuary.

three-stage filtration to remove solid dirt particles. A non-toxic powdered solution called Vigormin is added once a week to treat the water, making it clean and safe for release into the ocean. The facility not only protects marine life but also promotes human comfort that guarantees guilt-free waste discharge.

“Sa Siyensya at Teknolohiya, Turismo ay Aarangkada” these are the words of DOST Secretary Renato Solidum when he visited the facility on 05 April 2023. The DOST chief shared that science and technology is significant in promoting ecotourism without compromising the health of the environment. Dr. Solidum stressed that even the simplest form of technologies such as the MEDOWW could contribute to preserving our natural resources.

Through MEDOWW, wastewater can be treated and high incidence of algae in the ocean that causes death of marine life could be avoided. This will also minimize the risk of exhaustion of marine resources for human consumption.

Dr. Solidum emphasized that using these technologies, people are given the privilege to enjoy the beauty of nature while learning to advocate for a pollution-free tourism.

DOST, partner agencies team up with tech startup for a drone-enabled seed dispersal project in Mt. Kalatungan

By Jenifer O. Pancho, *DOST-Bukidnon*



Around 315 participants gathered during the seedball making on 22-24 May 2023.



Seed balls produced from endemic trees coated with soil and organic manures to support their germination and growth.

To demonstrate an innovative reforestation technology by using drones in dispersing seed balls in a distant four-hectare patch in Mt. Kalatungan, the Department of Science and Technology (DOST), Local Government Unit GU Pangantucan, and the Protected Area Management Board – Mt. Kalatungan Range Nature Park (PAMB-MKaRNP) teamed up with tech startup Galansiyang, Inc. in dispersing 18,389 seed balls of native trees.

The activity was made possible after a collaborative three-day seed ball making participated by the Manobo-Talaandig community from *Barangay Mendis*, personnel from the Armed Forces of the Philippines and Philippine National Police, and students from Pangantucan Bukidnon Community College and Pangantucan National High School. The well-attended activity was designed for stakeholders to gain a sense of ownership and responsibility as the direct beneficiaries of the natural resources provided by the MKaRNP, particularly in the four-hectare remote area of the mountain range.

The improvised drones by Galansiyang Inc. were utilized to make the seed dispersal doable and faster in the identified GIDA areas on 31 May 2023.

This intervention is under the CEST (Community Empowerment through Science and Technology) project entitled “Utilization of the Innovative Technologies of Seed Balls and the Modern Drone Planting Method in a 4-hectare area of Mt. Kalatungan Range, Pangantucan, Bukidnon–D4” of DOST-Bukidnon to address the challenge of reforestation in the area – accessibility and low-germination.

Seed balls are composed of seeds from endemic trees coated with soil and organic manures to support their germination and growth. The seeds are *narra*, *banaba*, *kupang*, *balite*, and *ulayan* (*pawoga*, *balangbangan*, and *talingtingan*) from the Department of

Environment and Natural Resources–Ecosystems Research and Development Bureau and indigenous people of Mt. Kalatungan.

Datu Erio Inahan, the head of the Indigenous People community and the donor of the four hectare land, expresses his gratitude to DOST for giving attention to the denuded area of Mt. Kalatungan.

DOST–Bukidnon Provincial Director Ms. Ritchie Mae L. Guno said that the next steps would be aerial monitoring every quarter to be conducted by Galansiyang, to conduct inventory of the germinated seed balls, while DOST, PAMB, the IP community and other stakeholders will conduct the ground monitoring.



CALL FOR NOMINATIONS!

SINAG

S&T INNOVATIONS IN AGRI-AQUA AWARD

DEADLINE: MAY 31, 2023

QUALIFICATIONS

The award is open to:

- All Filipino individuals/ group of individuals/institutions who have shown outstanding performance on technology generation, facilitation and enablement, and commercialization of a locally generated technology;
- Individuals/ groups/ institutions shall only be qualified if they showcase technology that has been commercialized already for at least two years preceding the award;
- The featured technology should not have been previously conferred with a technology commercialization award by PCAARRD on the same category.
- As applicable, nominees must have been cleared of their obligations for administrative and reportorial requirements (e.g., audited financial, terminal reports) after having engaged in DOST-PCAARRD projects.



S&T IN

AWARD CATEGORIES



Innovator

It aims to recognize the **merit of the technology** being commercialized



Facilitator/Enabler

It aims to recognize the **contribution of the facilitators/enablers.**



Adopter

It aims to recognize the **entity** that successfully commercialized a technology



THE GUIDELINES AND NOMINATION FORMS CAN BE DOWNLOADED HERE:



<https://pcaarrd.dost.gov.ph/index.php/awards>



INNOVATIONS IN AGRI-AQUA AWARD

Nominations for 2023 *SINAG*: S&T Innovations in Agri-Aqua Award now open

By Rosemarie C. Señora, *DOST-STII*

Are you an innovator, enabler of a technology, or an adopter that successfully commercialized a technology? This is your time to get recognized!

Department of Science and Technology –Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development (DOST-PCAARRD) is now accepting nominations for the 2023 *SINAG*: S&T Innovations in Agri-Aqua Award.

The *SINAG* Award aims to recognize the effort of an individual, group of individuals, or organization instrumental in the successful adoption and commercialization of a component technology or package of technologies.

As mentioned, *SINAG* Award will recognize three entities involved in the commercialization of a technology such as the innovator, commercialization facilitator or enabler of a technology, and the adopter/entity that successfully commercialized a technology.

It will focus on technology commercialization, which refers to the technology transfer pathway of deriving income or profit from a technology, such

as through the creation of a spin-off company, licensing, or the sale of the technology and/or intellectual property rights, in the agriculture, aquatic, and natural resources sectors.

The award is open to: All Filipino individuals/group of individuals/institutions who have shown outstanding performance on technology generation, facilitation and enablement, and commercialization of a locally generated technology;

Individuals/groups/ institutions shall only be qualified if they showcase technology that has been commercialized already for at least two years preceding the award;

The featured technology should not have been previously conferred with a technology commercialization award by DOST-PCAARRD on the same category; and

As applicable, nominees must have been cleared of their obligations for administrative and reportorial requirements (e.g. audited financial, terminal reports) after having engaged in DOST-PCAARRD projects.

Each entry shall be accompanied by the nomination letter and the nomination form.

Nomination shall be endorsed by: (1) the head/authorized representative of an agency/ organization; and (2) the regional consortium director or DOST regional director.

Please be informed that the full guidelines and nomination forms can be accessed and downloaded via the PCAARRD website (<https://pcaarrd.dost.gov.ph/index.php/awards>).

Nominations and entries should be submitted or endorsed to the Executive Director of DOST-PCAARRD on or before 05:00 PM of 31 May 2023. Further announcement will be posted via DOST PCAARRD official Facebook Page (<https://www.facebook.com/PCAARRD>).

#PCAARRD
#PCAARRDawards2023
#SINAGAward2023
#CallforNominations

WELL-BEING

Strategy Framework



Tekno Presyensya showcases women in leadership, promotes advancement in gender equality through science education

By Christian Dominic Casimiro, DOST-I

The fourth episode of the weekly radio program, “*Tekno Presyensya: Syensya ken Teknolohiya para Kadagiti Umili*”, hosted by the Department of Science and Technology Region 1 Office (DOST-I) and in collaboration with DZAG *Radyo Pilipinas* Agoo, featured Dr. Ronnalee N. Orteza, Campus Director of the Philippine Science High School–Ilocos Region Campus (PSHS-IRC).

better or who’s not, or who has offered more, or who has less. But science should be a melting pot of ideas coming from people of different fields and backgrounds, and different sexes,” she explained.

She further reiterated that it is necessary to understand and identify the gender gaps in science education to provide appropriate solutions. She presented various data where gender gaps were

are slowly going there in our goal to achieve gender equality in all aspects and not just in science education.

Dr. Orteza also stated that “gender equality starts at home,” and she encouraged parents to show and promote gender equality to topple down gender discrimination by making our young ones realize that men and women are all capable of doing tasks.



The episode, aired on 16 Mar 2023 via Zoom and streamed live via the DOST Region I and DZAG Facebook pages, highlighted her thoughts and insights on advancing gender equality through science education.

In line with the celebration of the National Women’s Month last March, Dr. Orteza presented the importance of promoting gender equality in the fields of science, technology, engineering, and mathematics (STEM). She noted that in the DOST hymn lyrics, it was emphasized that “*ang siyensya’y sandigan ng maunlad na bayan.*” This is a reminder that science holds a vital role in achieving national progress and development where progress knows no gender and science does not serve a specific gender. “Science and technology should not be a battleground between sexes of who is

very imminent, where women are under-represented both in global and local settings.

