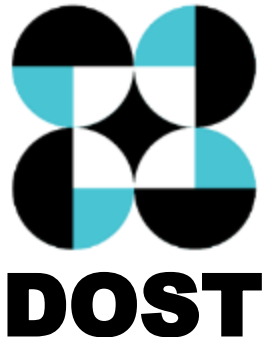


Technology Transfer of
DOST R&D Outputs

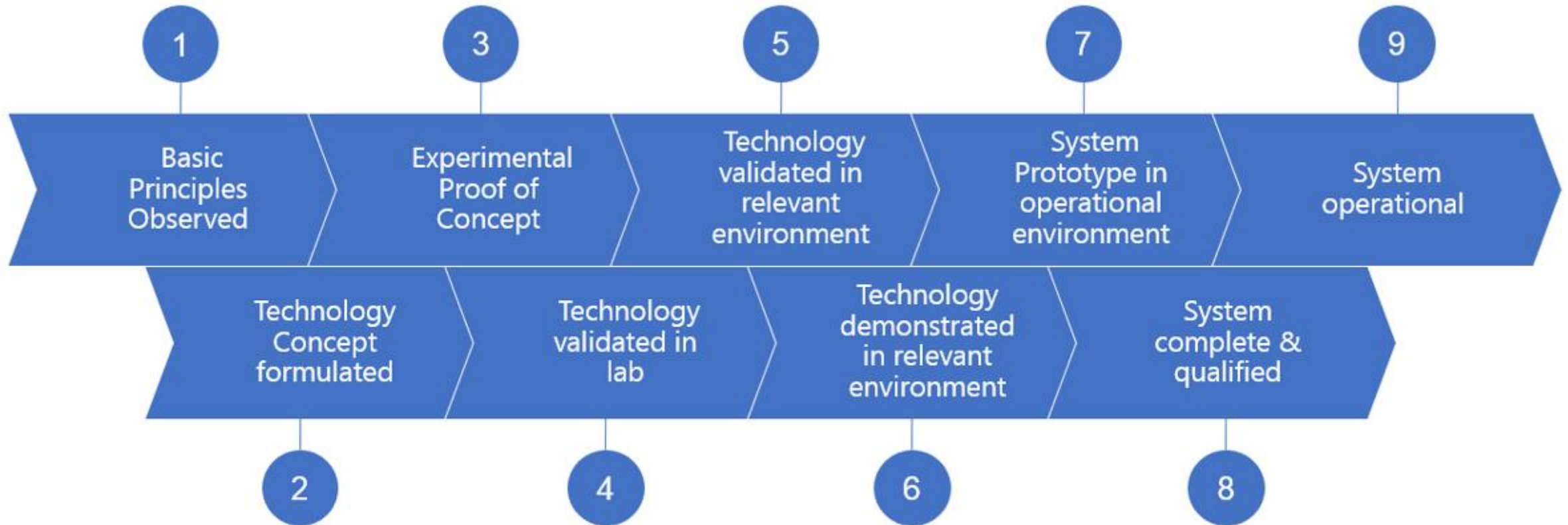
ROWENA CRISTINA L. GUEVARA, Ph.D.

Undersecretary for Research and Development
Department of Science and Technology



MAP General Membership Meeting
24 June 2019; Dusit Thani Hotel, Makati City

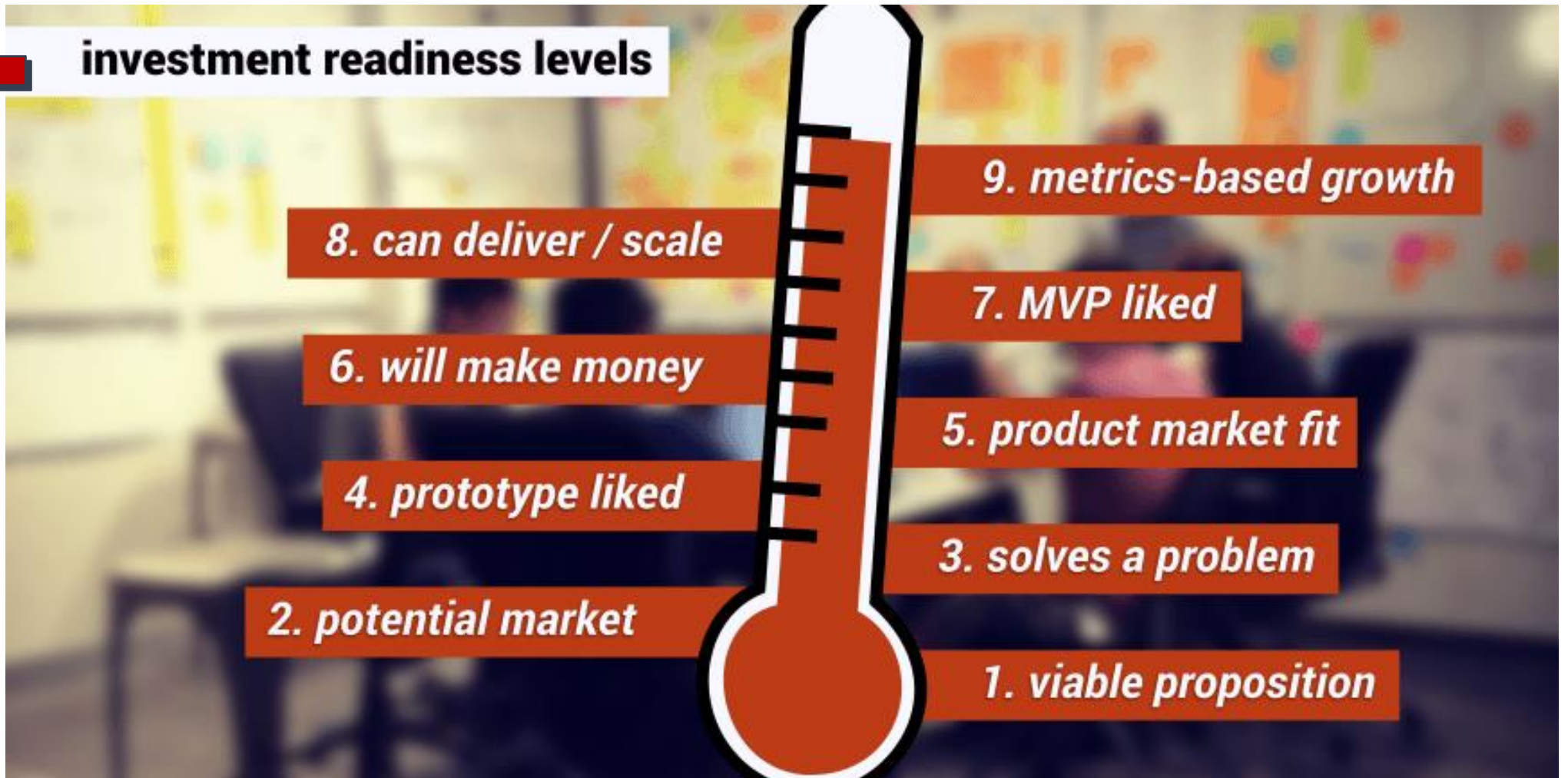
Technology Readiness Level (TRL)



