

# 20

**in**

# 2020



**DEPARTMENT OF  
SCIENCE AND  
TECHNOLOGY**

$$\sin x = a; \quad x = (-1)^n \arcsin a + \pi n,$$

$$\operatorname{tg}^2 \alpha + 1 = \frac{1}{\cos^2 \alpha} = \sec^2 \alpha$$

$$\sin x = a; \quad x = (-1)^n \arcsin a + \pi n,$$



## About the Catalogue

The “20 in 2020 Technology Catalogue” contains relevant information on 20 programs, services, activities, and research and development (R&D) projects that are being implemented and funded by the different attached agencies and regional offices of the Department of Science and Technology.

These 20 programs, services, activities, and R&D projects encompass a wide range of fields where science, technology, and innovation can make a big difference in the country’s socioeconomic development. The areas covered in this catalogue are health and nutrition, microsatellite development, convergence of art and science, textile, weather monitoring, tissue culture planting, transportation, rural development, and science education.

## Message from the Secretary

Technology remains the driving force of any economy. If our country is to join the ranks of advanced nations that have leap-frogged into the new millennium using science, technology, and innovation as the catalysts of change, we have to develop more practical technologies that can help improve people's lives.

This is the reason why this administration has set forth its mission to spur economic development for inclusive growth by maximizing the use of locally developed technologies in the areas of agriculture, health, enterprise development, emerging industries, information and communication technology, artificial intelligence, nanotechnology, disaster risk reduction and management, and human capital development.

Thus, the Department of Science and Technology (DOST) would like to kick off the year 2020 by featuring 20 of our programs, services, activities, and R&D projects that we believe can make a big impact in the lives of our people and push our country to attain socioeconomic growth and development.

This catalogue of programs and local technologies developed or funded by DOST serves as a communication platform to promote our own innovations so that more of our people can use them to their advantage.

What good will our technologies and inventions be if they remain locked in our laboratories? We need to make them known to everyone. By making our locally developed technologies easily available off the shelf, we will be able to encourage more to embrace a culture of science.

We in the government have that responsibility to provide the best service to every Filipino so that as a nation, we will achieve inclusive and sustainable growth and development.



FORTUNATO T. DE LA PEÑA

Secretary



## Message from the Undersecretary for Research and Development

In the 2019 Global Innovation Index (GII) report, the Philippines jumped by 19 notches to rank 54th, thus marking the biggest leap among the Southeast Asian nations. We overtook Brunei to move up in the fifth rank among the eight ASEAN member countries in the GII, beating Indonesia and Cambodia.

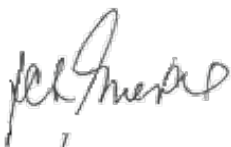
This notable improvement in our innovation index ranking indicates that it is imperative for us to focus our sights this year 2020 to do more research and development to come up with scientific solutions to our socioeconomic problems so that our country can move forward at a faster rate.

Through this technology catalogue, I hope that more Filipinos will be aware of the many local technologies, innovations, and inventions that the Department of Science and Technology (DOST) has developed. This way, our Filipino farmer-entrepreneurs, investors, and other stakeholders are informed of our knowledge products and services that they can adopt and make use to improve their productivity, competitiveness and way of life.

I count on the support of our friends in the media to share to our fellow countrymen these programs, technologies, and innovations that are meant to better the lives of every Filipino.

You can find in this technology catalogue 20 programs, services, activities, and R&D projects with practical applications and potential for business and job creation.

The DOST hopes that all of these programs, projects, innovations, and technologies can serve as instruments in promoting science, technology, and innovation in all strata of society.



DR. ROWENA CRISTINA L. GUEVARA  
Undersecretary for Research and Development



## Message from the Undersecretary for Regional Operations

Advancement in technology has been shaping and reshaping economies – from the time of the Industrial Revolution of steam engines and printing press to the dawning of the 4th Industrial Revolution. With the emergence of disruptive technologies such as the artificial intelligence, augmented reality, robotics, and internet of things, the world has certainly become more sophisticated, and smaller because of greater interconnectedness.

Is technology good? Well, over the years, we have seen how advancements in various areas like food security, health management, business enterprise development, and alternative energy have made positive impacts on our lives. Undoubtedly, science and technology had consistently provided and offered solutions and made our lives easier and more comfortable.



In this technology catalogue, we feature 20 programs, services, activities, and R&D projects that can provide solutions to our socioeconomic problems, particularly in the provinces and regions where they are needed most. I believe that the technologies featured here, when adopted, will help level the playing field for our people in the countryside and enable them to attain inclusive growth and development.

These technologies can very well serve as equalizers that will help spur economic development in the regions. Through these technologies, we hope to help local farmers, fisherfolk, and micro, small, and medium enterprises improve their productivity, product quality, and competitiveness both in the domestic and international markets.

This technology catalogue features incredibly useful technologies that are products of the beautiful minds and exceptional efforts of Filipino scientists, researchers, engineers, inventors, and innovators. We honor them and their works through this catalogue.

We urge the Filipino people to adopt and take advantage of these technologies. Let us support our local scientists, researchers, engineers, inventors, and innovators!

Mabuhay!

A stylized, handwritten signature in black ink, appearing to be 'Brenda L. Nazareth-Manzano'.