At the PSHS-IR Campus, young women are highly encouraged to indulge in STEM activities in achieving gender equality through science education. Dr. Orteza showed different data and graphs for the different gender roles, like in leadership and in the STEM fields, where it showed that the ratio between men and women remained uneven, with men are still ahead based on the reports. On the other hand, Dr. Orteza stated that in some data women are ahead in some courses like agriculture, arts & humanities, education, health & welfare, natural sciences, and social sciences, through the midst of male dominance. She further said that in today’s time we

Dr. Orteza further gave her message to her fellow educators to give everyone equal opportunities for both genders to participate in STEM activities. She encouraged also the parents to try and enroll in PSHS-IRC as they have their system for promoting gender equality, like training offered for both gender and inviting female scientists as guest speakers to encourage and empower young women in taking up STEM fields. But she stressed that they also invite male guest speakers in the education course field to break down the stigma of classifying courses based on gender, and they also collaborate with different social media influencers or agencies to promote gender equality as they want to reach out to more people in attaining and promoting gender equality through science and education.

With the role played by and mentorship of Dr. Orteza and the PSHS-IRC, gender equality is strongly promoted through science education. This initiative is shared to the entire DOST system, with all attached agencies and regional offices, implementing various initiatives to break stereotypes and the stigma of classified gender roles. This shared advocacy is fully supported by the DOST to foster unity in achieving more success together, as leadership is not only for men but, it is also for our women; as we say “*Hindi sila babae lang, sila ay babae.*”

Young Pinoy scientists take center stage during the Earth Day celebration of NAST PHL

By Caryl Maria Minette I. Ulay, *DOST-STII*

An advance advocacy demonstration for the World's Earth Day celebration was conducted by the National Academy for Science and Technology of the Philippines (NAST PHL) through the 2023 NAST Environmental Science Award (NESA) Paper Presentation and Awarding Ceremony and the NAST Talent Search for Young Scientists on 21 April 2023, at the Eastwood Richmond Hotel via Zoom and Facebook live.

In 2001, the NAST–Hugh Greenwood Environmental Science Award, now known as NESA, was organized by the NAST President and National Scientist, Perla Santos-Ocampo, with the help of the Children's Research Fund and philanthropist Dr. Hugh Greenwood.

The recognition pursuit is undertaken to commend remarkable scientific and technological studies with a notable share in protecting and conserving the natural resources of the country. This year's award was claimed by physicist Dr. Draneb Earl O. Juanico, who conquered the title against six other proficient nominees that underwent rigorous selection and deliberation of the NESA Board of judges.

The awarding ceremony was graced by Academician Jaime C. Montoya, President of NAST PHL. Academician Montoya warmly expressed his appreciation for the flourishing support and partnership of the government and non-government agencies, academe, and private sectors in implementing projects and policies to mitigate the impacts of catastrophes and environmental degradation.

"Congratulations to our awardee. I hope you will inspire other scientists, especially the young, to pursue careers



in science that are meaningful to society and our country," insinuates Academician Montoya to the adjudged awardee, Dr. Juanico. Another pat on the back and golden advice was left for the awardee by Dr. Rhodora V. Azanza. "Serve your science and most importantly serve the people, especially here in the Philippines" said Dr. Azanza, who is also a NESA recipient.

"We commend the hard work of our environmental advocates who protect and conserve our natural resources. We honored them by their strong support to defend and preserve our environment," said Department of Science and Technology (DOST) Secretary Renato U. Solidum Jr. in his message delivered by NAST Director Luningning Samarita-Domingo.

The center of the event was Dr. Draneb Earl O. Juanico uncovering the findings of his winning study titled "Does Mangrove Restoration Imply Coastal Protection?", which may ride on the height of matters in rehabilitation

projects of affected areas in the Visayas due to Typhoon Haiyan or Yolanda and the controversial "dolomite beach" in Manila Bay, along Roxas Boulevard, Malate, Manila.

Using drones, the group led by Dr. Juanico simulated scenarios involving mangrove trees known as *Rhizophora* spp. around two coastal sites in Leyte and Iloilo that have been struck by storm surges driven by category five storm winds.

The visual presentation of the simulation revealed that *Rhizophora* spp. can serve as a "green barrier" with sustainable bio-shield characteristics. It help protected areas dry down quickly after being submerged by storm surges compared to those areas without mangroves.

"Mangroves tend to counter the current of the wind and waves to prevent its direct impact and heavy swell to nearby coastal towns. This implies faster recovery and restoration of damages to coastal communities," explained Dr. Juanico.

Mangroves are expected to be fully established after 20–25 years, which caused debate among policymakers and stakeholders and also among some participants during the open forum. According to Dr. Juanico, the maturing stage of mangroves may be accelerated by using new technologies. Aside from this, he mentioned that mangroves can be a good breeding place for shrimp and crabs that can nourish fishing communities and increase economic returns, which is an encouraging point for the investment.

Furthermore, the awardee expressed his intention to build a mobile application as a way to communicate with stakeholders regarding the essential information drawn from their study.

“Later on, we look forward to building an app that can visually project the simulation. We want to show where mangroves are located, how they should be cultivated, and other helpful information to utilize it for coastal protection,” uttered Dr. Juanico about the way forward of the study.

The winner of 2023 NESA bags a cash prize, a dazzling plaque of recognition, and a PHP 2 million research grant from the DOST.

Meanwhile, then afternoon session was allotted to the NAST Talent Search for Young Scientists participated in by seven young and brilliant researchers from different universities and from the DOST-Industrial Technology Development Institute.

This initiative of NAST is a strategy to drive young people into S&T career path. “You are all winners. Although we still have to choose based on priorities, I can see that the future of science is in good hands,” said National Scientist Raul V. Fabella, appreciating the finalists in his message.

All of the finalists were given a chance to present their paper and refuted lingering queries from the judges and participants. The outstanding paper was scheduled to be announced on 17 July 2023 during the NAST annual scientific meeting. For now, they were given certificates for their successful presentations.

The winner of the NAST Talent Search for Young Scientists will be rewarded with PHP 500,000 research grant from the DOST.

NAST TALENT SEARCH FOR YOUNG SCIENTISTS
Paper Presentation
 April 21, 2023 | 1:00 PM

Finalists

| | | | |
|--|---|--|--|
|  MICHAEL T. CASTRO University of the Philippines Diliman |  JAYSON C. COSME University of the Philippines Diliman |  NEIL JEROME A. EGARGUIN University of the Philippines Los Baños |  IVAN HENDERSON V. GUE De La Salle University Manila |
|  JOHN PAUL MATTHEW D. GUZMAN DOST-Industrial Technology Development Institute |  ANN FRANCHESCA B. LAGUNA De La Salle University Manila |  CHARLON A. LIGSON University of the Philippines Diliman | |

 #PilipiNAST
 “A progressive Philippines anchored on science”


NAST ENVIRONMENTAL SCIENCE AWARD
Paper Presentation and Awarding Ceremony
 April 21, 2023 | 9:00 AM



Drandreb Earl O. Juanico, Ph.D.
 Technological Institute of The Philippines

“Does mangrove restoration imply coastal protection? A prospective simulation study”

 #PilipiNAST
 “A progressive Philippines anchored on science”




DOST officials, headed by Dr. Renato U. Solidum, Jr. (center), together with NAGA officials during the inauguration of the revitalized Bicol Science and Technology Centrum.

DOST, LGU-Naga launch the PHP 6.9 million revitalized Bicol Science and Technology Centrum

Text and photos from DOST-PCIEERD

The Department of Science and Technology (DOST) and the Local Government Unit (LGU)—Naga—officially reopened the Bicol Science and Technology Centrum (BSTC) on 16 March 2023, following a revitalization and improvement project that started in April 2021.

With a PHP 6.9 million budget, the BSTC is now ready to cater again to the local viewers—especially children, teachers, and even researchers and innovators who can experience science through visiting the center.

DOST Secretary Dr. Renato U. Solidum, Jr. reminded the populace that such facilities would also be the best means of promoting science literacy and

appreciation, particularly among younger students. “Since BSTC was established in 1995, the Bicol Region has benefited from the services it has provided. As it was reopened this year, we planned to take advantage of it by leveraging science in the area in line with the inclusive, innovative, and integrated approaches we aimed for the department,” the secretary shared.

Mayor Nelson S. Legacion of Naga also expressed his enthusiasm for the center’s opening. “The BSTC has always been a sight to look forward to as part of the cultural tourism in Bicol,” he said. “With its launch, we hoped to encourage young people in the area to pursue careers as researchers and scientists.”

The revitalized and improved BSTC will now house 50 interactive exhibits in five galleries such as the following:

Gallery 1: Marvels of Physics: Electricity, Magnetism, and Robotics The gallery housed the advancements in technology made possible in robotics through electricity, magnetism, and robotics. The displays include: a robot exhibit, a plasma ball, a buzz wire, a drone exhibit, a van de Graff floating ball exhibit, an interactive screen, virtual reality, interactive gears, reaction time for two players, and a motion sensing screen.

Gallery 2: Mysteries of the Universe Explained: the Solar System and Space Exploration. This section



During the center's opening, DOST officials paid a visit to the newly rebuilt Bicol Science and Technology Centrum.

their area, especially for kids, it is easy to appreciate and understand science. This fantastic feature is provided by the center.”