SOURCE <https://www.2b1stconsulting.com/technology-readiness-level-definition/>

IRL

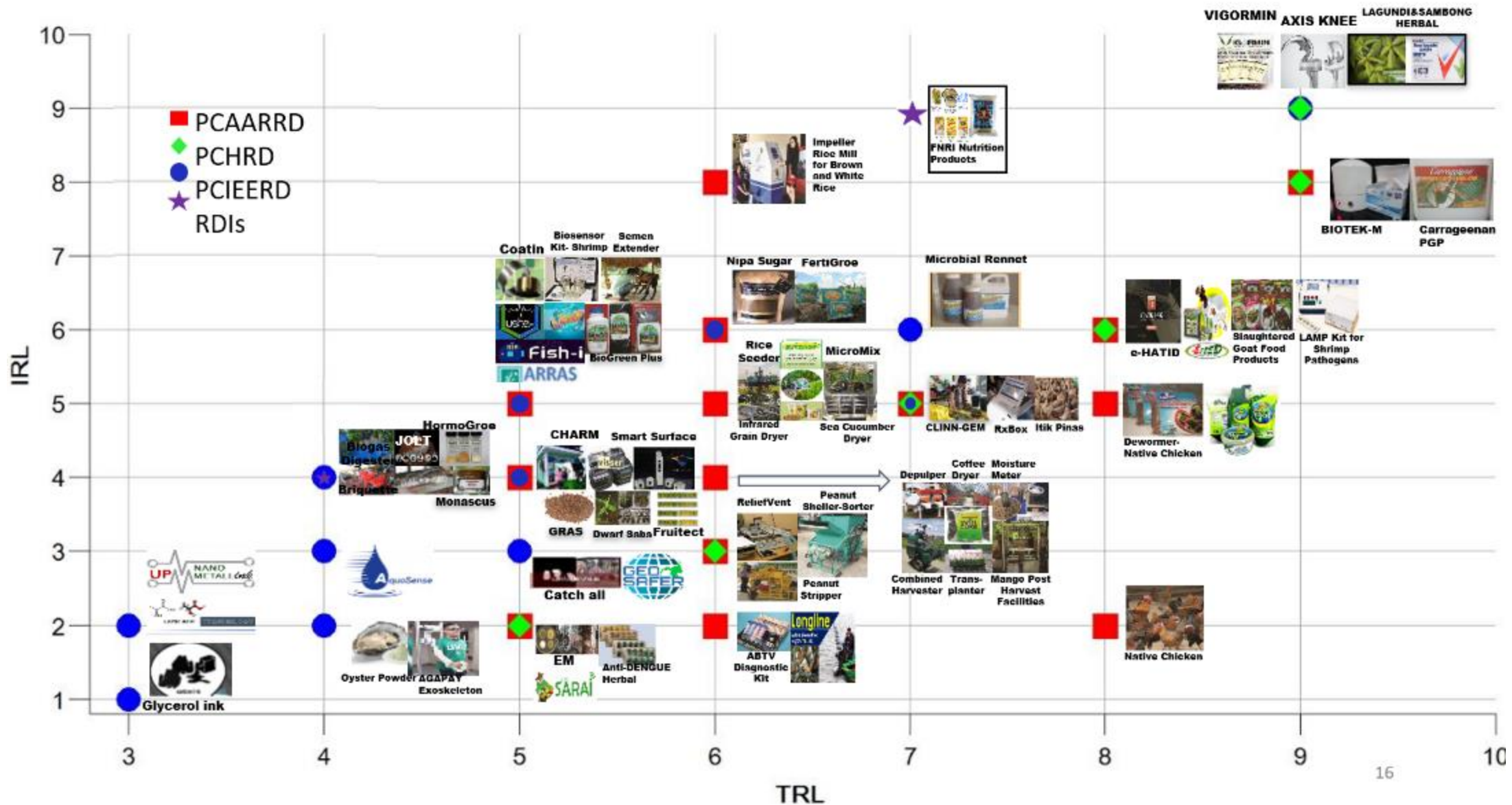
investment readiness levels



SOURCE http://cheltenhamconsultants.com/investor_readiness_levels.html

Innovation makes our lives easier.

DOST provides technological solution to societal needs



Role of R&D in nation-building

Research and development (R&D)

Comprising of **creative** work undertaken on a **systematic** basis in order to **increase the stock of knowledge**, including knowledge of man, culture and society, and the use of this stock of knowledge to **devise new applications**

Innovation

A process, product or service that is **new, original, or improved**, which **creates social and economic value**

Technology for Disaster-management

From **NOAH** to **Climate Change Adaptation - Disaster Risk Reduction (CCA-DDR) Program**



- 1,212** Hydrometeorological Devices
Installed nationwide to monitor weather and flooding conditions
- 635** Municipal Flood Hazard Maps
Publicly available
- 67** Cities and Municipalities
Weather forecast with 4 hr lead time
- 16** Storm Surge Inundation Maps
for coastal communities
- 536** Landside Susceptibility Maps
And landside sensors and data communication nationwide

DIWATA 1: ROAD TO SPACE

DIWATA-1 launch to space

*Cape Canaveral, Florida
March 23, 2016*



Availability of locally-sourced medicines



TUKLAS LUNAS



1,796

Terrestrial organisms screened for various disease indications

1,450

Marine microbial organisms (MMO) isolated for cancer and infection





PCIEERD's HYBRID TRAIN



INPUTS

~160 Million in funding
~20 engineers
3 years of R&D
3 years of Marketing

ACTIVITIES

Training of Researchers
Design and Construction
Testing and Certification
Testing equipment

OUTPUTS

Blueprint for Hybrid
train set
1 train unit

OUTCOMES

Adoption of PNR
Extra commuter
train from Alabang-
Bicutan

IMPACT

Comparison of HET with DMU and DHL

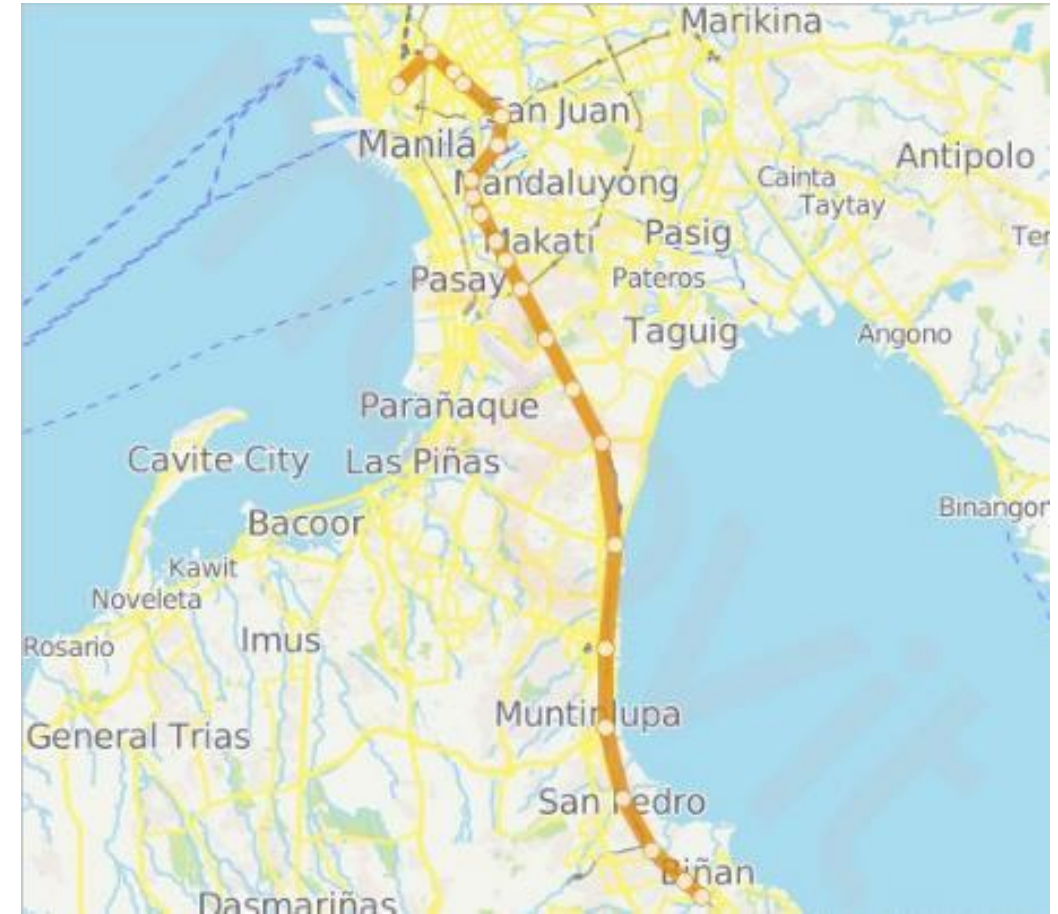
	Philippine HET	Indonesian DMU	Indonesian DHL
Cost/set	P 120M	P 268M	P 435M
Passengers/set	880	1,090	1,330
Cost/passenger	P 136K	P 245K	P 327K

Hybrid Electric Train (HET), Diesel Multiple Unit (DMU), Diesel Hydraulic Locomotive (DHL)

Solutions through Science



Passed the Stage 1 and Stage 2 Reliability, Availability, Maintainability & Safety (RAMS) Certification by the Philippine National Railways (PNR)



The First Filipino-made **Hybrid Electric Train**

Process of Technology Transfer

(DOST-RDI & Universities)

**Letter
of
Intent**

**Consultative
Meetings &
Terms Sheet**

**FOB
and
FOR**

**Ocular
Inspection,
TNA and
Evaluation**

**Technology
Licensing
Agreement &
Written
Recommendation**

**Tech
Transfer
implementation**

Company signifies interest in adopting RDI technology

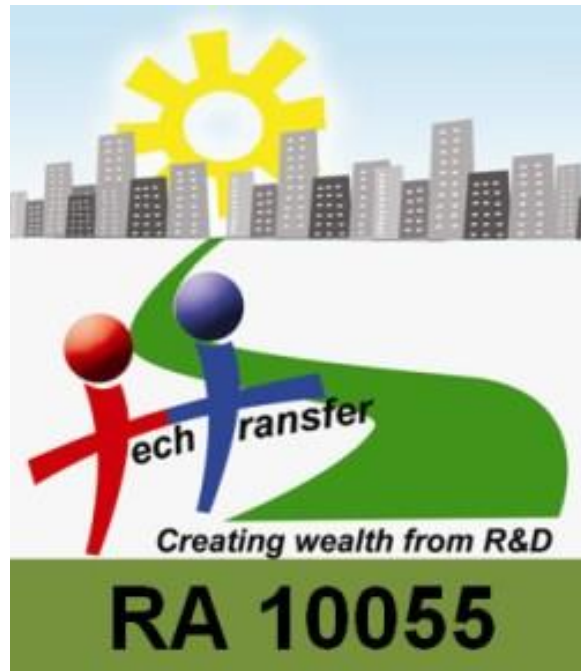
Consultative meetings
Negotiation on the terms of agreement
Signing of Terms Sheet

- Fairness Opinion Board (FOB) evaluation of fairness of transaction for both parties
- Preparation of Fairness Opinion Report (FOR)

- Tech Needs Assessment
- Evaluation of assessment results.