BRENDA L. NAZARETH-MANZANO, CESO I  
Undersecretary for Regional Operations

## Message from the Undersecretary for Scientific and Technical Services

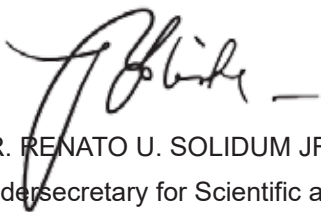
With its commitment to vigorously advance science, technology, and innovation of Filipino-owned companies, universities and Research and Development Institutes, as indicated in the Philippine Development Plan 2017-2022, the Department of Science and Technology (DOST) supported the development of various local technologies in the areas of agriculture; health, food, and nutrition; education; aerospace; industry and enterprise development; and, disaster risk reduction and management; among others, that contributed to the Philippines' performance based on the Global Innovation Index (GII).

Aside from the remarkable improvement in the ranking of the Philippines in the GII from 73rd in 2018 to 54th in 2019, it is also notable that the Philippines scored above average in almost all innovation dimensions which includes knowledge absorption (from rank 32 in 2018 to rank 14 in 2019); innovation linkages (from rank 93 in 2018 to rank 71 in 2019); and university/industry research collaboration (from rank 56 in 2018 to rank 25 in 2019).

To showcase the locally developed technologies supported by the Department and to increase awareness on its programs' benefits, the DOST packaged this technology catalogue, "20 IN 2020 TECHNOLOGY CATALOGUE". This compilation features programs and technologies developed by our scientists, researchers, engineers, inventors, and innovators that have positive impact on the people's lives.

With this catalogue, we hope to encourage more Filipinos to take advantage of these locally developed technologies and to inspire more Filipino scientists, researchers, engineers, and inventors to engage further in science, technology and innovation.

I invite all of you to see this catalogue and share the good news. Local technology works!



DR. RENATO U. SOLIDUM JR.  
Undersecretary for Scientific and Technical Services



# INDEX OF TECHNOLOGIES

Understanding Lightning and Thunderstorms for Extreme Weather Monitoring and Information Sharing (ULAT)	1
Maya-3 and Maya-4: The First Philippine University-Built Nanosatellites	2
2020 Perfect Vision for Nutrition	3
Revival of Bamboo Musical Instruments	4
iLab Ornamental Plants	5
12-HP Single Cylinder Diesel Engine	6
First Fully Automated Gamma Irradiation Facility	7
Regional Yarn Production and Innovation Center (RYPIC)	8
Nationwide Tissue-Cultured Coconut Planting Day	9
Hybrid Trimaran Maiden Voyage	10
Launching of DOST-enabled Smart Cities	11
Biomedical Devices	12
First Anti-Dengue Drug	13
New Facilities for Competitiveness	14
Launching of Science for the People Books	15
Regional Science Discovery Centers	16
HANDA PILIPINAS: Innovations in Disaster Risk Reduction and Response Expo 2020	17
Automated Guideway Transit for Bataan	18
Philippine Genome Center in Visayas	19
BUHAWI Lands in the Navy: DOST-DND Partnership	20





## UNDERSTANDING LIGHTNING AND THUNDERSTORMS FOR EXTREME WEATHER MONITORING AND INFORMATION SHARING (ULAT)

ULAT is a five-year collaborative research and development project aimed at conducting and utilizing lightning and cloud measurements as additional inputs in enhancing the monitoring and forecasting of extreme, short-term localized weather events.

The project is deploying 50 lightning measurement stations in Metro Manila and additional 10 stations in synoptic weather stations of DOST-PAGASA outside of Metro Manila.

ULAT is also establishing a Ground Receiving Station (GRS) in Dumangas, Iloilo to provide additional capability in communicating with the Philippine microsattellites. The Iloilo GRS is equipped with a 3.5 meter satellite tracking antenna and serves as redundancy to the existing ground stations in Quezon City and Davao City.

### Project Cost:

PhP 53M under Japan International Cooperation Agency (JICA) with PhP 32M under DOST-GIA

### Funding Agencies:

DOST-GIA and JICA

### Partners:

- DOST-Region VI
- University of the Philippines Diliman  
-Institute of Environmental Science and Meteorology
- DOST-PAGASA
- Hokkaido University
- JICA
- Japan Science and Technology Agency

### Benefits:

ULAT will enable improved short-term weather forecasting through enhanced observation of weather behaviours by studying torrential rainfall and thunderstorm occurrences, leading to effective risk reduction and disaster mitigation.

**Target Launch Date:** 27 August 2020



### Contact Details:

Juvilyn Castaneda  
juvy@asti.dost.gov.ph /  
Tel. No. 8249-8500 local 1104  
Maria Cristina Manuel  
chichi@asti.dost.gov.ph /  
Tel. No. 8249-8500 local 1412



## MAYA-3 AND MAYA-4

### THE FIRST PHILIPPINE UNIVERSITY-BUILT NANOSATELLITES

The Maya-3 and Maya-4 cube satellites (CubeSats) are the first nanosatellites built within the country. Weighing approximately 1 kg, the CubeSats house components that are designed to demonstrate nanosatellite-based remote data collection system and optical imaging within its 10 cm cubic frame. Maya-3 and Maya-4 are part of the course requirements of the Master of Science/Master of Engineering in Electrical Engineering under the Electrical and Electronics Engineering Institute (EEEI) of the University of the Philippines Diliman (UPD). These are being developed by the first batch of the local nanosatellite engineering graduate program, comprising of eight students with scholarship support from the Department of Science and Technology-Science Education Institute (DOST-SEI).