DOST-V Regional Director Rommel R. Serrano also expressed his gratitude that the center will finally have a rebirth since it was closed in 2016, and it is anticipated to attract twice as many visitors as in previous years. “We anticipate a very positive response from our students, teachers, and the local community, particularly from the people of Naga who have observed the impact on students’ appreciation of science over time. With the center, we hoped to inspire not just the town but also the surrounding areas to establish their own science centers.”

The center is open to the public, and group tours and walk-ins are both welcome Monday through Friday from 8 A.M. to 5 P.M. For further information, call 0919-914-8858, send an email to bstc@naga.gov.ph, or visit the Naga website at www.naga.gov.ph.

For inquiries and clarifications, please coordinate with Ms. Allane M. Orendez, Media Relations Officer, at (927) 752-7314, pcieerdmedia@gmail.com, or allane.orendez@pcieerd.dost.gov.ph.

allows visitors to view the planet's place in the solar system and beyond as mankind continues to explore the universe. The displays include all about planets, voyager distance display, constellation light tracing, weight on other planets, astronaut cutout, astronaut display, and the human gyro exhibit.

Gallery 3: What Lies Beneath: Uncovering Earth's Secret Featured exhibits are the volcano cross-section exhibit, sound domes and interactive display, coal mining, sand exhibit, rock display, interactive screen, volcano flip book facts, stalactites, and stalagmites.

Gallery 4: Underwater Wonderland: Beneficial yet Threatened Aquatic Ecosystems. The gallery is comprised of the following displays: an interactive submarine, interactive fishes, marine life, ecosystem rotating panels, coral displays, a whale shark, a tsunami wave tank, an ocean pollution mural, a jellyfish

exhibit, an octopus exhibit, a turtle and tortoise exhibit, a whirlpool exhibit, scuba gear 1 and 2, water reaction, and an earthquake simulator.

Gallery 5: Land Ecosystem Unfold: Discovering Mother Nature Displays include an artificial tree or replica of a rafflesia, a nature texture exhibit, a windmill exhibit, a sand-filled area, farming tools, the Mt. Mayon and Mt. Isarog Lenticular Wall, a barnyard exhibit, and creepy crawlies.

Dr. Enrico C. Paringit, Executive Director of DOST-PCIEERD (the Philippine Council for Industry, Energy, and Emerging Technology Research and Development), who monitors the project, added that it is beneficial to have regional influences in our museums. “In the case of DOST Region V’s BSTC, these are readily apparent in the attractive features of the galleries. “If there are better examples, they can see that they are organic in



GALLERY 3: What Lies Beneath: Uncovering Earth's Secret.



GALLERY 4: Underwater Wonderland: Beneficial Yet Threatened Aquatic Ecosystems.



Department of Science and Technology Undersecretary for Scientific and Technical Services Ms. Maridon O. Sahagun (6th from left) poses with DOST-STII Director Richard P. Burgos (in brown shirt), DOST-STII IRAD Chief Alan C. Taule, (5th from left) and BPI Foundation, Inc. Executive Director Owen L. Cammayo (7th from left) for its donation of P70,000 worth of STARBOOKS-enabled computer sets, printers, and WiFi routers to be donated to 10 selected schools and communities in GIDAs.

Young learners learn financial literacy from DOST-STII-BPI Foundation partnership

By Rosemarie C. Señora, *DOST-STII*

From being a platform for sharing content, STARBOOKS—short for Science and Technology Academic and Research-Based Openly Operated KioskS—has now evolved as a platform for sharing advocacies.

This is how Department of Science and Technology–Science and Technology Information Institute (DOST-STII) Director Richard P. Burgos describes the recent advancement as the agency partners with BPI Foundation, Inc., in its efforts to bring science, technology, and innovation (STI) information to learners in geographically isolated and disadvantaged areas (GIDAs).

Since its humble inception as the first science library-in-a-box in 2011, STARBOOKS has now thousands of digital resources on science, technology, engineering, and mathematics (STEM) that are easily retrievable both in its

offline and online platforms, as well as various advocacies of its partner institutions, the latest of which is the addition from the BPI Foundation, Inc.

FINED UNBOXED IN STARBOOKS

Committed to furthering the advocacy in financial literacy, BPI Foundation, Inc. recently launched in STARBOOKS its FinEd Unboxed. Screenshot from the audio-visual production (AVP) of the launch.

FinEd Unboxed is a customized financial education program that seeks to improve the financial capability of our everyday heroes such as the Department of Education (DepEd) teaching and non-teaching personnel, and migrant domestic workers and their families.

Through the program, it is hoped to empower its audiences to become

financially responsible by unpacking and simplifying lessons on personal money matters such as saving, budgeting, investing, insurance, retirement planning, and managing credit.

In a simple ceremony held at DOST-STII on 11 April 2023, BPI Foundation, Inc. Executive Director Owen L. Cammayo said that they are grateful for the opportunity to share with DOST-STII the advocacy for financial literacy and wellness.

“We are here today because we see the value and we believe that education is a viable tool for financial wealthness,” he said, adding that the modules are perfect for the students, teachers, and even non-teaching personnel.

BPI Foundation, Inc. Executive Director Owen L. Cammayo shares about the foundation’s advocacy on financial education.



BPI Foundation, Inc. Executive Director Owen L. Cammayo shares about the foundation's advocacy on financial education.



Screenshot from the AVP of the launch

BPI Foundation is also currently developing financial education materials for young learners, which will not only enrich the learning experience of the students but also equip them with the financial knowledge and skills they need to thrive in the future.

With this, Cammayo also encouraged everyone to not just promote STEM but also help encourage financial wellness as well.

In her speech, DOST Undersecretary for Administration Michael Kristian R. Ablan, in his speech, congratulated DOST-STII and BPI Foundation, Inc., acknowledging that furthering science and technology causes in the country would go hand-in-hand with the foundation's advocacy of teaching

financial literacy.

"We believe that financial literacy is an important foundation in entrepreneurial skills and that this is truly a promising opportunity as it is important that we arm our learners of financial literacy," she said.

DEPED TO PUSH EQUITY AND EQUALITY IN PH EDUCATION

Moreover, DepEd Undersecretary for Administration Michael Kristian R. Ablan, in his speech, congratulated DOST-STII and BPI Foundation, Inc. for the collaboration, and wishes that more partnerships will arise with DOST-STII and other DOST agencies to further promote equity and equality in education in the country.

"Equality is where we provide information to all. *Lahat pwedeng makapunta sa STARBOOKS KIOSKS, at lahat pwedeng mag-access ng mga materials.* Second is equity, to reach people with no access such as GIDAs. *Kailangan walang iwanan,*" said Ablan highlighting the mantra of DepEd that no learner should be left behind.

He also congratulated DOST-STII's STARBOOKS for filling the gap until such time that internet connection can be accessed all throughout the country, and BPI Foundation's advocacy which he said can help teachers to learn and be able to overcome their financial challenges.

BPI FOUNDATION DONATES 10 STARBOOKS-ENABLED COMPUTER SETS

BPI Foundation, Inc. also sponsored P700,000 worth of STARBOOKS-enabled computer sets, printer, and wifi routers to be donated to ten (10) selected schools and communities in GIDAs.

First of which to receive is the Doña Paz Sumulong Tanjumatco Elementary School in Tanay, Rizal.

"*Maraming salamat po sa ibinigay ninyo sa amin dahil napakalaking bagay po nito para sa mga mag-aaral at sa mga guro. Hindi na po nila kailangan mag-download pa ng mga kinakailangan para sa kanilang pagtuturo,*" said Nieva Tongohan, school head of the elementary school with approximately 185 students.

The rest of the beneficiaries are Lagnas Elementary School, Uguis Integrated School, Legua Integrated School, Magsayap Integrated School, Kinablangan Elementary School, Kitubao High School, Indigenous People Community of Brgy. Tabon, Busay National High School, and Solangon Elementary School.



High school students in General Trias learn beyond the basic 5Ws and H of science writing

By Allan Mauro V. Marfal, *DOST-STII*

It has been a hectic schedule in the previous weeks for some students and faculty staff from the Governor Ferrer Memorial Integrated National High School (GFMINHS) in General Trias City in Cavite, as they were preparing for the Division Schools Press Conference and in a few weeks from now for the Regional Schools Press Conference (RSPC).

These competitions are the battleground for elementary and secondary students in the country as they slug it out to be top young journalists for different categories such as news, sports, and science.

On 25–26 May 2023, 60 students from Grade 7–Grade 11 participated in a science communication seminar-workshop organized and conducted by the Department of Science and Technology-Science and Technology Information Institute (DOST-STII).

Its objective was to help the student-qualifiers prepare for the upcoming RSPC and to give the student-participants basic knowledge on crafting compelling and engaging stories related to science, climate change, and the environment.

“Initially, it was for the students to learn the basic 5 W’s and H of science writing, but it exceeded our expectations. Through this training, we learned that science stories have a greater purpose than creating a good one,” said Madonna Ferrer, faculty staff and school publication adviser from GFMINHS.