- Final Negotiation
- Signing of TLA

- Training
- Demonstration
- Documentation
- Production
- Marketing
- Monitoring & evaluation



Philippine Technology Transfer Act of 2009



- ✓ Ownership
- ✓ Management
- ✓ Use and Commercialization

DOST IP Policies (6)

1. Intellectual Property Policy
2. Data Sharing Policy
3. Guidelines for the Fairness Opinion Board (FOB) and the Issuance of Fairness Opinion Report (FOR)
4. Technology Transfer Protocol for R&D Institutes
5. IP Management Protocol
6. Establishment and Maintenance of Revolving Funds of DOST RDIs

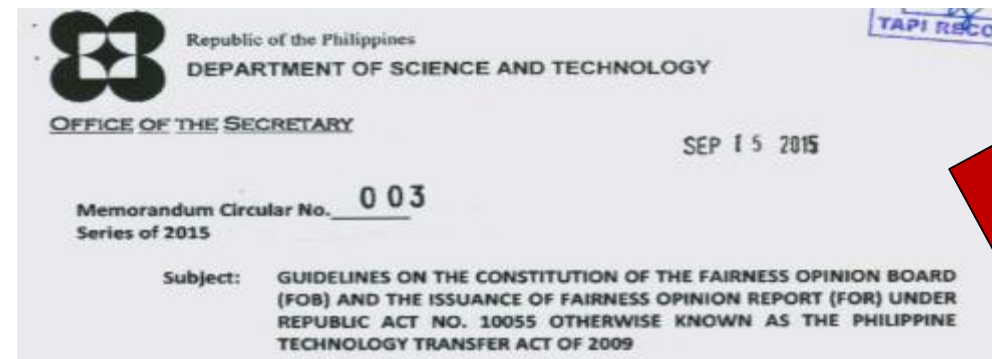
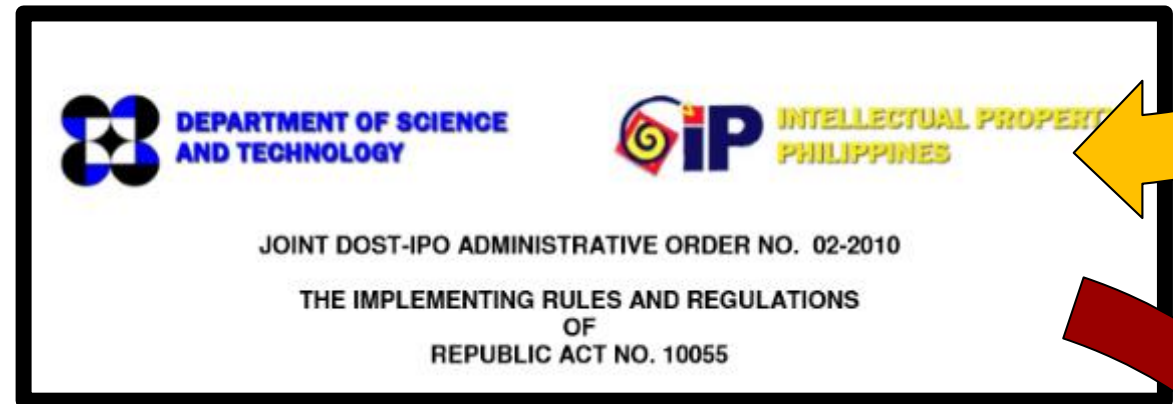
Basis for Fairness Opinion issuance

[REPUBLIC ACT No. 10055]

AN ACT PROVIDING THE FRAMEWORK AND SUPPORT SYSTEM FOR THE OWNERSHIP, MANAGEMENT, USE, AND COMMERCIALIZATION OF INTELLECTUAL PROPERTY GENERATED FROM RESEARCH AND DEVELOPMENT FUNDED BY GOVERNMENT AND FOR OTHER PURPOSES

Rights and Responsibilities of
Government Funding Agency (GFA) and Research and Development Institutes (RDIs)

- **Article III, Sec. 7, RA 10055**



✓ Secure **Fairness Opinion Report (FOR)**

What is a Fairness Opinion Report (FOR)

- a statement expressing the opinion of the Fairness Opinion Board (FOB) as to the fairness to the GFA of the proposed transaction, particularly its financial terms.

When FOR is mandatory...

**GFA assumed
ownership of
IP**

**RDI decides to
directly
negotiate
agreement**

**If RDI is
required by
GFA to
secure FOR**

**For
incorporation
of Spin off**

Modes of Technology Transfer



Licensing and Technical Assistance Agreement



Contract Research and Development Agreement



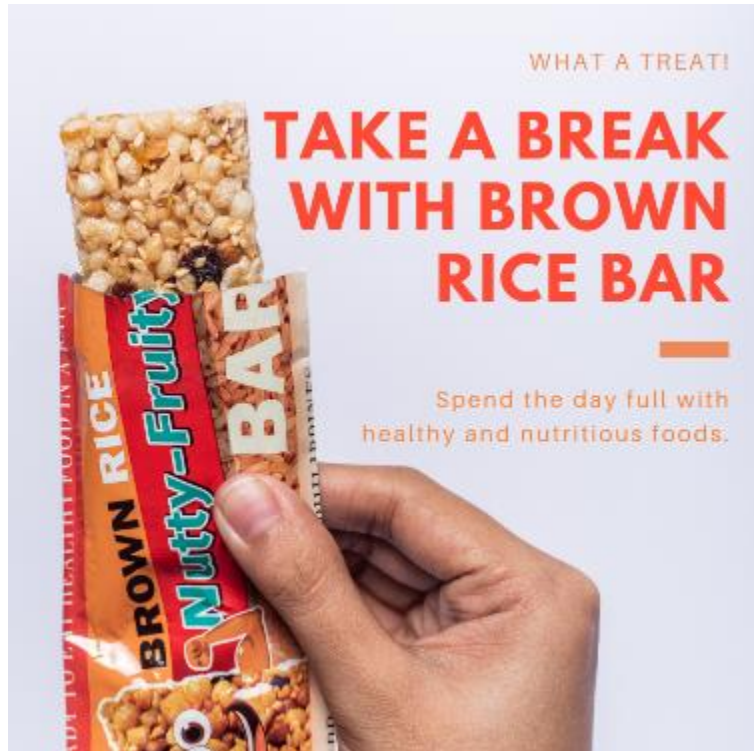
Technology Demonstration and Training -
Consultancy/ Technical Assistance



DOST

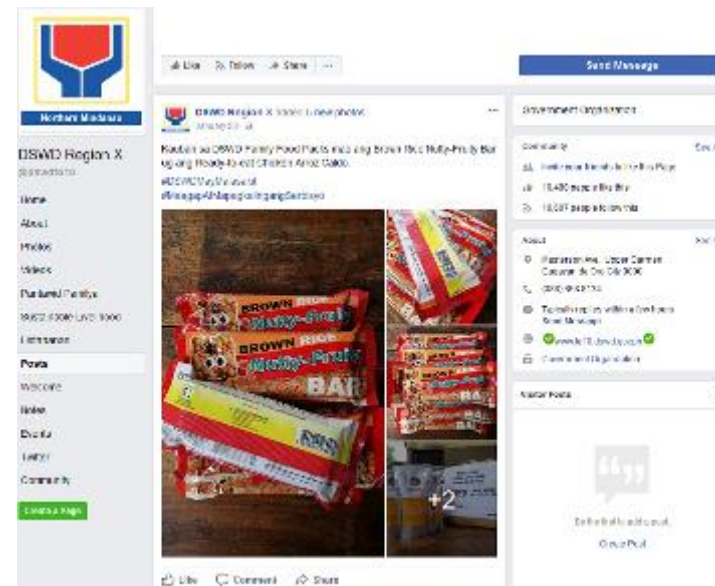
Transferred Technologies

Brown Rice Nutty Fruity Bar



in Sta. Barbara, Pangasinan

- ✓ Trademark registered
- ✓ Licensed for 5 years
- ✓ Licensing fee: Php 50,000.00
- ✓ Royalty: 2% based on gross sales