The local nanosatellite engineering program lodged under the Space Science and Technology Proliferation through University Partnerships (STeP-UP) Project of the Space Technology and Applications Mastery, Innovation, and Advancement (STAMINA4Space) Program, with funding from DOST and co-implemented by UPD and DOST Advanced Science and Technology Institute (ASTI). Maya-3 and Maya-4 are slated for launch in the fourth quarter of 2020.

#### Project Cost:

PhP 20M

#### Partners:

- DOST Science Education Institute (DOST-SEI)
- DOST Advanced Science and Technology Institute (DOST-ASTI)
- Kyushu Institute of Technology

#### Funding Agency:

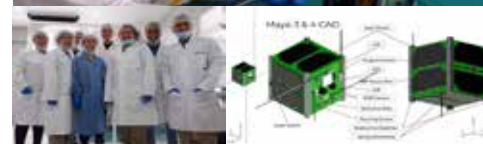
Department of Science and Technology (DOST)

#### Implementing Agency:

University of the Philippines Diliman (UPD) and DOST Advanced Science and Technology Institute (DOST-ASTI)

#### Benefits:

The CubeSats provide local opportunities to acquire space technology know-how through hands-on experience in nanosatellite development. The mission of the nanosatellites is aimed at testing and demonstrating technologies that include, among others, a Store-and-Forward (S&F) capability the enables data from sensors located in remote or hard-to-reach areas to be received and transported to locations where they can be subsequently processed and used. Through its onboard radios and antennas, the CubeSats can also serve the amateur radio community and provide emergency response teams an alternate means of communications.



#### Contact Details:

Engr. Paul Jason Co  
STeP-UP Project Leader  
step-up@eee.upd.edu.ph  
Tel. No. 8981 8500 loc. 3305

Engr. Bryan Custodio  
Maya-3 and Maya-4 Project Manager  
bryan.custodio@eee.upd.edu.ph



## 2020 PERFECT VISION FOR NUTRITION

The Department of Science and Technology-Food and Nutrition Research Institute (DOST-FNRI) eyes its vision for 2020 with NuGen Lab. The program enables new partners to launch IEC materials like the 2020 Menu Guide Calendar. During the program launch, the DOST-FNRI Strategic Plan 2020-2024 will also be unveiled. The plan embodies both organizational and program objectives outlining the strategic direction of the Institute in the next five years. Its theme is "Mobilizing VISION, catalyzing innovations towards high impact food and nutrition R&D programs and S&T services".

The program is also in line with the Whole of Government's Expanded Partnership Against Hunger Program of the Office of the Cabinet Secretary, Malacañang.

### Project Cost:

PhP 8M

### Partners:

- DOST-Regions II, III, NCR
- DOST-PNRI
- BJMP
- Wyeth Philippines, Inc.
- Pilipinas Shell Foundation
- Clinica Manila
- Medical & Health Librarian Association of the Philippines

### Benefits:

The program will strengthen partnership with different sectors, augment resources of DOST-FNRI to boost nutrition improvement efforts, increase public awareness on DOST-FNRI nutrition programs and projects, and provide greater visibility for DOST and FNRI.

**Target Event Date:** 19 February 2020



### Contact Details:

Dr. Mario V. Capanzana  
Director, DOST-FNRI

Tel. No. 8837-2071 to 81 loc 2296



## REVIVAL OF BAMBOO MUSICAL INSTRUMENTS

The versatility of bamboo is showcased in the Bamboo Musical Instruments Innovation Research and Development Program that aims to develop appropriate technological innovations to extend the bamboo's service life for other recreational applications. It is also geared at supporting the inclusion of bamboo musical instruments (BMI) playing in the K-12 curriculum of the Department of Education and production of instruments marimba, angklung, and bumbong by both commercial and indigenous groups. The project is spearheaded by the Department of Science and Technology-Forest Products Research and Development Institute (DOST-FPRDI).

**Project Cost:**

Php 126.6M

**Funding Agency:**

DOST-GIA

**Partners:**

- DOST Region IV-A
- UP Diliman College of Music
- UP Diliman Electrical and Electronics Engineering Institute
- Philippine Normal University
- Philippine Society for Music Education
- Sarita Instrument Artisan
- Dr. Wu Shih-Yin

**Benefits:**

The development of the bamboo musical instruments will revive the BMI making industry through extensive linkages between BMI makers and users and shall increase awareness and appreciation for bamboo musical instrument that is at par with global standards.

**Target Event Date:** 7 July 2020



**Contact Details:**

Aralyn L. Quintos

DOST-FPRDI

Tel. No.: (049) 536-2377



## iLAB ORNAMENTAL PLANTS

The Department of Science and Technology-Region III partnered with the local government unit of Guiguinto, Bulacan for the project entitled “Development of the Gardening and Landscaping Industry of Guiguinto, Bulacan thru the Establishment of an Innovative Tissue Culture Laboratory (iLAB) for Sustainable Propagation of Various Ornamental Plants”.

The project will establish a tissue culture laboratory that will provide the following services:

- Quick generation of identical mature offspring of one plant with desirable traits, which is applicable for commercial large-scale production of plants;
- Production of multiple plants in the absence of seeds or pollinators to produce seeds;
- Production of plants from seeds or stems that may otherwise have low chances of growing;
- Production of novel hybrids and genetically modified plants with improved agronomic traits; and
- Production of plants with greatly reduced chances of transmitting disease, pests and pathogens.