It was a two-day seminar-workshop under the “Science Journo Ako Advocacy” program of the DOST–STII, which aims to capacitate and enhance the skills of students, researchers, scientists, and the media in creating science content suitable for various platforms such as print, online news sites, and social media channels. However, beyond that is to have a better understanding and appreciation of the vital roles of communicating science and its benefits to the public.

One of the speakers was Krixia Subingsubing, a young but experienced science-beat reporter from the Philippine Daily Inquirer.

She shared various tips on how to find a better or more compelling

story angle out of that information culled from various sources such as published scientific journals, technical presentations, and expert interviews.

Subingsubing gave emphasis on choosing a story angle, especially related to science, and said that we should think of existing issues or concerns that these technologies or research could be addressed or provided appropriate and timely solutions.

“Writing science stories are all about connecting the scientists’ or experts’ suggested solutions to their intended beneficiaries. Out of those raw data or sets of information provided to us, let’s find those details and put it in your story,” said Subingsubing.

She also added that you may evaluate your story ideas by asking these questions yourself. Does it offer new findings? Have others covered this story? Is it significant to the public. Is this something your parents, siblings, or friends will find interesting? Does the story have high stakes?



Some 60 students from Grade 7 –11 of Governor Ferrer Memorial Integrated National High School learned the rudiments of popular science writing and tips on creating compelling content about science using social media in a two-day seminar-workshop organized and conducted by the DOST-STII (photos by Rhea Mae B. Ruba, DOST-STII).

Subingsubing also reminded the student-participants that in writing and reporting a science story, we should do our due diligence to research our topic and develop some sort of critical thinking in all the information that we receive from various sources.

“Our science stories play an important role as all the information that we shared, on how we presented those facts and data, could be the basis of everyone in making decisions to their everyday life,” Subingsubing said.

The young and dynamic resource speaker also shared some tricks in conducting interviews with our scientists and researchers to make them comfortable with you to share necessary and interesting data and information about their products and research.

“Writing for science is beyond presenting the 5Ws and 1H that we all know but also the so what of our articles. Science stories present data and findings that could affect our lives. Let’s make our science stories to be an agent of change in our society by allowing our readers to have better-informed decisions.

Meanwhile, aside from lectures on science news and feature writing, the seminar workshops also discussed social media content creation and basic principles of design and layout.

DOST–STII’s Allan Mauro V. Marfal and Rosemarie C. Señora shared their knowledge and experience in creating engaging content for multimedia platforms.

“We would like to extend our appreciation to the DOST-Science and Technology Information Institute and Ms. Krixia (Subingsubing) for the opportunity given to our young learners. It is a kind of significant event that happened in our humble school. Looking forward to another very successful activity to be conducted in our school as part of your advocacy program,” said in a statement by GFMINS Principal Ramy Dalida.

“Science and technology have numerous practical applications in our daily lives, and it is our mission at DOST-STII to produce young, dedicated, and capable science communicators who can share phenomenal science stories with every Filipino. Our goal is to make science

fun and exciting and to disseminate it through the platforms preferred by Gen Z and Gen Alpha,” said DOST-STII Director Richard P. Burgos in a video message.

This seminar-workshop is one of the activities of the Science Journo Ako advocacy program of the DOST-STII that started in 2015, in partnership with various academic institutions, state universities and colleges, and organizations that seek to strengthen science communication and instill a culture of science among the students, faculty, researchers, and industry practitioners. To date, SJA has already conducted 43 seminars/webinars, capacitating some 12,000 students, researchers, and science communication advocates.

If you want to bring your Science Journo Ako workshops to your school or area, you may e-mail us at sciencejournoako@gmail.com or message us through our official Facebook page: Science Journo Ako.

9,776 incoming college freshmen qualify as S&T scholars

By DOST-SEI

The Department of Science and Technology–Science Education Institute (DOST-SEI) announces the eagerly anticipated results of the highly competitive science (S&T) and technology scholarship examination today, unveiling a new batch of senior high school students who are poised to embark on an exciting academic journey as S&T scholars when they go to college.

Out of 79,585 examinees who took the national qualifying exam last 18–19 March 2023, 9,776 qualified to the 2023 DOST-SEI Undergraduate S&T Scholarship Program and will begin enjoying the benefits of their scholarship at the start of the first semester of the academic year 2023–2024.

This year’s pen-and-paper qualifying examination was conducted in 241 testing centers nationwide and marked the resumption of the face-to-face exam after three years of pause caused by the pandemic. During that period, the Institute identified the qualifiers through data analytics.

Out of the total number of passers, 5,561 qualified as scholars under the Republic Act 7687 Scholarship Program, which is the scholarships for academically talented students of economically disadvantaged families. Meanwhile, 4,215 qualified under the DOST-SEI Merit Scholarship Program. In addition, 1,224 more potential qualifiers—whose names do not appear in the published list—are also under consideration, pending revalidation of some requirements.

The qualifiers will receive their Notice of Award, while the potential qualifiers will receive advice on the requirements they must resubmit. After which, all the qualifiers, with their parents/legal guardians, are invited to attend the orientation on S&T Scholarship Policies and Procedures.

“The announcement of the scholarship exam results marks the beginning of a transformative chapter in the lives of the qualifiers. We believe that they now have the freedom to pursue their dreams and aspirations of S&T careers without constraint,” said Dr. Josette T. Biyo, DOST-SEI Director.

Qualifiers who will avail of the scholarship will enjoy benefits for the duration of their S&T degree program, which include a monthly stipend of PHP 7,000, tuition fee subsidy of up to PHP 40,000 per academic year for those who will enroll in private universities and colleges, learning materials and/or connectivity allowance, MS/PE clothing allowance (one-time only), one economy-class roundtrip fare per year for those studying outside of their home province, outright thesis allowance, graduation allowance, and group accident insurance.

The qualifiers must pursue a Bachelor of Science (BS) degree program in any of the priority fields of study at a state university or college or any private higher education institution recognized by the Commission on Higher Education as a Center of Excellence or Center of Development or with FAAP Level III accreditation for the BS program that they

intend to enroll in. The list of priority S&T programs is posted on the SEI website.

“As these qualifiers continue on their academic paths, their success in the qualifying exams signifies their immense potential in the S&T field and thereon look forward to limitless opportunities it can unlock. The support our program offers will enable them to explore their scientific interests and pursue higher education, setting them on a path to become the next generation of scientists, technologists, innovators, and problem solvers,” Dr. Biyo added.

Upon completion of their degree programs, scholars under RA 7687 and Merit programs shall be working in their fields of specialization in the country, whether in the public or private sector, for a period equivalent to the length of years in which they enjoyed the scholarship.

The DOST-SEI is the service agency of the DOST mandated to accelerate the development of S&T human resources in the country by administering undergraduate and graduate scholarships and advanced specialized training, promoting S&T culture, and developing innovative science education innovative programs.



Photo from the DOST-SEI

Hypertension among Filipinos down, study says

By Geraldine Bulaon-Ducusin, DOST-STII

Despite the increase in the prevalence of hypertension among Filipino adults, 20 years old and above from years 2013–2015, its prevalence significantly declined in 2018–2019.

This is based on the study on “Prevalence and Factors Associated with Hypertension among Filipino Adults in Different Survey Periods,” of which the data comes from the 2013 National Nutrition Survey, 2015 Updating of the Nutritional Status of Filipino Children and Other Population Groups (Updating Survey), and the 2018–2019 Expanded National Nutrition Survey by the Department of Science and Technology–Food and Nutrition Research Institute (DOST-FNRI).

This research is important in understanding the downward trend and in identifying the factors associated with hypertension that can help further reduce its prevalence by 33% between 2010–2030. This is one of the global targets for noncommunicable diseases (NCDs).

The percentage of controlled hypertension, that is, having a blood pressure (BP) of less than 140 mmHg (systolic) and less than 90 mmHg (diastolic) and taking anti-hypertensive medication among persons with hypertension, improved from 20.7% in 2015 to 29.4% in 2018–2019. Alongside the improvement in controlled hypertension, data shows that the use of anti-hypertensive medications also increased in 2018–2019. The reduction and control of high blood pressure to target levels in individuals with hypertension is important to minimize the risk of major adverse cardiac and cerebrovascular events or all-cause mortality.

Adults aged 60 years old and above, had the highest percentage of

controlled hypertension in 2013, 2015, and 2018–2019, and it was observed that the rate increased with age.

It was also observed that controlled hypertension is more common among females. This can be explained by their higher level of attention to healthcare and adherence to prescribed medications. Further, female hearts have the ability to adapt to BP accordingly due to thicker blood vessel walls that can withstand sudden increases in BP.

The DOST-FNRI study finds that adults with higher educational attainment had higher rate of controlled hypertension than those with lower educational status. A similar finding was reported in a related 2014 research, which finds that adults with higher educational status tend to have increased awareness, better income, and better access to anti-hypertensive medications compared to those with lower educational attainment.

Other findings show that hypertension is more common among males and among adults with higher educational attainment and wealth status. The socio-demographic and economic factors that are significantly associated with hypertension are older age and higher wealth status, whereas NCD risk factors that have positive associations with hypertension are obesity, high waist circumference and high waist-hip ratio, alcohol drinking, and binge drinking.