2015

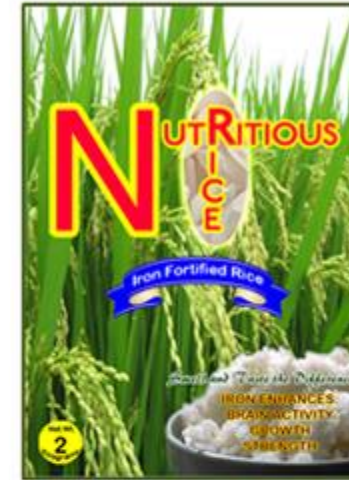
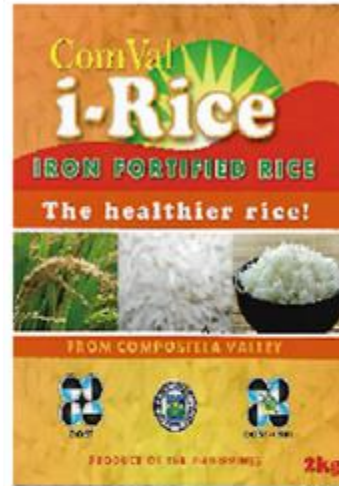
Total declared sales
= P3,974,900.00

DEC 2014 1st P.O. for 168, 525 pcs of bars



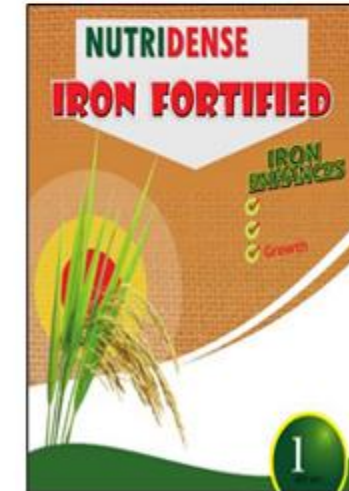
IRON-FORTIFIED RICE

Loronix
Rice Mill
Saavedra Rice Mill
Bagayas Rice Mill
Davao Region



CLG Health
Food Products
Inc.
Gensan City

J.D. Aguilar
Rice Mill
San Leonardo,
Nueva Ecija



Nutridense
Food Mfg. Corp
Sta. Barbara,
Pangasinan

- ✓ Trademark registered
- ✓ Licensed for 5 years
- ✓ Licensing fee: Php 15,000.00
- ✓ Royalty: 1% based on gross sales

Current Industry Partners

Nutrition Educators Kit (NEK)



FNRI

ACCESSPRINT
CORPORATION

19, 1st Avenue cor. Sta Maria Drive, Sta. Maria Industrial Estate, BagumbayanTagu.
Tel. Nos.:0917-8127420 • +632 836 8464 • +632 519 1064 Telefax: +632 836 0
Email: accessprintcorp@yahoo.com; czarcueto@gmail.com

- ✓ Copyright registered
- ✓ Licensed for 2 years
- ✓ Licensing fee: Php 100,000.00
- ✓ Royalty: 5% based on gross sales

CACAO PROCESSING EQUIPMENT DESIGNS



Cacao Roaster Design
IP 2-2017-000008



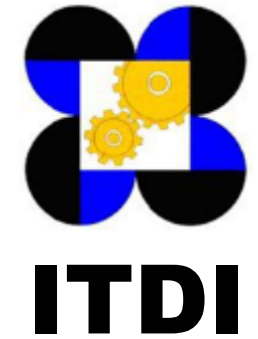
Cacao Grinder Design
IP 2-2017-000006



<https://www.liberaldictionary.com/cacao/>



**Cacao Desheller/
Winner Design**
IP 2-2017-000009



RS UNITECH
Manufacturing & Trading Corporation

LICENSEE: RS Unitech manufacturing and Trading Corporation

Welborne Industrial Park, Brgy. Bancal, Carmona, Cavite

<http://rsunitechmfg.com/>

	<i>Roaster Design</i>	<i>Desheller/ Winner</i>	<i>Grinder</i>
Technology Fee*	Php 171, 000.00	Php 113,000.00	Php 88,000.00
Royalty Rate	3% per unit sold (based on selling price)	3% per unit sold (based on selling price)	3% per unit sold (based on selling price)
Years Licensed**	3 years	3 years	3 years

*based on R&D cost

** subject for renewal

Ready-to-eat Chicken Arroz Caldo



KAI-ANYA FOODS INT'L. CORP

Premier Port St. corner Bulungan Ave., Navotas Fishport Complex, Navotas, Metro Manila

<https://kaianya.com/>

Technology Fee: Php 180,000.00

Royalty Rate: 3% based on gross sales

Year Licensed: 2015 - current



<http://partaste.com/worldrecipes/arroz-caldo/>

Water hyacinth dryer



FPRDI

Utility Model 2/2014/0918



Licensed to Remdavies
Enterprises

Los Baños, Laguna

Licensing fee: P5,000.00

- ✓ Reduction in drying time from 10 days to 3 hours
- ✓ 50% increase in production volume
- ✓ 50% increase in monthly gross sales

Licensed to Local Government Unit – Cardona, Rizal (7 years)

Licensing fee: P5,000.00



- ✓ **Reduced drying time** from 10 days to 4 hours
- ✓ More than **200% increase in productivity** of workers
- ✓ **300% increase in income** of the LGU
- ✓ **Product upgraded** from de-fibered stalks to wall and floor mats

Carrageenan Plant Growth Promoter



Gamma processing of seaweeds and its unique composition*

* w/ local & international patent applications filed in 2017



Licensing fee: P1,500,000.00
Royalty: 5% or gross sales



**Licensed to HL Trading Co., Inc.,
Davao City (8 years)**

PNRI is looking for National and International Partners in Production and Distribution



DOST

TECHNOLOGIES

Rice Combined HARVESTER

An improved machine that has the ability to operate during wet harvest season with an **increased capacity from 1.5 to 2 ha/day.**



<https://steemit.com/aceh/@osella/golden-plants-cd0240aa36335>

TRL	6
IRL	4
ROI/IRR	67%
PAYBACK	1.7 years
INVESTMENT	Php 9.6M

TECHNOLOGY GENERATOR
Dr. Caesar Joventino M. Tado
Philippine Rice Research Institute

For inquiries, contact DOST-PCAARRD
☎ (049) 554-9670 or 536-1574
✉ pcaarrd@pcaarrd.dost.gov.ph

Rice TRANSPLANTER

Can transplant 2 to 6 seedlings per hill;
helps minimize labor cost (2 persons
needed) compared to manual transplanting
(20-25 persons).

**TRL****6****IRL****4****ROI/IRR****58 %****PAYBACK****1.9 years****INVESTMENT****Php 7.6M****TECHNOLOGY GENERATOR**

Engr. Arnold S. Juliano
Philippine Rice Research Institute

For inquiries, contact DOST-PCAARRD

☎ (049) 554-9670 or 536-1574

✉ pcaarrd@pcaarrd.dost.gov.ph

Rice **SEEDER**

A local 8-row riding-type precision seeder that can have a **seeding rate of 15kg/ha to 30 kg/ha and at least two (2) ha/day** field capacity and suitable both for hybrid and inbred rice production.



TRL

6


IRL


5

TECHNOLOGY GENERATOR

Engr. Eden Gagelonia
Philippine Rice Research Institute

For inquiries, contact DOST-PCAARRD

 (049) 554-9670 or 536-1574

 pcaarrd@pcaarrd.dost.gov.ph

RICE TRANSPLANTER ATTACHMENT (RTA) for Hand Tractors

- No. of Rows: 4
- Capacity: 1.6 ha/day
- Planting Distance: 30 cm x 20 cm
- Field Efficiency: 80%
- Planting depth: 3-5 cm
- Power Requirement: 7 or 9 HP Diesel Engine
- Manpower Requirement: 1 Operator, 1 Helper



TRL

5

IRL

4

SRP

Php 175,000.00

**FOR INQUIRIES,
WRITE OR CALL**

Engr. Robert O. Dizon

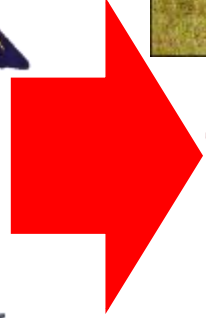
 mirdc@mirdc.dost.gov.ph

 www.mirdc.dost.gov.ph

 (02) 837-0431 to 38 local 401/230

RICE HARVESTER ATTACHMENT (RHA) for Hand Tractors

- Capacity: **0.5 ha/ day**
- Working Width: **0.8 meter**
- Loss Ratio: **< 3.5%**
- Impurity Ratio: **6%**
- Power Reqmt: **9Hp Diesel Engine**
- Manpower Reqmt: **1 Operator, 1 Helper**



TRL	5
IRL	4

SRP **Php 155,000.00**

- Processes:
1. Cutting
 2. Hauling
 3. Threshing
 4. Cleaning
 5. Bagging

**FOR INQUIRIES,
WRITE OR CALL**

Engr. Robert O. Dizon

 mirdc@mirdc.dost.gov.ph

 www.mirdc.dost.gov.ph

 (02) 837-0431 to 38 local 401/230

Dwarf Saba Strain

Has **short stature** (about 4 meter or less) and **early maturing** (harvestable at 12-16 months).