### Project Cost:

DOST III RGIA: PhP 2.79M

LGU Guiguinto, Bulacan: PhP 2.7M

### Funding Agency:

DOST Region III

LGU Guiguinto, Bulacan

**Partner:** LGU of Guiguinto, Bulacan

### Benefits:

With the collaborative project between DOST and LGU, the members of the Garden City Multipurpose Cooperative in Guiguinto, Bulacan will have the technical capacity to propagate more ornamental plants in large scale productions. This is in line with the vision of the Municipal Government of Guiguinto, Bulacan to make Guiguinto as the Garden Capital of the Philippines by the year 2025.

### Contact Details:

Dr. Julius Caesar V. Sicut

Director-DOST Region III

Diosdado Macapagal Government Center, Maimpis,  
San Fernando City, Pampanga



Email: [ord.dost3@gmail.com](mailto:ord.dost3@gmail.com)

Tel. Nos. (045) 455-0800/(045) 455-1733



## 12-HP SINGLE CYLINDER DIESEL ENGINE

This is an initiative to take the 12-hp Single Cylinder Diesel Engine (SCDE) towards the path of commercialization. The project is an off-shoot of the project entitled, 'Development of 12-hp Single Cylinder Diesel Engine,' which was completed in 2017, and resulted in the successful production of five prototype SCDE units. These were tested and evaluated. Results of which proved that the performance of the said prototypes were comparable to leading commercial brands of the same power rating.

Under the project, 20 SCDE units will be produced to test their applicability to and compatibility with existing farm machineries under actual farm conditions in various locations in the country. Ultimately, the project aims to promote, market, and successfully transform the 12-hp SCDE into a marketable product that will generate profitable business for local equipment fabricators.

### Project Cost:

PhP 2.6M

### Funding Agency:

DOST-Philippine Council for Industry, Energy and Emerging Technology Research and Development

### Partners:

- Supercast Foundry and Machinery Corporation
- R.U. Foundry and Machinery Shop Corporation

### Benefits:

The 12-hp SCDE is competitive with imported engines. It is low cost, but offers good quality features that will best benefit machine fabricators as the manufacture of this machine can potentially widen business horizons.

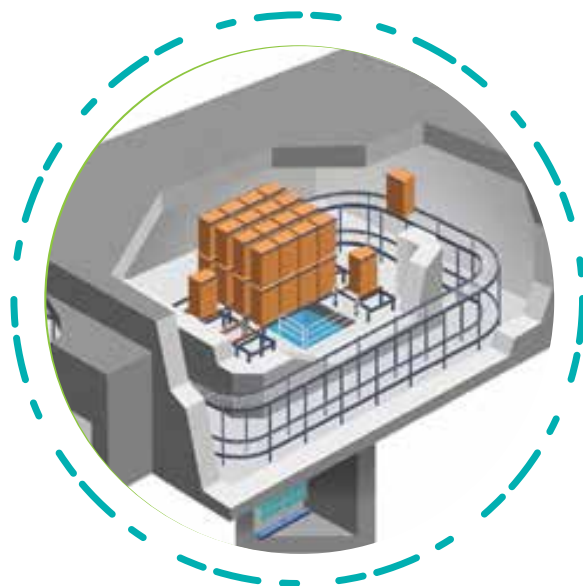
**Target Launch Date:** 5 November 2020



### Contact Details:

Engr. Jonathan Q. Puerto  
Deputy Executive Director for Technical Services  
DOST-MIRDC

DOST-Metals Industry Research and Development Center  
DOST-MIRDC Compound, Gen. Santos Ave., Bicutan, Taguig City  
PO Box 2449 Makati, 1229 Metro Manila, Philippines  
Tel. nos.: 8837-0431 to 38 (connecting all departments)  
Fax nos.: 8837-0613 and 8837-0430



## FIRST FULLY AUTOMATED GAMMA IRRADIATION FACILITY

The Department of Science and Technology-Philippine Nuclear Research Institute (DOST-PNRI) is upgrading its Multi-purpose Gamma Irradiation Facility established in 1989 into a commercial-scale facility to meet the increasing demand from the industry while waiting for the private industries to put up their own irradiation facilities. The upgrade into a fully-automated facility was made possible under the Technical Cooperation Project of the International Atomic Energy Agency (IAEA) with cost-sharing from the Philippine Government.

**Project Cost:**

PhP 60M

**Funding Agencies:**

IAEA, DOST-PNRI, and DOST-PCAARRD

**Partner:**

- IAEA

**Benefits:**

The fully automated Gamma Irradiation Facility will increase the volume of products that can be irradiated and provide higher income for industry partners, less shut-down time during operation in a continuous mode, flexibility in irradiating products requiring low, medium, and high doses, and a safer environment for operators of the facility.

**Target Launch Date:** August 2020



**Contact Details:**

Luvimina G. Lanuza, MNSA  
 Head, Irradiation Services Section, Nuclear Services Division  
 Philippine Nuclear Research Institute  
 Commonwealth Ave., Diliman, Quezon City  
 Tel. Nos.: 8920-8789 / 8929-6011 to 19 local 248  
 lglanuza@pnri.dost.dost.gov.ph



## REGIONAL YARN PRODUCTION AND INNOVATION CENTER (RYPIC)

The Regional Yarn Production and Innovation Center (RYPIC) is a project of the Department of Science and Technology-Philippine Textile Research Institute (DOST-PTRI) under the Inclusive Innovation TELA or DOST i2TELA Program.