The prevalence of hypertension was also highest among pensioners (a person who receives or lives on a

pension) in 2013 and 2015 surveys, whereas in 2018–2019, the prevalence was highest among adults with no occupation.

Hypertension is known to be a silent killer because most people show no early symptoms or its signs and symptoms are misunderstood. Raised BP develops slowly over time and can be related to many causes. It is highly associated with other NCDs due to constricted blood flow, which can damage the arteries, leading to heart diseases. Persistent elevation of BP results in an increased risk for heart disease, heart failure, and stroke, and is considered a major cause of premature death worldwide.

Chona F. Patalen, one of the researchers said that their research team recommends that programs and policies should be intensified focusing on mandatory and regular BP monitoring, adherence to healthy lifestyle advice, particularly on decreasing sedentary activities and engaging in aerobic physical activities, patient-centered treatment plan, and systematic follow-up.

The full discussion of this study can be accessed online for free from the Philippine Journal of Science (PJS) portal, February 2023 issue (<https://philjournalsci.dost.gov.ph/>). PJS is the oldest science journal in the country published by the Department of Science and Technology-Science and Technology Information Institute (DOST-STII).



DOST-PCHRD funds UST study on bacteriophages for food safety

By Rosemarie C. Señora, DOST-STII

This summer, one common issue is the rapid spoilage of food due to use of contaminated ingredients or poor handling and preparation of food.

With this concern in mind, researchers from the University of Santo Tomas (UST) explored the use of bacteriophages (BPs) in maintaining food safety, with support from the Department–Philippine Council for Health Research and Development (DOST-PCHRD).

BPs are viruses that can infect and kill bacteria without any negative effect on human or animal cells. They are also considered to be cost-effective, accessible, and able to withstand food preparation conditions, and can have a relatively long shelf life, which are relevant in maintaining food safety.

Led by Dr. Jose H. Bergantin Jr. and Dr. Donna May D. Papa, the “Bacteriophage in Food Safety: Biosensing and Biocontrol of Food Pathogens” program is composed of two component projects which are both now in their second year of research implementation.

The first project, led by Dr. Bergantin Jr., focusing on detecting bacteria in food, has already completed the preparation of bacteriophages against *Salmonella* spp. and *Listeria monocytogenes* for further research activities on the development of the biosensor, such as the optimization of study parameters including the incubation time, washing step, and phage concentration.

As explained by Dr. Bergantin Jr., BPs can be used in biosensing where they serve as bioreceptor to attract bacteria, which will then be measured using an electrode, same with what is used in a blood glucose meter. The results can be obtained within 30 minutes.

Further, the second project led by Papa, which focuses on controlling or killing

Mga pathogen na madalas na nakikita sa hilaw na karne at processed meat



Salmonella enterica



Listeria monocytogenes

bacteria in food, has already isolated the specific strains of *Salmonella* and *Listeria*, which will be used in formulating BPs.

Dr. Papa said that resulting BPs can then be applied or sprayed as a solution to a wide variety of food such as raw meats, ready-to-eat food, poultry, and fresh fruits and vegetables. She said that because BPs target specific bacteria, applying these to food will have no effect in its overall appearance, taste, and smell.

On the other hand, DOST-PCHRD Executive Director Dr. Jaime C. Montoya said that BPs can be imagined as an injection, which pricks the bacteria until it dies.

“Use of bacteriophages is gaining popularity over the world because according to studies, by using bacteriophage, bacteria cannot develop resistance,” he added.

Dr. Papa also seconded this and said that in contrast, current practices involve using antibiotics, which definitely has effects when consumed by humans.

She added that their study focuses on the *Salmonella* spp. and *Listeria monocytogenes* but the method can be replicated to target other pathogens, and

can be extended from the food industry, though not limited, to aquaculture and agriculture.

She also said that they are currently done with the stability testing to varying temperatures and were able to choose the best stability for the method.

For Dr. Bergantin Jr., the program aims to help contribute to the reduction of foodborne diseases and food poisoning by ensuring food safety. It is also seen as a big contribution to the economy, as a whole, because this will help ensure that food prepared by small business as well as the ingredients used in bigger industries are not easily contaminated.

In his message, DOST Sec. Renato U. Solidum Jr. expressed his support to the project.

“Indeed, health is wealth. And through the help of science, we at DOST can make it happen. *Lagi po nating tandaan na: “Sa siyensiya at teknolohiya, kalusugan ay sisigla,”* he said.

The initiative is allocated with a total of PHP 9,895,456.72 funding support and is among the 11 projects under the DOST-PCHRD’s Nutrition and Food Safety Program.

DOST taps water refilling stations to help resolve Pinoys' low iodine consumption through “*Tubig Talino*”

By Geraldine Bulaon-Ducusin, DOST-STII

In response to the reported inadequate iodine intake of Filipinos as reflected in the results of the Department of Science and Technology’s Food and Nutrition Research Institute (DOST–FNRI)-Expanded National Nutrition Survey in 2021, DOST–FNRI developed a technology for iodine-rich drinking water or “*Tubig Talino*.”

DOST-FNRI continuously transfers this to qualified adoptors, like operators of water refilling stations, to help combat iodine deficiency.

Drinking five glasses of “*Tubig Talino*” at 250 milliliters (mL) each can meet 33% of the daily iodine requirement of the body.

The survey revealed that only about one-third or 33.2% of household respondents consumed iodized salt with sufficient iodine, while around one out of two or 55.7% claimed using it.

Iodine deficiency causes significant problems from birth, jeopardizing children’s mental health and physical development, affecting their performance and competency, or worse, their survival, according to the World Health Organization (WHO).

The WHO further warned that iodine deficiency in pregnant women can harm the baby in the womb, resulting in neuro-developmental deficits, low birth weight, prematurity, and can increase perinatal and infant mortality.

The Department of Health, through the Food and Drug Administration, sets and enforces standards for iodized salt and monitors compliance of salt manufacturers and distributors

to ensure that the salt being sold in markets and retail stores is properly iodized.

“*Tubig Talino*” is a combination of purified or ordinary potable water and Water Plus I2, a water and iodine premix. Only 5 mL of Water Plus I2 can enrich 19 liters of purified or potable drinking water.

Five years ago, the 8th NNS already reported that one of the interventions that can be considered effective in the control of iodine deficiency disorder (IDD) in the Philippines is the countrywide salt iodization program.

However, cost-effectiveness of this program was said to be dependent on the amount of iodine in the salt that reaches the consumers at the household level and the salt intake of the households.

Based on then self-reported non-usage of iodized salt, 40.6% of them said that iodized salt has a different taste from ordinary salt and/or that they were used to using ordinary salt.

DOST-FNRI noted the respondents’ feedback on the difference in taste between the iodized and ordinary salt and addressed this in the latest DOST developed “*Tubig Talino*”, which is said to have no discernible taste difference from regular water. It can also be used in coffee, tea, milk, other beverages, and even in cooking.

“*Tubig Talino*” can also be used in nutrition intervention programs, disaster relief packs, and other health and community projects.

For those who are restricted to consume salt, like people with hypertension and kidney disease, DOST-FNRI recommends eating iodine-rich foods instead such as fish, shellfish, and other seafood to avoid IDD.

The government, through the Republic Act No. 8172, known as “An Act for Salt Iodization Nationwide (or ASIN),” declared the policy of the state to protect and promote the health of the people, to maintain an effective food regulatory system, and to provide the entire population, especially women and children with proper nutrition.



DOST-Region VII and LGU collaborate, provide 24-hour water supply to residents of Siquijor

By Macbeth S. Dal, DOST-Siquijor PSTC



Barangay Pangi's meeting with the officials and residents prior to the scheduled inauguration of the newly installed water system.



A water filtration system for a safe water source of the *barangay*. The water can be safely consumed with the same value as the commercially available purified water.

Barangay Pangi in Siquior used to have the same problem that some of the residents in Metro Manila areas continue to suffer –the limited supply of tap water to be used by households and establishments.

Most residents had to sleep late at night to wait for scheduled water service and collect enough for the following day's consumption. Sometimes, they have no choice but to collect rainwater to be used for household chores such as toilet cleaning and laundry.

To meet the 24-hour water supply needs of *Barangay* Pangi residents, the local government of Siquijor solicited the assistance of the Department of Science and Technology Region 6 Office (DOST-VI) and they signed a joint Memorandum of Agreement for the project titled "Science and Technology Support for the Upgrading of Water Supply in *Barangay* Pangi, Siquijor to Enhance Water Quality and Distribution Capacity" through its Grants-in-Aid Program.

DOST-VII conducted a Technology Needs Assessment (TNA) in 2021 to determine appropriate interventions needed to increase the water supply, and with the results of the TNA, DOST-VII provided the following technological

intervention: the installation of a solar-powered water pumping station as a backup during the day and during power outages, a water filtration system to make the water safe for drinking by economically disadvantaged households, an additional water storage system, and trained personnel to oversee the project.