TRL	5
IRL	4
ROI/IRR	21 %
PAYBACK	5.1 years
INVESTMENT	Php 3.25M

TECHNOLOGY GENERATOR
 Dr. Lavernee S. Gueco
 University of the Philippines Los Baños

For inquiries, contact DOST-PCAARRD
 ☎ (049) 554-9670 or 536-1574
 ✉ pcaarrd@pcaarrd.dost.gov.ph

Carrageenan Plant Growth Promoter

With local and international patent applications filed in 2017

A seaweed based plant growth supplement that helps increase yield of crops (rice, etc), increase resistance to diseases, and makes plant stronger and more resilient to typhoons.



TRL

9

IRL

8

INVESTMENT

Php 1.5M

PNRI is looking for new National and International Partners in Production and Distribution *

**FOR INQUIRIES,
WRITE OR CALL**

Dr. Carlo A. Arcilla

 caarcilla@pnri.dost.gov.ph

 www.pnri.dost.gov.ph

 (02) 920-8738/ 9296011 ext 232

MicroMix Biostimulant for Bell Pepper & Bittergourd

A biostimulant composed of a consortium of bacteria that enhances the growth of crop - **better root system, improved plant growth, higher yield**, and reduced chemical fertilizer use



<https://www.gardensalive.com/product/sweet-bell-pepper-hybrid-mix1>



<https://www.healthline.com/nutrition/bitter-melon>

TRL	6
IRL	5
ROI/IRR	60.72 %
PAYBACK	1.65 years
INVESTMENT	Php 9.05M

TECHNOLOGY GENERATOR
Dr. Mannix S. Pedro
National Institute of Molecular Biology and Biotechnology (BIOTECH-UPLB)

For inquiries, please contact DOST-PCAARRD
☎ (049) 554-9670 or 536-1574
✉ pcaarrd@pcaarrd.dost.gov.ph

ACTIcon™ Biopesticide for Cavendish Banana

A biopesticide product for controlling Fusarium wilt or Panama disease, which commonly attacks Cavendish bananas



TRL

6

IRL

5

Field trials have shown **24 to 33% mortality rates** on plants treated with ACTIcon compared to the 100% mortality rate in untreated plants

TECHNOLOGY GENERATOR

Ms. Irene A. Papa
National Institute of Molecular Biology and
Biotechnology (BIOTECH-UPLB)

For inquiries, contact DOST-PCAARRD

 (049) 554-9670 or 536-1574

 pcaarrd@pcaarrd.dost.gov.ph

WiltCURE™ Biopesticide for Solanaceous Crops

Effective in **controlling plant disease** caused by *Fusarium oxysporum* (Foc TR4) or Fusarium Wilt on solanaceous crops, particularly on tomato, eggplant, and hot pepper



<https://www.garden.eco/eggplant-spacing>



TRL	6
IRL	4
ROI/IRR	69 %
PAYBACK	2.86 years
INVESTMENT	Php 16.12M

TECHNOLOGY GENERATOR
 Dr. Eufrocinio C. Marfori
 National Institute of Molecular Biology
 and Biotechnology (BIOTECH-UPLB)

For inquiries, please contact DOST-PCAARRD
 ☎ (049) 554-9670 or 536-1574
 ✉ pcaarrd@pcaarrd.dost.gov.ph

Controlled-Release Nitrogen Fertilizer (CRNF)

CRNF utilizes the inherent properties of nanofertilizer, such as controlled release of nitrogen (N) and using greater surface area for higher absorption rate. It **reduces use of fertilizers up to 50%**



TRL	6
IRL	6
ROI/IRR	21 %
PAYBACK	6.6 years
INVESTMENT	Php 13.9M

TECHNOLOGY GENERATOR
 Dr. Lilia M. Fernando
 National Institute of Molecular Biology and Biotechnology
 (BIOTECH-UPLB)

For inquiries, please contact DOST-PCAARRD
 ☎ (049) 554-9670 or 536-1574
 ✉ pcaarrd@pcaarrd.dost.gov.ph

BioGreen Plus (Kakawate Microbial Inoculant)

Increases germination rate of hard to germinate seeds of onions, celery, carrot and coriander



https://harvesttotable.com/how_to_grow_coriander_and_cila/



<https://www.goodhousekeeping.com/home/gardening/a20705702/how-to-grow-carrots/>

TRL

5

IRL

5

TECHNOLOGY GENERATOR
Dr. Blesilda M. Calub
University of the Philippines Los Baños (UPLB)

For inquiries, please contact DOST-PCAARRD
☎ (049) 554-9670 or 536-1574
✉ pcaarrd@pcaarrd.dost.gov.ph

BioGreen Plus (Kakawate fertilizer for chili pepper, tomato, cucumber, eggplant & squash)

An organic liquid plant supplement used for **improving the flowering and fruiting** of various plants.



<https://mypatriotssupply.com/products/organic-hot-cayenne-long-red-thin-pepper-seeds>



https://harvesttotable.com/growing_squash/



<https://www.gardeners.com/how-to/selecting-the-right-tomato-variety/5259.html>

TRL

5

IRL

5

TECHNOLOGY GENERATOR

Dr. Blesilda M. Calub
University of the Philippines Los Baños (UPLB)

For inquiries, please contact DOST-PCAARRD

 (049) 554-9670 or 536-1574

 pcaarrd@pcaarrd.dost.gov.ph

Hi-Yeast Biocontrol Agent for Fruits and Vegetables

A yeast-based biocontrol agent (BCA) that **prevents fruit and vegetable decay** caused by fungal and bacterial pathogens during postharvest handling



<https://www.listph.com/2015/06/list-of-fruits-in-philippines.html>



TRL	6
IRL	5
ROI/IRR	53.88 %
PAYBACK	1.86 years

TECHNOLOGY GENERATOR
Dr. Severina Exconde
National Institute of Molecular Biology and Biotechnology
(BIOTECH-UPLB)

For inquiries, please contact **DOST-PCAARRD**
☎ (049) 554-9670 or 536-1574
✉ pcaarrd@pcaarrd.dost.gov.ph

GRAS “Generally Regarded As Safe” Coatings for Vegetables

Coatings derived from phytochemical extracts to **enhance the shelf-life** of highly perishable vegetables



TRL	5
IRL	4
ROI/IRR	36%
PAYBACK	4.3 years
INVESTMENT	Php 4.5M

TECHNOLOGY GENERATOR
Dr. Marcelo A. Quevedo
Visayas State University

For inquiries, please contact DOST-PCAARRD
☎ (049) 554-9670 or 536-1574
✉ pcaarrd@pcaarrd.dost.gov.ph

FRUITECT: BIOCOMPOSITE COATING FOR FRUITS

A liquid coating formulation that delays the ripening and extends the shelf life of fruits such as mango, papaya, pineapple, and banana.



TRL

5

IRL

4

- green technology
- easy-to-apply formulation

TECHNOLOGY GENERATOR

Dr. Hidelisa Hernandez & Dr. Veronica Sabularse
University of the Philippines Los Baños (UPLB)

For inquiries, please contact DOST-PCIEERD

☎ 837-2071 to 82 loc. 2100, 2120 & 2121

✉ pcieerd@pcieerd.dost.gov.ph

Abaca Bunchy Top Virus (ABTV) Diagnostic Kit

A diagnostic kit with antiserum to specifically detect the presence of the Abaca Bunchy Top Virus



<https://flyingketchup.ph/jap-affiliated-company-develop-10000-hectare-abaca-plant-marawi/>

TRL

6

IRL

2

The generated antibody can detect infection even in the lowest concentration.