The RYPIC is the first micro-scale yarn spinning facility to produce crafted yarns in blends of natural textile fibers of abaca, banana, and pineapple leaf, in combination with cotton. The facility aims to establish a system of natural fabric production and increase the value of textiles traditionally produced in the community.

Through the RYPIC, the DOST-PTRI commits to produce 2,000 kg of cotton/abaca yarns to be converted to 6,000 meters of fabric by July 2020, which can be used to produce uniforms of government employees in accordance with R.A. 9242.

### Project Cost:

PhP 41.57M

### Funding Agencies:

- DOST-GIA and DOST-PTRI

### Partners:

- Iloilo Science and Technology University, Great Women Philippines Corporation, DOST Regional Office-VI, and the Local Government Unit of Miagao

### Benefits:

The RYPIC aims to jumpstart local ecosystems for the textile sector particularly in the regions. It aims to supply yarns and fabrics using local raw materials to micro, small, and medium enterprises in the fashion industry, academe, and government institutions.

**Target Launch Date:** July to August 2020



### Contact Details:

Dir. Celia B. Elumba, DOST-PTRI Director  
celiabelumba.ptri@gmail.com

Engr. Daniel Leon J. Lavin, Supervising SRS  
danee\_lavin@yahoo.com.ph





## TISSUE-CULTURED COCONUT PLANTING DAY

### Tissue Cultured Coconuts and Hybrid Coconuts

To revitalize the Philippine coconut industry, there is a need to replant old and senile trees in about 500,000 hectares of almost unproductive coconut plantations in the country. The low productivity of coconut trees can be addressed with the Coconut Somatic Embryogenesis Technology (CSet) developed by the Philippine Coconut Authority, in cooperation with state universities and colleges. With CSet, around 200-300 plantlets per plumule on the average can be produced through mass propagation of quality planting materials from responsive tall, dwarf, and hybrid coconut varieties.

Another initiative that is being implemented is the production of coconut hybrid seedling through the establishment of coconut hybridization farms. This will also provide S&T-based assessment of the performance of the mother palms of the hybrids in diverse ecological conditions.

#### Project Cost:

PhP 260 M

#### Funding Agency:

Department of Science and Technology-Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development.

#### Partners:

- DOST Regional Offices - IV-A, V, VIII, IX, XI, XII
- PCA- Albay Research Center
- PCA-Zamboanga Research Center
- University of the Philippines Los Baños
- University of the Philippines Mindanao
- Visayas State University
- Bicol University College of Agriculture and Forestry
- Provincial Local Government Units of Quezon Province

#### Benefits:

The technology will help produce quality planting materials of improved coconut varieties for the replanting program in coconut growing areas and new planting in coastal areas in Regions IV-A, V, VIII, IX, XI, XII and BARMM.

**Target Launch Date:** November 2020



#### Contact Details:

Dr. Cristeta A. Cueto  
Department Manager II/ CSetProgram Leader  
kristicuet@gmail.com / pca\_arc4503@yahoo.com

Ms. Erlene C. Manohar  
OIC Deputy Administrator for R&D / Coconut Hybridization Project Leader  
ecmanohar@yahoo.com/pca.research ranch2019@gmail.com



## HYBRID TRIMARAN MAIDEN VOYAGE

The Hybrid Trimaran is a fast sea craft that uses renewable wave energy from ocean waves as a mass transport solution and addresses the growing concern on the CO<sub>2</sub> emission in maritime transport. The vessel utilizes multi-engine technology to counter total engine failures while at sea thereby reducing maritime accidents. The Hybrid Trimaran sports a modern design, is environment-friendly, safe, and unsinkable.

The fast sea craft can carry 150 passengers, four vans and 15 motorcycles. The design uses mild steel structure for better resistance performance and higher structural efficiency.

The project is the brainchild of shipyard owner Engr. Jonathan Salvador and is implemented by the Aklan State University (ASU), with the Maritime Industry Authority (MARINA) and Metallica Shipyard as its partners.

**Project Cost:**

PhP 76M

**Funding Agency:**

DOST-GIA Program

**Partners:**

DOST-PCIEERD, Aklan State University, Metallica Shipyard, MARINA

**Benefits:**

The Hybrid Trimaran is environment friendly, safe, and unsinkable thereby ensuring safe inter-island sea travel for passengers. It also offers cost effective alternative to imported sea vessels or the conventional monohull vessels that will significantly change the Ro-Ro shipping industry and provide a go-green alternative in the maritime sector.

**Target Launch Date:** September 2020



**Contact Details:**

Project Leader: Dr. Yasmin Tirol  
Associate Professor, Aklan State University  
yhptirol@asu.edu.ph  
09184112227 or 09362643980



## LAUNCHING OF DOST-ENABLED SMART CITIES

PH Smart Cities, through the PATURO: Platform for Assessment and Tracking of Urbanization-Related Opportunities, aims to formulate a Smart Index that can reliably and accurately capture the city's "health" such as the diverse interactions between the city's people, land, transportation system, and various economic activities.

It intends to build a data hub to allow interactive access to the data and enable extraction of insights, build mathematical models and/or simulations to generate features for a smart index, and build a city dashboard with different levels of analytics.

In support of the Smart City concept, Cauayan City, Isabela in Region II adopted the electric scooter or eScooter to provide on-demand environment friendly transportation solutions throughout the community. It was launched in 27 January 2020.