Prior to the project, the Metro Siquijor Water District, the local water supplier, has limited water sources that cannot supply the entire municipality of Siquijor. With this, the residents of *Barangay* Pangi longed to enjoy sufficient, if not abundant, water supply like the other areas in the province.

The solution came when the local government unit (LGU) of Siquijor learned of the *barangay's* water needs and since Pangi has a good underground water source, the officials set aside a couple of million pesos to extract water. They devised a method of extracting water from deep wells using electric power pump and stored it in a tank.

The project made life easier for the residents who now enjoy a steady water supply for their daily needs. However, the water pump's capacity is only good for three hours of operation, the same as the tank capacity. But this intervention has

already improved the water situation in the community, and there is still more to be done.

The DOST-LGU project was completed in December 2022, and the water system is now capable of supplying water to the community around the clock, and it will soon serve an additional number of households in neighboring *barangays*.

A sufficient supply of water made life easier for the residents of *Barangay* Pangi and improved their health and sanitation condition. Life indeed cannot exist without water, and it gets better with safer and easily accessible water supply.

Barangay Pangi is known to be the biggest *barangay* in the province in terms of population and land area. It is home to an estimated 300 households as well as public and private establishments, from hospitals to funeral homes.

NEDA recognizes DOST-PCHRD for successful implementation of HeaRTNovation Hubs

The National Economic and Development Authority (NEDA) recognized the Department of Science and Technology–Philippine Council for Health Research and Development (DOST-PCHRD) for the successful implementation of the HeaRTNovation Hubs (H-Hubs) Program during the National Innovation Day celebration last 28 April 2023 at the Philippine International Convention Center in Pasay City.

Funded under NEDA's 2022 Innovation Grant, the establishment of the H-Hubs aims to

provide an environment that will support innovators from health institutions in developing their technologies and in linking them with potential partners for eventual transfer, adoption, or commercialization. It is an expansion of the currently implemented TEKI (Technology Transformation and Empowerment of Knowledge Generators and Innovators) in Health Program.

The DOST-PCHRD is currently conducting H-Hub's first call for proposals from Filipino-owned hospitals, academic or health institutions, and member institutions of Regional Health Research and Development Consortia. Successful grantees under the program may avail of the following services: 1) grant funding for the design and implementation of health-focused pre-commercialization support programs for research innovations, 2) capacity building and information dissemination activities, and 3) networking and matching events.

DOST-PCHRD's lead for the Intellectual Property and Technology Management (IPTM) unit, Joana America, explained how the program aims to encourage Filipinovation in health: "For this program, we recognized the need to sustain the momentum of health technology innovations noted during the pandemic. The grant program will help support the establishment of the H-Hubs that will facilitate the

pre-commercialization activities of health innovations for eventual commercialization and contributing to the overall goal of a healthy Filipino nation."

For his part, DOST-PCHRD Executive Director Dr. Jaime C. Montoya said, "We are grateful to NEDA for supporting our vision of advancing technology transfer in the field of health research." "Consistent with our mission of making lives better for the Filipino people, it is our hope that through programs such as the H-Hubs, we can make sure that R&D initiatives in health are eventually translated to serve the needs of our communities," he added.

Interested applicants for H-Hubs may submit an intent letter of application to iptm@pchrd.dost.gov.ph addressed to DOST-PCHRD's executive director. Applications should be submitted on or before 31 May 2023.



Gov't service devolution to LGUs key to universal health care in PH, says experts

By Allyster A. Endozo, *DOST-STII*

Photos by Teddy A. Amante, *DOST-STII*

Implementation of a universal health care system in the Philippines may come to fruition with the issuance in June 2021 of Executive Order No. 138, which paves the way for devolution of health and other public services from the national government to local government units (LGUs).

For this strategy to work, Ernesto D. Garilao, Chairperson of the Zuellig Family Foundation (ZFF), recommended capacitating local officials through leadership training, incentivizing LGUs to collaborate with the private sector, and developing policies to ensure stakeholder inclusivity.

Garilao cited ZFF's Health Change Model involving 744 municipalities and 18 provinces across the country, which brought about downward trends in the prevalence rates of child stunting and wasting—particularly in Sarangani, Northern Samar, Samar, and Zamboanga del Norte.

On the other hand, Dr. Lahaina Gabriel-Bulaong, President of the Association

of Municipal Health Officers of the Philippines Bataan Chapter, shared that strong political will and motivation of local leaders were crucial to their success in improving the health system for the people of Dinalupihan, Bataan.

Progress includes the construction and renovation of health facilities at par with Department of Health (DOH) standards, attainment of an acceptable facility-population ratio, and creation of a functional surveillance unit that referred 74% of constituents via PhilHealth's *Konsulta* package.

Backed by his experience as the Provincial Health Consultant of Tarlac, Dr. Ricardo P. Ramos proposed a two-track level at the DOH National Central Office—high spending on health promotion and prevention in tandem with the treatment and rehabilitation of critical illnesses.

Ramos advocates greater focus on the family, which he said is “almost lost in oblivion” during policy discussions. “The parents have to be given the adequate knowledge [and] skills to push them to

an attitude that will ensure the healthy well-being of the family and society in general.”

The experts presented their program results and policy recommendations on Day 1 of the Luzon Regional Scientific Meeting (RSM) held from 17–18 May 2023 in Baguio City and hosted by the National Academy of Science and Technology's (NAST) Health and Social Sciences Divisions of the Department of Science and Technology (DOST).

The Luzon RSM, organized by NAST in cooperation with the DOST–Cordillera Administrative Region Office, also highlighted the latest outputs of research centers and higher education institutions through the scientific poster session.

Resolutions generated from the discussions will be consolidated and presented during the 45th Annual Scientific Meeting, which was held from 12–13 July 2023 in Manila under the theme “Science and Technology for Democracy (*Agham at Teknolohiya para sa Demokrasya*).”



Presenters during the afternoon session on Day 1 of the Luzon Regional Scientific Meeting from 17–18 May 2023 in Baguio City (from left to right): Ernesto D. Garilao, Chairperson of the Zuellig Family Foundation; Dr. Lahaina Gabriel-Bulaong, President of the Association of Municipal Health Officers of the Philippines Bataan Chapter; and Dr. Ricardo P. Ramos, Provincial Health Consultant of Tarlac.

DOST-CALABARZON, ITDI, BatStateU deploy UPEDS technology to address arsenic contamination in drinking water in Agoncillo, Batangas

By John Maico M. Hernandez, DOST-STII

The Department of Science and Technology (DOST)-CALABARZON, through its Provincial Science and Technology Office in Batangas (PSTO-Batangas) in partnership with the DOST-Industrial Technology Development Institute (ITDI) and Batangas State University (BatStateU), deployed the Upgraded Emergency Disinfection System (UPEDS) technology to address arsenic contamination in drinking water at Sitio Mahabang Gulod, Brgy. Barigon, Agoncillo, Batangas last 03 April 2023.

UPEDS is a technology developed by DOST-ITDI, which aims to remove arsenic from a water source and make it safe for drinking. This technology is a batch-type, mobile, ready-to-use water treatment system with an integrated solar panel that provides a reliable and uninterrupted power supply that can be used in areas where calamities have disrupted or cut off electricity and water supplies. The unit can treat up to 170 liters of water per tank/cycle.

Arsenic contamination in groundwater was first detected in Agoncillo and neighboring towns after the eruption of Taal Volcano on 12 January 2020. The alarming elevation of arsenic levels in drinking water among eight towns and a city in the province of Batangas is linked to Taal Volcano's activities. Through the deployment of UPEDS, the community in *Barangay* Barigon can now access clean potable water.

Present during the deployment activity were DOST-CALABARZON Regional Director Ms. Emelita Bagsit, DOST-ITDI Chief for Environmental and Biotechnology Division Engr.



Reynaldo L. Esguerra, PSTO-Batangas Provincial S&T Director Ms. Felina C. Malabanan, BatStateU President Dr. Tirso A. Ronquillo, BatStateU Vice President for Research, Development and Extension Services Engr. Albertson D. Amante, Agoncillo Municipal Mayor Atty. Cinderella V. Reyes, Vice Mayor Daniel D. Reyes, Brgy. Captain Magno Humarang, and the project team composed of Engr. Rochelle Retamar, Engr. Prima Joy Margarito, and Engr. Dante Vergara.

According to Director Bagsit, this is the first UPEDS deployed in the CALABARZON region, and she has high hopes for the benefits this unit could provide to the residents of Brgy. Barigon. She also stressed the importance of proper maintenance and utilization of the UPEDS to ensure its sustainability and maximize its impact on the community.

A demonstration of chemical preparation and on using the equipment was

conducted as part of the deployment program. The project team spearheaded the equipment operation, which they mentioned would need at least 30 minutes to treat the water and make it available for consumption.

Brgy. Captain Humarang thanked DOST-CALABARZON, DOST-ITDI, BatStateU, and LGU-Agoncillo for the deployment of this technology. Since the majority of their residents buy drinking water from nearby *barangays*, he considers this technology advantageous in making potable water available in their community.