TECHNOLOGY GENERATOR

Dr. Edgardo E. Tulin
Visayas State University

For inquiries, please contact DOST-PCAARRD

☎ (049) 554-9670 or 536-1574

✉ pcaarrd@pcaarrd.dost.gov.ph

DNA- NanoBiosensor

Accurate and rapid detection system of bacterial pathogens such as the E.coli, E. coli 0157:H7, and Salmonella enterica in food, feed, and farm produce

**TRL****4****IRL****3****TECHNOLOGY GENERATOR**

Dr. Francisco Elegado
National Institute of Molecular Biology
and Biotechnology (BIOTECH-UPLB)

For inquiries, contact DOST-PCIEERD

☎ 837-2071 to 82 loc. 2100, 2120 & 2121

✉ pcieerd@pcieerd.dost.gov.ph

Infrared Grain Dryer for Rice

A new rapid-drying technology for paddy using far-infrared technology with an **average milling recovery of 69.5% and head rice yield of 47%**



TRL

6

IRL


5

TECHNOLOGY GENERATOR

Dr. Manuel Jose C. Regalado
Philippine Rice Research Institute

For inquiries, contact DOST-PCAARRD

 (049) 554-9670 or 536-1574

 pcaarrd@pcaarrd.dost.gov.ph

Impeller Rice Mill for Brown & White Rice

Speeds up the milling process with its **milling capacity of 230kg/hour**. It is capable of producing both white and brown rice with milling recovery higher by 5% as compared with “Kiskisan”



TRL	6
IRL	8
ROI/IRR	60 %
PAYBACK	1.1 years
INVESTMENT	Php 4.1M

TECHNOLOGY GENERATOR

Mr. Michael A. Gragasin
 Philippine Center for Postharvest Development
 and Mechanization (PhilMech)

For inquiries, please contact DOST-PCAARRD

☎ (049) 554-9670 or 536-1574

✉ pcaarrd@pcaarrd.dost.gov.ph

Forage-based Pellet Feeds for Goats

Bite-sized pieces of sundried, compressed, and **nutritionally-balanced mixture of forage and grain ingredients** such as ipil-ipil, rice bran, copra, and molasses.



TRL	8
IRL	6
ROI/IRR	108 %
PAYBACK	3.6years
INVESTMENT	Php3.3M

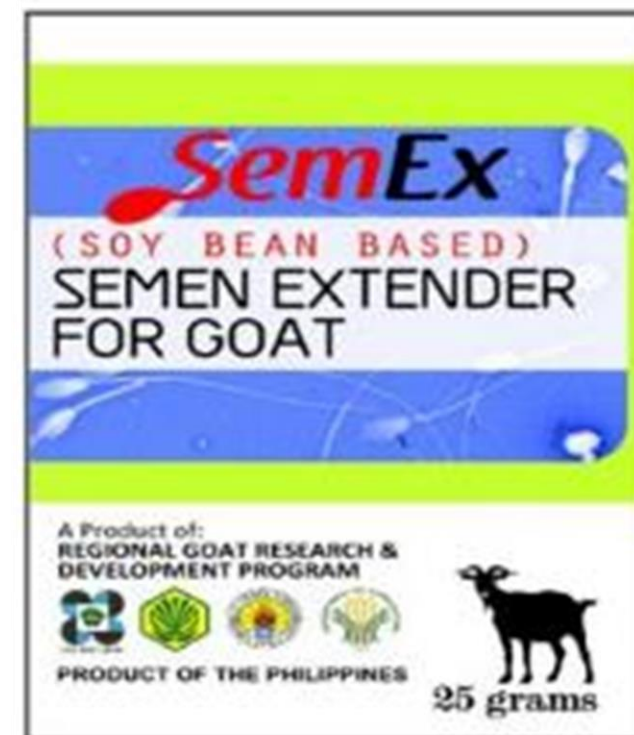


TECHNOLOGY GENERATOR
Dr. Edgar A. Orden
Central Luzon State University

For inquiries, contact DOST-PCAARRD
☎ (049) 554-9670 or 536-1574
✉ pcaarrd@pcaarrd.dost.gov.ph

Semen Extender for Goat

Soybean-based, effective in **lengthening the viability of the goat spermatozoa** under refrigerated storage **from 48 to 110 hours** and increasing post thaw motility to as high as 60%.



TRL

5


IRL


5

TECHNOLOGY GENERATOR

Ms. Aubrey Joy Balbin
Isabela State University

For inquiries, contact DOST-PCAARRD

 (049) 554-9670 or 536-1574

 pcaarrd@pcaarrd.dost.gov.ph

Microalgal Paste

A concentrate of liquid microalgae cells, used in nurseries as **feed for larval fish, shrimp, and other aquaculture species**; easy to apply and can be provided to the stock anytime; can be refrigerated for several months without decreasing its nutritional quality.



TRL	8
IRL	5
ROI/IRR	30 %
PAYBACK	2 years
INVESTMENT	Php 3.19M

TECHNOLOGY GENERATOR
 Solidad S. Garibay
 University of the Philippines Visayas

For inquiries, contact DOST-PCAARRD
 ☎ (049) 554-9670 or 536-1574
 ✉ pcaarrd@pcaarrd.dost.gov.ph

LAMP kit for Shrimp Pathogens

10x more sensitive in detecting White Spot Syndrome Virus (WSSV), and can provide results **within 1 hour**



TRL

9

IRL

8

<https://priyankaorganica.wordpress.com/2015/01/22/white-spot-syndrome-viruswssv-is-most-virulent-pathogen-of-peaneid-shrimp-causes-high-death-rate-of-shrimps/>

TECHNOLOGY GENERATOR

Dr. Mary Beth B. Maningas
University of Santos Tomas

For inquiries, contact DOST-PCAARRD

 (049) 554-9670 or 536-1574

 pcaarrd@pcaarrd.dost.gov.ph

Biosensor Kit for Shrimp

An **affordable, rapid and easy to use detection kit** for diagnosis of white spot syndrome virus and other pathogens in shrimps

TRL

5

IRL

5



https://www.eurekalert.org/pub_releases/2016-05/uos-cte053016.php



TECHNOLOGY GENERATOR

Mr. Erwin P. Enriquez
Ateneo de Manila University

For inquiries, contact DOST-PCAARRD

(049) 554-9670 or 536-1574

pcaarrd@pcaarrd.dost.gov.ph

Automatic Surface Feeder

Designed to distribute feeds at the water surface; has a straight feed spreader to cover a larger area when feed is dispensed

TRL

4

IRL

5

Reduce production cost (through reduced labor cost), improve product quality, and minimize waste by maximizing feed utilization.



TECHNOLOGY GENERATOR

Prof. Valeriano L. Corre Jr.
University of the Philippines Visayas

For inquiries, please contact DOST-PCAARRD

☎ (049) 554-9670 or 536-1574

✉ pcaarrd@pcaarrd.dost.gov.ph

MILKFISH Automatic Fry Counter

A laser fry counting with **95% accuracy** and a counting rate of 6 pieces per second



<http://coraltriangle.blogs.panda.org/coral-triangle/fish-for-the-millions-milkfish-aquaculture-sarangani-philippines>



TRL 4
IRL 5



TECHNOLOGY GENERATOR

Prof. Valeriano L. Corre Jr.
University of the Philippines Visayas

For inquiries, please contact DOST-PCAARRD

☎ (049) 554-9670 or 536-1574

✉ pcaarrd@pcaarrd.dost.gov.ph

Fish-I

Uses artificial intelligence for fish visual census and rapid reef fish assessment.



TRL

5

IRL

5

provides a quicker, safer, and more accurate method to automate the process of performing fish census

TECHNOLOGY GENERATOR

Dr. Prospero C. Naval
University of the Philippines Diliman

For inquiries, please contact DOST-PCIEERD

☎ 837-2071 to 82 loc. 2100, 2120 & 2121

✉ pcieerd@pcieerd.dost.gov.ph

Automated Rapid Reef Assessment System (**ARRAS**)

Provides a **fast and diverless method of coastal survey and mapping services** for creating permanent visual records of the marine environment.



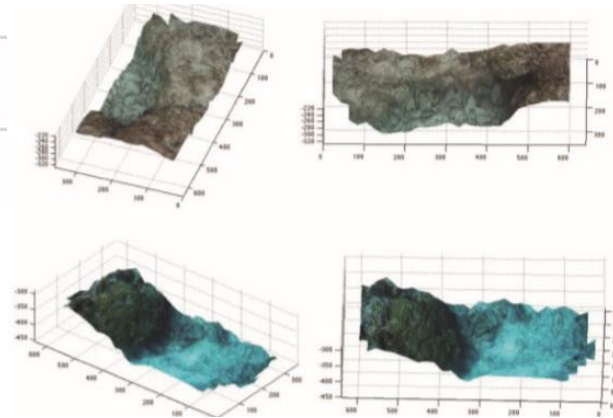
TRL

5

IRL

5

- Teardrop
- Kiko&Stitch



TECHNOLOGY GENERATOR

Dr. Maricor N. Soriano
University of the Philippines Diliman

For inquiries, please contact DOST-PCIEERD

☎ 837-2071 to 82 loc. 2100, 2120 & 2121

✉ pcieerd@pcieerd.dost.gov.ph

STABILIZED Brown RICE

- Extended **shelf-life of 4-9 months**
- Retained **fiber content, B-vitamins and minerals** which help address lifestyle-related diseases and mineral deficiencies
- Improved texture
- Shorter cooking time



NUTRITION INFORMATION

Serving Size 67 g
Servings per pack 7

	Amount per Serving	Amount per 100 g
Energy (Calories)	250	370
Total Fat (g)	2	3
Total Carbohydrates (g)	53	78
Total Dietary Fiber (g)	2	3
Total Protein (g)	5	8
Sodium (g)	0	5
		Amount per Serving
Calcium (mg)	19	3
Iron (mg)	1	5
Zinc (mg)	1	18

Base on RNI for Male 18 years old and above

Patent registered
(Reg. No. 1-2012-000394)

ROI/IRR

36 %

PAYBACK

2 years

INVESTMENT

**Php 0.8M-2M
equipment**

SRP

Php 45.00-50.00



+ Stabilization technology

Improved shelf-life

Improved texture

Shorter cooking time

**FOR INQUIRIES,
WRITE OR CALL**

Dr. Mario V. Capanzana

 mvc@fnri.dost.gov.ph

 www.fnri.dost.gov.ph

 (02) 837-2934

 [www.facebook.com/
DOST.FNRI](http://www.facebook.com/DOST.FNRI)

Technology Licensing Fee: P50,000.00

Royalty fee: 2% based on gross sales

Drum Drying Technology

The technology allows liquid with low viscosities like fruit purees to dry out at relatively low temperatures over rotating drums producing drum-dried crunchy sheets or flakes.