Regions IV-A, VI, and Caraga are also in the process of making plans with their respective LGUs to become Smart Cities.

**Funding Agency:**

DOST-Philippine Council for Industry, Energy, and Emerging Technology Research and Development

**Project Leader:**

Dr. Erika Fille T. Legara

**Partners:**

Region II, Region IV-A, Region VI, Caraga

**Benefits:**

The Smart Index and its supporting platform will help city policymakers to rapidly assess the current state of their city with "what-if" scenarios. PATURO will become a valuable tool for decision support and scenario planning for cities all over the Philippines and beyond.



**Target Launch Date:**

DOST Region II July 20, 2020

DOST Region VI October 2020

**Contact Details:**

Dr. Erika Fille T. Legara

Professor/Aboitiz Chair in Data Science/

Deputy Director, ACCeSs@AIM Asian Institute of Management

ELegara@aim.edu

(+632) 8892-4011 ext. 2874



## BIOMEDICAL DEVICES

Ginhawa or ReliefVent – a ventilator for both children and adults that is projected to cost 40 percent lower than other portable ventilators in the market.

Biotek-M Dengue Aqua Kit – a confirmatory diagnostic test kit that can detect dengue infection in an hour or less. It is as efficient but is less costly than currently available technology used in dengue diagnosis.

RxBox is a biomedical device capable of capturing medical signals through built-in medical sensors, which was developed to support maternal and child health care, facilitate identification of patients needing control of chronic non-communicable diseases in Geographically Isolated and Disadvantaged Areas (GIDAs), and enable tele-consultations between primary care physicians and clinical specialists through messaging and transmission of health information.



**Project Cost:**

Biotek-M (PhP 24.4 M),

RxBox (PhP 352,945,742.30 M)

**Funding Agency:**

DOST-PCHRD

**Partners:** University of the Philippine (UP)

Diliman, EEEI-UP Diliman, DOST-ASTI,

National Telehealth Center-UP Manila,

UP College of Medicine-UP Manila,

DOST Region IV-A, DOST Regional Offices



**Contact Details:**

Ginhawa

Abundio Balgos, MD, MHA, FPCP, FPCCP

Professor, UP College of Medicine

University of the Philippines Manila

Email: bundsmd@gmail.com

Biotek-M

Dr. Raul Destura

Manila HealthTek Inc.

109 Bgy. Sta. Elena, Mayor Gil Fernando Ave., Marikina City

Tel No: +639178057331, +639178042079, 8950-5026, 8358-9723

Email: tak2us@manila-healthtek.com

RxBox

Dr. Alexander R. Madrigal

Regional Director, DOST IV-A

alexrmadrigal@yahoo.com

Mr. Noel Banez

Senior Science Research Specialist, DOST IV-A (under the RxBox  
1000 Project)

nabanez.rxbox1000@gmail.com

Dr. Portia Grace Fernandez-Marcelo

University of the Philippines Manila - College of Medicine

phfernandezmarcelo@up.edu.ph

Engr. Luis Sison

University of the Philippines Diliman - Electrical and Electronics

Engineering Institute

lgsison@up.edu.ph



## FIRST ANTI-DENGUE DRUG

The Department of Science and Technology-Philippine Council for Health Research and Development (DOST-PCHRD) funded the Clinical Study (Phase 1) of the Anti-Dengue Drug under the Tuklas Lunas Program.

The program aims to develop a herbal drug that will be the first definitive treatment for dengue. It also aims to assess the effects of the drug preparation (using medicinal plants) by measuring the following parameters: electrocardiogram, hematology, blood chemistry, and vital signs plus assessment of the toxicity per organ system.

**Project Cost:**

PhP 4.7M

**Funding Agency:**

DOST-PCHRD

**Partners:**

- De La Salle University-Health Sciences Institute, Cavite
- Pharmalytics Corporation Manila

**Benefits:**

The herbal drug will address the need to find cure for dengue using natural materials that are effective and cost efficient for patients afflicted by the disease.

**Target Date of Completion for Phase 1:**

30 April 2020



**Contact Details:**

Dr. Josefino Alvero (jralvero@yahoo.com)

Dr. Rita Grace Alvero (biorya1@yahoo.com)



## NEW FACILITIES FOR COMPETITIVENESS

### **Metrology in Chemistry**

The laboratory is used to treat food products with various safe chemicals to lower biological activity, give desirable appearance, taste, and/or smell, as well as to preserve them.

### **Metrology in Biology**

The facility aims to establish a laboratory and traceability for food microbiological testing through the development and production of proficiency test materials.

### **Modular Multi-Industry Innovation Center**

The facility is for scale-up R&D on food, dietary supplement, and oral care products using raw materials that are by-products of commercial operations.

### **Simulation Packaging Testing Laboratory**

It will be the first of its kind in the Philippines that can simulate actual environmental hazards that packaged products undergo during distribution in the supply chain. The facility is expected to be operational in October 2020.

### **Green Packaging Laboratory**

The facility aims to capacitate the Packaging Technology Division in (1) developing alternative packaging materials/containers (e.g. food trays, cushion, pallet, etc.) using indigenous and renewable materials and (2) process improvement to reduce materials and energy consumption and limit waste. The laboratory will be operational by October 2020.