DOST-CALABARZON is one of the regional offices of the DOST and is located at Jamboree Road, Brgy. Timugan, Los Baños, Laguna. For more information, you may visit us on Facebook at facebook.com/dostcalabarzon or website www.region4a.dost.gov.ph. You may also reach us at parcu@ro4a.dost.gov.ph.

DOST ReDMaTCH to find solutions for childhood stunting, pediatric dengue, and postpartum depression



The Davao Medical School Foundation, Inc. showcased its 32 million peso worth of state-of-the-art equipment funded by the Department of Science and Technology (DOST) for the R&D Center for Maternal and Child Health (ReDMaTCH) during the school's Research Week activity.

DOST-XI S&T Information and Promotion

Davao Medical School Foundation, Inc. (DMSFI) and Philippine Genome Center Mindanao (PGCMin) have joined forces to address the pressing healthcare challenges faced by mothers and children in Mindanao. This partnership was formed through the Department of Science and Technology (DOST) R&D Center for Maternal and Child Health ReDMaTCH.

This innovation center is one of the Niche Centers in the Regions for R&D or NICER in Mindanao, that aims to tackle major health issues through metabolomics, microbiome studies, metagenomics, and bioinformatics analysis. By leveraging their expertise and cutting-edge facilities, PGCMin and DMSFI aim to enhance access to quality healthcare services for mothers and children, preventing untimely deaths and improving overall well-being.

Under the leadership of Dr. Genevieve Tupas, the ReDMaTCH project will tackle three primary health problems in the region: childhood stunting, pediatric dengue, and postpartum depression. By identifying biomarkers for childhood stunting and examining the association of risks between mothers and children for severe dengue, the project aims to enhance knowledge, develop appropriate interventions, and contribute to finding solutions. Furthermore,

studying postpartum depression among Filipino mothers will enable early diagnosis and the implementation of targeted interventions.

The center is already making progress in its mission. Currently, ReDMaTCH is training 10 senior high school students, 30 medical students, and two pediatric residents. This training will equip the next generation of healthcare professionals with the skills and knowledge needed to address maternal and child health challenges effectively.

In addition to the training initiatives, ReDMaTCH has secured a significant milestone by signing a MOA with the municipal mayor of Caraga, Davao Oriental. The Memorandum of Agreement signifies the commitment of the center to collaborate with local authorities and communities to implement impactful healthcare interventions. This partnership will contribute to the overall success of ReDMaTCH and its efforts to improve the health outcomes of mothers and children in Mindanao.

Dr. Joel Hassan Tolentino, Program Director of PGCMin, expressed enthusiasm for providing the necessary resources to implement this program, envisioning increased opportunities and advancements for the people of Mindanao, particularly mothers and children.

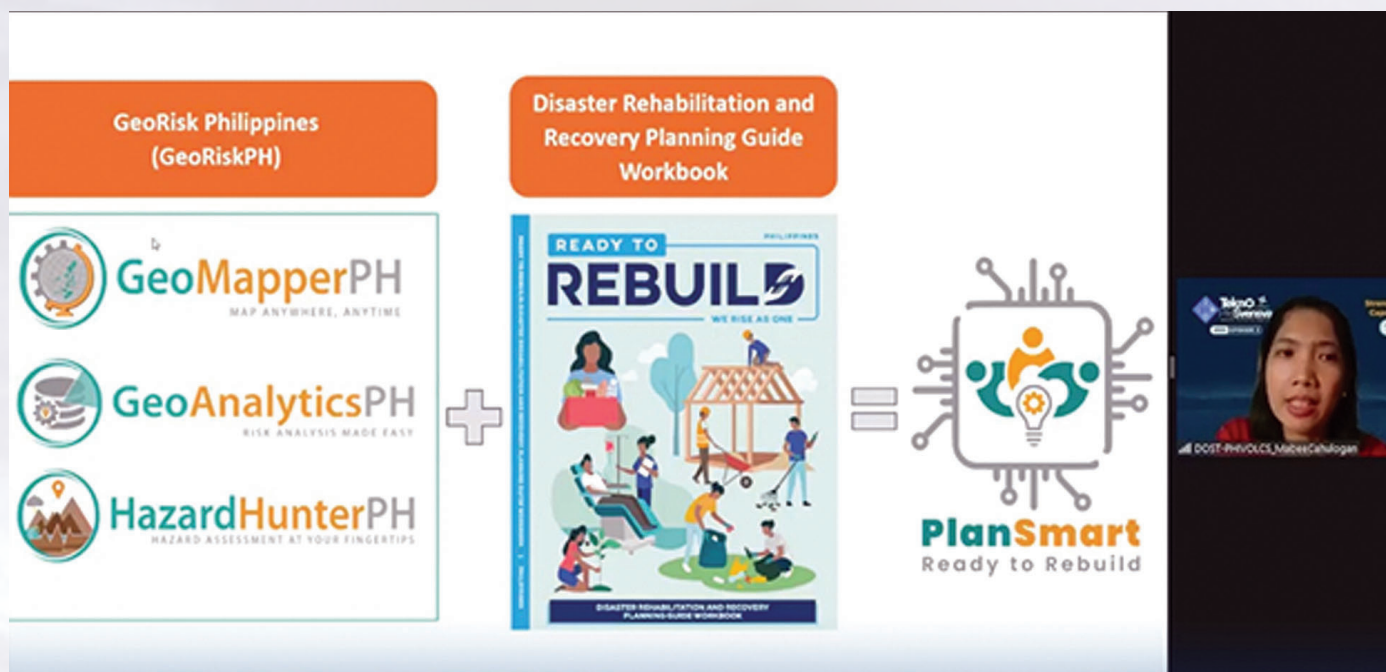
Through this collaboration, the PGCMin facility will serve as a hub for implementation, offering training, consultation, and genomics-related laboratory services. Dr. Lyre Anni Murao, UP Mindanao Chancellor, expressed optimism for the partnership, highlighting the potential for opportunities and developments that will contribute to the advancement of science and technology in Mindanao, ultimately creating a brighter future for all.

Through the substantial PHP 75 million approved funding from DOST, ReDMaTCH has acquired PHP 32 million cutting-edge equipment, including Quadrupole Time of Flight Liquid Chromatography Mass Spectrometry and Andrew Pipetting Robot, during the school's Research Week activity. This investment allows the center to conduct higher-level studies like metabolomics, enabling comprehensive analyses vital for addressing maternal and child health challenges effectively.

The collaboration between DMSFI, PGCMin, and DOST underscores a commitment to advancing research and innovation in maternal and child health. Through their combined efforts, they aim to make significant strides in addressing health inequalities and improving the lives of mothers and children in Mindanao.



**WEALTH
PROTECTION**
Strategy Framework



DOST-PHIVOLCS' GeoRiskPH aims to strengthen disaster risk capability of Ilocos Region – DOST-I

By Christian Dominic I. Casimiro, DOST-I

The Department of Science and Technology Region 1 Office (DOST-I) recently conducted a webinar on Disaster Risk Reduction and Management (DRRM) through its *Tekno Presyensya: Syensya ken Teknolohiya para kadagiti Umili* 2023 Episode 3: Strengthening DRRM Capacities through GeoRiskPH, via Zoom and streamed live via the DOST-I Facebook Page.

In collaboration with the DOST–Philippine Institute of Volcanology and Seismology (PHIVOLCS), the region is heightening its capabilities to prepare and respond to geological risks amid the recent earthquakes in northern Luzon. Mabelline T. Cahulogan, Supervising Science Research Specialist, presented GeoRiskPH as a digital tool for disaster managers and local government units (LGUs) to use. GeoRiskPH is a government-led multi-agency initiative to serve as a central information resource on natural hazards and risk assessment.

In line with the safety measures against geological hazards, GeoRiskPH aims to determine and assess areas in the country that are safe or vulnerable or prone to geological hazards like ground fracture, liquefaction, tsunami, and flooding. One product under GeoRiskPH is the digital tool called HazardHunterPH, which is used to generate indicative hazard assessment reports on the user's specified location. It also has a climate projection from the DOST-Philippine Atmospheric, Geophysical and Astronomical Services Administration (DOST-PAGASA) wherein rainfall estimates, temperature, and other information are provided already.

Furthermore, presented also during the program was the PlanSmart, Ready to Rebuild, which can auto-generate a planning document in no time instead of creating it for weeks or months which is also helpful for the LGUs to

create their rehabilitation and recovery plans. Moreover, the capacities of the GeoRiskPH's platforms: GeoMapperPh, GeoAnalyticsPH, HazardHunterPH plus the Disaster Rehabilitation and Recovery Planning Guide Workbook are all integrated in PlanSmart, Ready to Rebuild.

All these features and many more are all provided by GeoRiskPH. As Cahulogan said, let's always be ready for any natural hazards through our government's resources like HazardHunterPh. Truly that "safety is our top priority" and "*Handa ang may alam.*"

For more information about GeoriskPH, you may check their website www.georisk.gov.ph. You may reach them at +63 8426-1426 to 79 and via email, georisk@philvolcs.dost.gov.ph.