TRL	5
IRL	4
ROI/IRR	64 %
PAYBACK	1.69 years
INVESTMENT	Php 6.75M
SRP	Php 45.00 (50g)



MANGO FLAKES
IP FILED- UTILITY MODEL
2-2016-050007



MAKAPUNO FLAKES
IP FILED- UTILITY MODEL
2-2016-050023



BANANA FLAKES
IP FILED- UTILITY MODEL
2-2016-050011



**FOR INQUIRIES,
WRITE OR CALL**

Dr. Annabelle V. Briones

 avbriones@itdi.dost.gov.ph
avbriones2003@yahoo.com

 www.itdi.dost.gov.ph

 (02) 837-2071 local 2218

Wine Barrel from Santol and Other Local Wood Species



TRL	5
IRL	1
ROI/IRR	46%/ 44%
PAYBACK	4 years
INVESTMENT	Php 1.27M

**FOR INQUIRIES,
CALL**

Dr. Romulo T. Aggangan

 www.fprdi.dost.gov.ph

 (049) 536-2377; 536-2360
536-3630; 536-2586

Multipurpose Double Acting Hot Press



TRL	5
IRL	1
ROI/IRR	80%/ 84%
PAYBACK	1 year
INVESTMENT	Php 360,000.00

**FOR INQUIRIES,
CALL**

Dr. Romulo T. Aggangan

 www.fprdi.dost.gov.ph

 (049) 536-2377; 536-2360
536-3630; 536-2586

Nano Clay Technology

Utility Model 2-2011-000679

A **multifunctional additive or filler** in POLYMER Nanocomposites, processed from local bentonite ore via organic activation



Nanoclay is the commercial name for organoclay or organo-montmorillonite.

REDUCED COST by up to 20%

TRL	4
IRL	4
ROI/IRR	25 %
PAYBACK	3.5 years
INVESTMENT	Php 6.5M manpower & equipment
SRP	Php 14,700/25kg

APPLICATIONS:

- Aviation
- Automotive
- Packaging
- Construction

BETTER PERFORMANCE:

- Modulus and tensile strength
- Barrier properties
- Dimensional stability
- Flame retardancy
- Recyclability

**FOR INQUIRIES,
WRITE OR CALL**

Dr. Annabelle V. Briones

 avbriones@itdi.dost.gov.ph
avbriones2003@yahoo.com

 www.itdi.dost.gov.ph

 (02) 837-2071 local 2218

MONASCUS Colorant

A non-toxic, non-mutagenic, **food safe colorant** for food, feed, beverage and cosmetics



<https://www.wideopeneats.com/red-white-blue-drinks-youll-need-fourth-july/>



TRL

4

IRL

4

ROI/IRR

21.33 %

PAYBACK

4.69 years

INVESTMENT

Php 61.4M



<https://www.colourbox.com/image/makeup-powder-in-three-colors-on-white-background-image-2859766>

TECHNOLOGY GENERATOR

Dr. Fides Tambalo
National Institute of Molecular Biology
and Biotechnology (BIOTECH-UPLB)

For inquiries, please contact DOST-PCIEERD

☎ 837-2071 to 82 loc. 2100, 2120 & 2121

✉ pcieerd@pcieerd.dost.gov.ph

UPLB Microbial Rennet

A milk coagulant for cheese production that has the same characteristics and efficacy as animal rennet



TRL

7

IRL

6

PAYBACK

1.5years

ROI/IRR

GRANULATED:
42.66 %

LIQUID:
62.96 %

INVESTMENT

Php 4.5M

Php 1.7M

TECHNOLOGY GENERATOR

Dr. Susan Mercado
National Institute of Molecular Biology
and Biotechnology (BIOTECH-UPLB)

For inquiries, please contact DOST-PCIERD

☎ 837-2071 to 82 loc. 2100, 2120 & 2121

✉ pcieerd@pcieerd.dost.gov.ph

NIPA Sugar

An **alternative sweetener from nipa sap** using a sanitized system of collecting nipa sap and optimized process of converting sap to sugar



TRL	6
IRL	6
ROI/IRR	37 %
PAYBACK	4 years
INVESTMENT	Php 12M

(1,000L capacity production/ day)

TECHNOLOGY GENERATOR
Dr. Violeto N. Coronacion
Southern Luzon State University-Infanta

For inquiries, please contact DOST-PCIEERD
☎ 837-2071 to 82 loc. 2100, 2120 & 2121
✉ pcieerd@pcieerd.dost.gov.ph

OYSTER Powder

An alternative product from oysters that can be shelf-stable, retaining the rich vitamins and minerals in oysters, used as seasoning for dishes or base component for sauces and mixes



TRL	4
IRL	2
PAYBACK	1 year
INVESTMENT	Php 6.6M

TECHNOLOGY GENERATOR
Ms. Ernestina M. Peralta
University of the Philippines Visayas

For inquiries, please contact DOST-PCIEERD
☎ 837-2071 to 82 loc. 2100, 2120 & 2121
✉ pcieerd@pcieerd.dost.gov.ph

COMPACT WASTEWATER TREATMENT SYSTEM FOR QUICK SERVICE RESTAURANTS (QSRS)

A low cost, sustainable, **compact wastewater treatment system** that can be used to treat high organic wastewater coming from stand-alone quick service restaurants (QSR).

Treatment Performance		
Parameter	Influent	Effluent
BOD, mg/L	600 - 1200	10 - 40
TSS, mg/L	120 - 600	12 - 50
Surfactant, mg/L	up to 10	0.1 - 1.0
Oil & Grease, mg/L	up to 1000	0.5 - 1.5
pH	3.5 - 6.0	6.5 - 7.5

TRL	4
IRL	4
ROI/IRR	76 %
PAYBACK	1.4 years
INVESTMENT	Php 845,000.00
SRP	Php 320,000/unit



**FOR INQUIRIES,
WRITE OR CALL**

Dr. Annabelle V. Briones

 avbriones@itdi.dost.gov.ph
avbriones2003@yahoo.com

 www.itdi.dost.gov.ph

 (02) 837-2071 local 2218

ORGANOMINERAL

A formulation from naturally occurring organominerals **reduces smell and muddy color in wastewaters and septic waters**. Its application stimulates growth of indigenous aerobic microorganisms in wastewater and boost the degradation of organic pollutants.



TRL

9

IRL

9

The use of organominerals significantly improves water quality based on the effluents standards set by DENR

TECHNOLOGY GENERATOR

Dr. Merlinda A. Palencia
Adamson University

For inquiries, please contact DOST-PCIEERD

☎ 837-2071 to 82 loc. 2100, 2120 & 2121

✉ pcieerd@pcieerd.dost.gov.ph

Charging in Minutes (CHARM)

A **fast charging system** that can fully charge electric tricycles **in 30 Minutes**



TRL	5
IRL	4
ROI/IRR	57 %
INVESTMENT	Php 6.5M

TECHNOLOGY GENERATOR

Prof. Lew Tria
University of the Philippines Diliman

For inquiries, please contact DOST-PCIEERD

☎ 837-2071 to 82 loc. 2100, 2120 & 2121

✉ pcieerd@pcieerd.dost.gov.ph

JOLT

A **smart, portable and high energy** capacity pack up power device with 3-5 hrs max power use; handy during emergency response



TRL

4

IRL

4

TECHNOLOGY GENERATOR

Dr. Joey Ocon
University of the Philippines Diliman

For inquiries, please contact DOST-PCIEERD

☎ 837-2071 to 82 loc. 2100, 2120 & 2121

✉ pcieerd@pcieerd.dost.gov.ph

GITARA ni Juan

Standardized process of guitar making that addresses the problems relating to manufacturing inconsistencies, intonation, sound quality, and playability in locally made guitars.