### **Target Launch Dates:**

Metrology in Chemistry and Biology Laboratories: 09 October 2020;  
Simulation Packaging and Green Packaging Laboratory: 22 October 2020;  
Modular Multi-Industry Innovation Center: June 2020  
Green Packaging Laboratory: 22 October 2020



### **Contact Details:**

Dr. Annabelle V. Briones,  
Director, DOST-ITDI  
Tel. No. (6328) 837-3167, 837-2071 to 82  
loc. 2218, 2215  
Telefax No. (6328) 837-3167/837-6150  
e-mail address: avbriones@itdi.dost.gov.ph ,  
avbriones2003@yahoo.com

### **Project Cost:**

Metrology in Chemistry and Biology - PhP198 M  
Modular Multi-Industry Innovation Ctr. - PhP 50 M



## LAUNCHING OF SCIENCE FOR THE PEOPLE BOOKS

The Department of Science and Technology-National Research Council of the Philippines (DOST-NRCP) will publish three books on science stories for popular audiences to bring science, technology, and innovation closer to the people.

The popular science books under the Science for the People (SFTP) Book Series are the following: “Science for Scale” heralds first hand experiences and practical advice from scientists, doctors, engineers, and entrepreneurs on how to grow businesses sustainably through innovation; “Science for Success” chronicles the success stories of micro, small and medium entrepreneurs (MSMEs) assisted by the Small Enterprises Technology Upgrading Program using science and technology as winning strategy; and Science for Impact captures the stories of ordinary Filipinos in various sectors who harmoniously work together to improve their communities.

**Project Cost:**

PhP 13,849,500

**Funding Agency:**

DOST-GIA

**Partners:**

Various private and public institutions

**Benefits:**

The SFTP Book Series will serve as inspirational literature for MSMEs and ordinary Filipinos to embrace a culture of science that can help them improve their lives using science, technology, and innovation.

**Target Launch Dates:**

Science fo Scale: May 2020

Science for Success: July 2020

Science for Impact: September 2020



**Contact Details:**

Danielle Canlas

President, CAN PROPERTY HOLDING LTD. CORP

123 Pioneer Street, Mandaluyong City

Tel. No.: 8429-9905





## REGIONAL SCIENCE DISCOVERY CENTERS

The DOST aims to establish several science centers in selected areas in the country to better explain the benefits of science and technology among young students. The Cagayan Valley Science Center is currently operational, while the Pasig Discovery Center will be launched in November. These science centers feature interactive exhibits and activities related to different scientific applications and concepts.

Science Center in Butuan City, Palo (Leyte), and Davao City will also rise soon.

### Project Cost:

Cagayan Valley Science Center - PhP 13.4M  
 DOST-GIA - PhP25 M  
 DOST-NCR - PhP2 M  
 DOST XI - PhP1.23 M  
 DOST VIII - 1.2 M  
 Other partners - PhP 497M

### Partners:

- DOST-PCAARD
- Philippine Foundation for Science and Technology
- Cagayan Valley Science Center - Local Government City of Cauayan
- Pasig City Discovery Center - Local Government City of Pasig

### Benefits:

It will promote awareness and appreciation of science, technology, engineering, and mathematics principles among students and provide employment and enterprise development/livelihood opportunities in the community.

### Target Launch Dates:

DOST Region II - January 2020  
 DOST Region VIII - July 2020  
 DOST-NCR - November 2020



### Contact Details:

Cagayan Valley Science Center  
 Hon. Bernard Faustino M. Dy  
 Mayor, Cauayan City, Isabela  
 0917-893-2469

Pasig City Discovery Center  
 Hon. Victor Maria Regis "Vico" N. Sotto  
 Mayor, Pasig City  
 Tel. No.: 8643 1111

Arch. Carlo O. Martinez (Project-in-Charge)  
 (0917) 5805205



## HANDA PILIPINAS

“INNOVATIONS IN DISASTER RISK REDUCTION AND RESPONSE EXPO 2020”

The strategy of utilizing science, technology, and innovation (STI) in understanding hazards and risk to societies, and in providing science-informed solutions to pervasive but predictable and manageable threats is a tested and proven approach. Thus, the DOST launches the HANDA PILIPINAS: Innovations in Disaster Risk Reduction and Response Expo 2020.

This 3-day event on March 12-14, 2020 at the World Trade Center showcases the latest technologies and innovations of DOST and its partners through interactive exhibitions and hands-on breakout sessions. It aims to improve awareness of stakeholders about available technologies and tools on disaster management for the capability enhancement of the disaster risk reduction and management offices of the local government units to mitigate, prepare and respond to hazards of disasters. It also serves as the localization of the ASEAN Science, Technology and Innovation Platform for Disaster and Climate Resilience, which targets ASEAN member states as major stakeholders.

**Project Cost:**

Php 5.0M

**Funding Agency:**

DOST-National Capital Region and  
DOST-Technology Application and  
Promotion Institute

**Partners:**

- DOST PHIVOLCS
- DOST PAGASA
- DOST STII

**Benefits:**

The exposition provides the participants a range of STI options that may be suitable for their particular DRRM needs and that they may avail, acquire, and/or adopt. There are opportunities for hands-on experience of some of the STI options and interaction with researchers, innovators, and inventors.