Exposure Data Mapper

Situation Data Mapper

Credentials are needed to ensure data security, data integrity and user accountability. Database managers are required for all group accounts.

10:35:20

Generating Multi-hazard assessment for the Provincial Capitol of Negros Oriental

DOST-PHIVOLCS

DENR-MGB

10:37:11

The first in the region: Copernicus–Philippines and EU join forces for better response to natural disasters and climate change



Present at the launch are EU International Partnerships Director for Asia, Central Asia, and Middle East Peteris Ustubs, EU Ambassador Luc Vero, DOST Secretary Renato U. Solidum, Jr. Philippines Space Agency Director–General Joel S. Marciano, Jr. and other government, CSO, private and key stakeholders.

Officials from the Philippine Space Agency, the Department of Science and Technology (DOST), and the European Union (EU) launched on 24 Apr 2023 the Copernicus Capacity Support Action Programme for the Philippines (CopPhil) worth approximately PHP 610 million or EUR €10 million.

The first space cooperation programme in the region, this new initiative will help Philippine authorities develop national systems to make use of EU’s earth observation’s satellites data in the country’s disaster mitigation and climate change adaptation and food security strategies.

The EU’s earth observation flagship programme, Copernicus provides free

environment and climate data derived from a constellation of satellites –the Sentinels–which monitor the earth and its many ecosystems 24 hours daily. This free information aims to help public authorities, businesses, and international organisations mitigate climate change impacts and build a sustainable future for all.

In the Philippines, Copernicus’ satellite images have already helped authorities monitor the situation of remote communities in the aftermath of typhoons like Odette or accidents like an oil spill to help authorities implement their disaster preparedness plans and mitigation programmes.

The launch of CopPhil featured a line-up of high level national and international

speakers from the Philippine Government, academia, industry, and space agencies, as well as representatives from the European public sector and space agencies from Austria, Italy, Greece, Spain, Germany, France, and Romania, and from the European Space Agency (ESA).

During the launch, DOST Secretary Renato U. Solidum Jr. welcomed Copernicus and the Copernicus programme in the Philippines as “a long-awaited cooperation on an innovative system that will provide the Philippines new opportunities to develop earth observation applications for disaster risk reduction and management, environmental protection, and climate change adaptation.”

Philippine Space Agency (PhilSA) Director General Joel S. Marciano Jr. said that “the Agency welcomes this partnership with the European Union as it strengthens the domestic space value chain, particularly the ability to process and use satellite images and spaceborne data to better manage, and protect our environment and natural resources, and be better prepared in the face of disasters and climate change.”

H. E. Luc Véron, EU Ambassador to the Philippines, said that “the Copernicus programme for the Philippines is a pioneer initiative in Asia and Asia Pacific and a starting point for a larger program on digital connectivity. The programme will enhance capacities for a stronger and more shock-resilient Filipino economy and society.”

“In the long term, the European Union is exploring the possibility to create a network of Copernicus partners in the ASEAN region aside from other parts of the world. The uptake of innovative technologies such as Copernicus will trigger growth, jobs, and modernization of digital infrastructures that can be used in many sectors in the Philippines,” Ambassador Véron said.

Background

The launch of CopPH was supported by the European Commission’s Technical Assistance and Information Exchange Instrument. The Instrument promotes peer-to-peer interactions and technical exchanges between EU Member States’ public administrations and those in partner countries.

Copernicus is an EU Program aimed at developing European information services based on satellite earth observation and *in-situ* (non-space) data.

The Program is coordinated and is managed by the European Commission. It is implemented in partnership with the EU Member States, the European Space



DOST Secretary Renato U. Solidum, Jr. during the press conference.

Agency, the European Organisation for the Exploitation of Meteorological Satellites, the European Centre for Medium-Range Weather Forecasts, EU agencies and Mercator Océan.

The Copernicus Services deliver near-real-time data on a global level which can also be used for local and regional needs, to help us better understand our planet and sustainably manage the environment we live in. Copernicus data support countries worldwide in their efforts to comply with the targets set in the Paris Agreement’s Nationally Determined Contributions. For more information, visit <https://www.copernicus.eu/en>.



EU delegation to the Philippines.

For information or questions on Copernicus technologies and the EU-funded National Copernicus Capacity Support Action Programme please contact:

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DOST, MSU-IIT introduce foam innovation to clean up oil spill

Department of Science and Technology (DOST) *Balik Scientist* featured a foam technology to solve oil spills.

In an event held on 11 May 2023 by the Mindanao State University–Iligan Institute of Technology (MSU-IIT), a bio-based polyurethane foam labeled as “CocoFlexSorb” was presented to the public. This technology, unlike those available in the market, has superior oil absorption capacity and can absorb different types of used oil from light, vegetable, kerosene, engine, and bunker oil.

The CocoFlexSorb may also be reused forty 40 times and is not harmful to the environment.

During field tests held at Occidental Mindoro last May 2023 with the Philippine Coast Guard, the project showed promising results, indicating that this technology could be a solution to an oil spill problem. However, further testing and development are necessary before the technology can be adopted and commercialized.

“DOST is very proud of the accomplishments of MSU-IIT with its collaborative efforts with industry,” said DOST Secretary Renato U. Solidum Jr. “The DOST is steadfast in driving the industry through continuous R&D to enable technological advancement. Innovations like the CocoFlexSorb provides options for a better life to Filipinos like clean water and a healthy environment,” he added.

This technology is developed from the DOST–Niche Centers in the Regions for R&D (NICER) program Center for Sustainable Polymers at the MMSU-IIT. The inaugurated innovation center showcased three product lines.

The first is the rigid insulation foam panels, designed specifically for the building and construction industry,

targeting the segment that prioritize sustainable and eco-friendly materials. It is the first of its kind to use polyol derived entirely from coconut oil, without any petroleum-based substitutes.

The second is the viscoelastic foams, a bio-based alternative to commercially available “memory” foams. This product has higher density than conventional foams and possesses the signature feature of memory foams—slow recovery.

The third is the superoleophilic foams that showed potential to absorb numerous types of oil. The material has been proven to have high affinity and sorption capacity in bunker oil, fresh and used engine oil, kerosene, and vegetable oils. It is hydrophobic in both fresh and salt water and has superior reusability as its oil sorption capacity does not diminish with use.

Pushing for sustainability as one of its strategies, the DOST continuously funds universities like MSU-IIT to through the NICER Program to capacitate higher education institutions in the regions and make significant improvement in regional research by integrating its development needs with the existing R&D research capabilities and resources. It will provide institutional grant for R&D capacity building to improve their S&T infrastructure.

“The development of eco-friendly and cost-effective polymers derived from natural sources shows promise



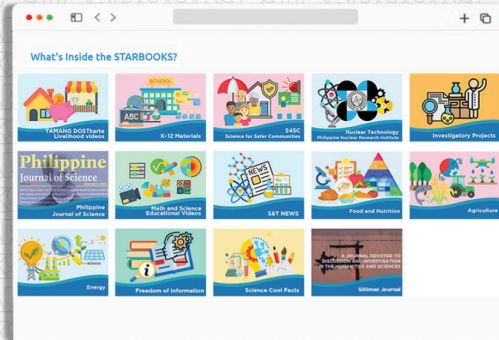
DOST Secretary Renato U. Solidum Jr. holds up a crude oil soaked CocoFlexSorb—a foam technology developed by the Mindanao State University–Iligan Institute of Technology that can absorb different types of oil, with reuse capacity of 40 times. DOST Usec. Leah J. Buendia holds a clean pack of the technology.

in mitigating the impact of oil spills. With this achievement, we hope to inspire researchers to continue investing in innovative technologies and collaborations to work towards a cleaner and healthier environment,” said Dr. Arnold A. Lubguban, DOST *Balik Scientist* and Project Leader of MSU-IIT’s Center for Sustainable Polymer.

On the other hand, DOST Undersecretary for R&D Leah J. Buendia said, “We need to develop the country’s innovation and entrepreneurial ecosystem through linkages between academe, industry, and government. This translates to upgrades in products and services in our local companies. The breakthroughs in MSU-IIT is the perfect example of harmonizing our resources combined with the support given to our Filipino scientists.”

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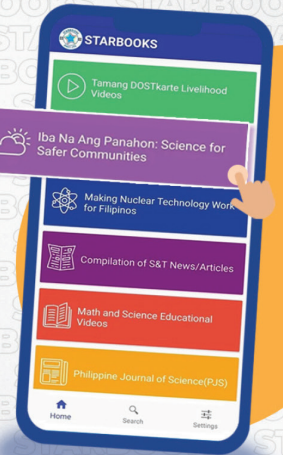
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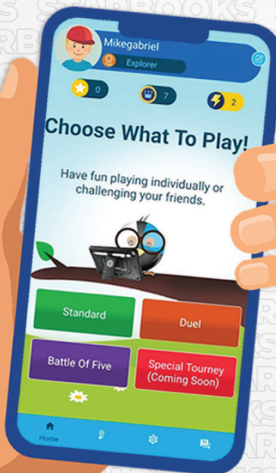
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