**Event Date:** 12-14 March 2020



**Contact Details:**

DOST-NCR

Tel. No.: 8519-8702 or 8837-2071 loc 2402

drmm@ncr.dost.gov.ph



## AUTOMATED GUIDEWAY TRANSIT FOR BATAAN

The Automated Guideway Transit (AGT) is an elevated train system that can run at a speed of 60 kilometer per hour and can carry 30 passengers. Developed by engineers from the Department of Science and Technology-Metals Industry Research and Development Center (DOST-MIRDC), the AGT costs cheaper, is lightweight, and has zero greenhouse emissions since it is electricity-powered. On 14 March 2019, DOST turned-over the prototype version of the AGT to the Bataan Peninsula State University (BPSU) to help their academic program in Railway Engineering at the baccalaureate level.

**Funding Agency:**  
DOST-GIA

**Partners:**

- DOST Region III
- BPSU
- Provincial Government of Bataan

**Benefits:**

It can be utilized as instructional medium for the engineering programs of the College of Engineering and Architecture and eventually in the development of an academic program in Railway Engineering at the BPSU and to provide the country's human resource requirement in the transportation sector.

**Contact Details:**

Dr. Gregorio Rodis  
President  
Bataan Peninsula State University  
Balanga City, Bataan  
(047)237-2350





## PHILIPPINE GENOME CENTER IN VISAYAS

The establishment of the Philippine Genome Center (PGC) in the Visayas ushers in the growing need to expand the services of the PGC in the University of the Philippines Diliman to generate and translate useful information in the field of genomics into actionable results.

With the rich biodiversity in the Visayas and Mindanao regions, the PGC Visayas will serve as hub for extensive research in agriculture—from crops to livestock—as well as marine resources that can be tapped as sources of natural products and other industrially and medically relevant resources. Further, because of its strategic location, PGC Visayas will sustain activities aimed at deepening the talent pool in genomics and bioinformatics in the regions.

The program is being implemented by the Department of Science and Technology-Philippine Council for Health Research and Development (DOST-PCHRD).

**Project Cost:**

PhP 146 M (for three years)

**Funding Agency:**

DOST-PCHRD

**Partners:**

DOST-VI, Philippine Genome Center at the University of the Philippines (UP) Diliman, UP Visayas, UP Mindanao



**Benefits:**

The PGC Visayas can enhance engagement with researchers, academics, and even industry organizations in medicine and public health, agriculture, fisheries, livestock, biodiversity, and ethnicity. It can also strengthen the pool of experts to develop diagnostic kits/molecular markers and improved variants of agricultural products to improve food security.

**Target Launch Date:** 28 April 2020

**Contact Details:**

Dr. Cynthia P. Saloma  
Philippine Genome Center

Dr. Victor Marco Emmanuel N. Ferriols  
UP Visayas

Dr. Lyre Anni E. Murao, UP Mindanao



## BUHAWI LANDS IN THE NAVY: DOST-DND PARTNERSHIP

BUHAWI is an automated gun mount for heavy barrel Browning 0.50 caliber machine gun. The project is a product of the design and fabrication of the gun mount, as well as the design and development of the control system. Ultimately, it is a proud integration of the mechanical and control systems of the gun mount. It is a tangible proof of the Filipino's ingenuity to produce a remote-controlled weapon station. This project, implemented by the DOST-Metals Industry Research and Development Center (DOST-MIRDC), will be able to support the achievement of a sustainable and self-reliant defense posture.

### Project Cost:

PhP P29,000,000.00

### Funding Agencies:

- DOST-GIA, DOST-MIRDC

### Partners:

- Philippine Navy-Naval Sea Systems Command
- Mechatronics and Robotics Society of the Philippines

### Benefits:

The development of the project signals the sustainable and self-reliant defense posture of the Philippine military institution where research and development have been instrumental in promoting national security.

**Target Launch Date:** June 2020

### Contact:

Engr. Jonathan Q. Puerto  
Deputy Executive Director for Technical Services  
Project Leader, Project BUHAWI



DOST-Metals Industry Research and Development Center  
DOST-MIRDC Complex, Gen. Santos Ave., Bicutan, Taguig City  
PO Box 2449 Makati, 1229 Metro Manila, Philippines  
Tel. nos.: 8837-0431 to 38 (connecting all departments)  
Fax nos.: 8837-0613 and 8837-0430  
Website: <https://www.mirdc.dost.gov.ph>  
Email: [mirdc.mirdc.dost.gov.ph](mailto:mirdc.mirdc.dost.gov.ph)  
Website: <https://www.mirdc.dost.gov.ph>

20

in

2020



**DEPARTMENT OF  
SCIENCE AND  
TECHNOLOGY**



# Editorial Team

## **DOST EXECUTIVE BOARD**

### **FORTUNATO T. DE LA PEÑA**

Secretary, DOST

### **ROWENA CRISTINA L. GUEVARA**

Undersecretary, Research and Development

### **BRENDA L. NAZARETH-MANZANO**

Undersecretary, Regional Operations

### **RENATO U. SOLIDUM**

Undersecretary, Scientific and Technical Services

## **PRODUCTION TEAM**

### **EXECUTIVE EDITOR**

RICHARD P. BURGOS

Director, DOST-STII

### **WRITERS**

DOST MEDIACORE MEMBERS AND RESEARCHERS

### **COPY EDITORS**

RODOLFO P. DE GUZMAN

SHEILA MARIE ANNE J. DE LUNA

## **PRODUCTION COORDINATORS**

ALLAN MAURO V. MARFAL

JONA M. BERNAL

## **LAYOUT AND DESIGN**

KIMVERLYN C. SAYSON

ANGELO C. EVANGELISTA

JAMES B. INTIA





DEPARTMENT OF SCIENCE AND TECHNOLOGY