**TRL****4****IRL****4****TECHNOLOGY GENERATOR**

Engr. Crison Lucas
University of the Philippines Diliman

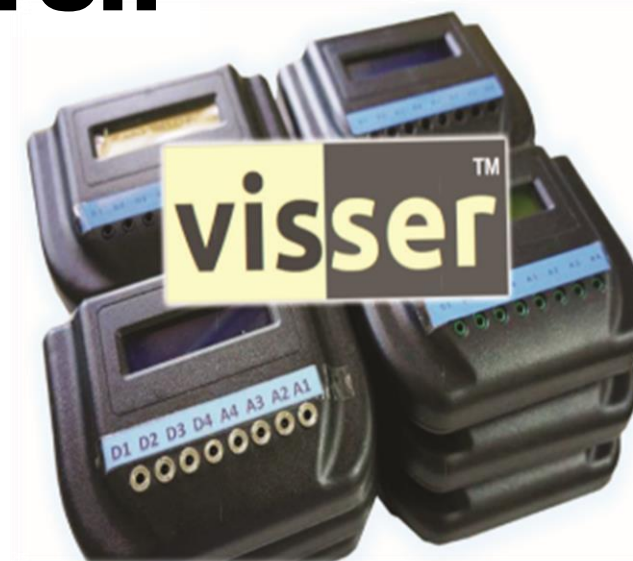
For inquiries, please contact DOST-PCIEERD

☎ 837-2071 to 82 loc. 2100, 2120 & 2121

✉ pcieerd@pcieerd.dost.gov.ph

Versatile Instrumentation System for Science Education and Research

A handheld device, consists of analog and digital sensors that act as a central hub to which different sensors can be connected and controlled to perform various science experiments.



TRL

5

IRL

4

- data storage, control, interface, and analysis tools for the users
- can be used without a computer, and it can be powered by battery or powerbank

TECHNOLOGY GENERATOR

Dr. Giovanni Tapang
University of the Philippines Diliman

For inquiries, please contact DOST-PCIEERD

837-2071 to 82 loc. 2100, 2120 & 2121

pcieerd@pcieerd.dost.gov.ph

SMART SURFACE

an electronic sensor system that converts virtually any flat surface into a tap-sensitive device similar to the touch surface of smartphones and tablets



TRL

5

IRL

4

TECHNOLOGY GENERATOR

Dr. Nestor Tiglao
University of the Philippines Diliman

For inquiries, please contact DOST-PCIEERD

☎ 837-2071 to 82 loc. 2100, 2120 & 2121

✉ pcieerd@pcieerd.dost.gov.ph

Universal Structural Health Evaluation and Recording (**USHER**)

A 24/7 economical and hassle-free system that provides advanced decision support tools to building managers and officials of local government units for structural health monitoring and management.



TRL

5

IRL

5

TECHNOLOGY GENERATOR

Dr. Francis Aldrine Uy
MAPUA University

For inquiries, please contact DOST-PCIEERD

☎ 837-2071 to 82 loc. 2100, 2120 & 2121

✉ pcieerd@pcieerd.dost.gov.ph

AQUOSENSE

Offers a rapid, easy-to-use water quality sensor system comprising of electronic sensors for measuring pH, dissolved oxygen, conductivity, turbidity, temperature, salinity and ammonia level quantitatively in real-time



TRL	4
IRL	3

An automated water quality monitoring system

TECHNOLOGY GENERATOR
 Engr. Jose Monje
 Ateneo de Manila University (ADMU)

For inquiries, please contact DOST-PCIEERD
 ☎ 837-2071 to 82 loc. 2100, 2120 & 2121
 ✉ pcieerd@pcieerd.dost.gov.ph

ANEEME

A virtual reality app that uses human hands as input device. ANEEME uses sensors to detect the skeletal system of the user which the app uses to produce its in-game dummy or avatar.



TRL	4
IRL	3

This output can be used for animations in games and virtual reality applications within minutes.

TECHNOLOGY GENERATOR

Dr. Rowel Atienza
University of the Philippines Diliman

For inquiries, please contact DOST-PCIEERD

☎ 837-2071 to 82 loc. 2100, 2120 & 2121

✉ pcieerd@pcieerd.dost.gov.ph

Herbal Drug for Dengue

Herbal drug that has been proven effective during pre-clinical trials in controlling symptoms of dengue hemorrhagic fever

**TRL****5****IRL****2**

No Business Plan yet

TECHNOLOGY GENERATOR

Dr. Rita Grace Alvero

De La Salle Health Sciences Institute

BIOTEK-M

Affordable rapid test kit for **accurate detection of dengue infection within an hour**



TRL

9

IRL

8


has high sensitivity, high specificity, robust, and is less expensive than current diagnostic tests in the market

TECHNOLOGY GENERATOR

Dr. Raul V. Destura
University of the Philippines Diliman

For inquiries, please contact UP Manila

Dr. Lourdes Marie Tejero

 (02)310-5731

 lstejero@up.edu.ph

RxBox

A **telemedicine device for capturing medical signals** via built-in medical sensors, storing data in electronic medical record and transmit health info via internet to a clinical specialist



TRL	7
IRL	5

TECHNOLOGY GENERATOR

Dr. Portia Grace Marcelo
National Telehealth Center – UP Manila

ReliefVent

A compact, easy to use, volume cycled servo ventilator; AC or DC powered; has embedded software for self-diagnostic cloud-based data analytic, with protocols for operations and troubleshooting



TRL

6

IRL

3

TECHNOLOGY GENERATOR

Dr. Abundio Balgos
University of the Philippines Manila

Axis Knee System

An affordable, high-quality and FDA-approved total knee preplacement system specifically designed for Asians.



TRL	9
IRL	9

Its instrumentation and surgical technique allows surgeons to perform the procedure accurately, eliminating the possibility of implant failure.

TECHNOLOGY GENERATOR

Dr. Ramon Gustilo
Orthopedic International Inc.

For inquiries, please contact Orthopedic International Inc.

Engr. Jude Sasing

 (02)885-7281 to 82

 jude.sasing@oii.com

eHealth Tablet for Informed Decision Making of LGUs (eHATID)

a software application that provides health Information system (HIS) and decision-making support to LGUs through an Electronic Medical Record (EMR) that generates particular health reports for the DOH and the PhilHealth

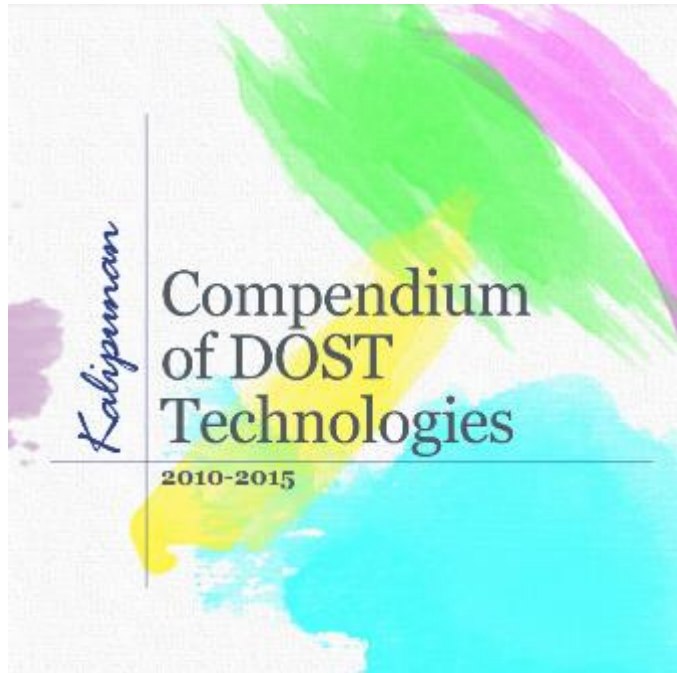


TRL	8
IRL	6

TECHNOLOGY GENERATOR
Dr. Dennis Batangan
Ateneo de Manila University (ADMU)

For inquiries, please contact ADMU
Dr. Proceso L. Fernandez Jr.
☎ (02) 426-6001 loc. 5660
✉ pfernandez@ateneo.edu

Booklet of DOST Technologies



<https://drive.google.com/file/d/0B8N3ku85M6nmeWpvTThYcE9yTDg/view>

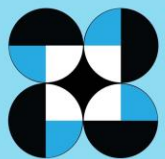


<http://www.dost.gov.ph/phocadownload/Downloads/Journals/Technology%20Transfer%20Day%20Booklet%20of%20Technologies0.pdf>



Moving Forward, MAP may consider

- Adopting DOST technologies “as is, where is”
- Volunteering as mentors to startups and spinoffs for DOST technologies
- Helping DOST value technologies
- Commercializing DOST technologies



DEPARTMENT OF SCIENCE AND TECHNOLOGY

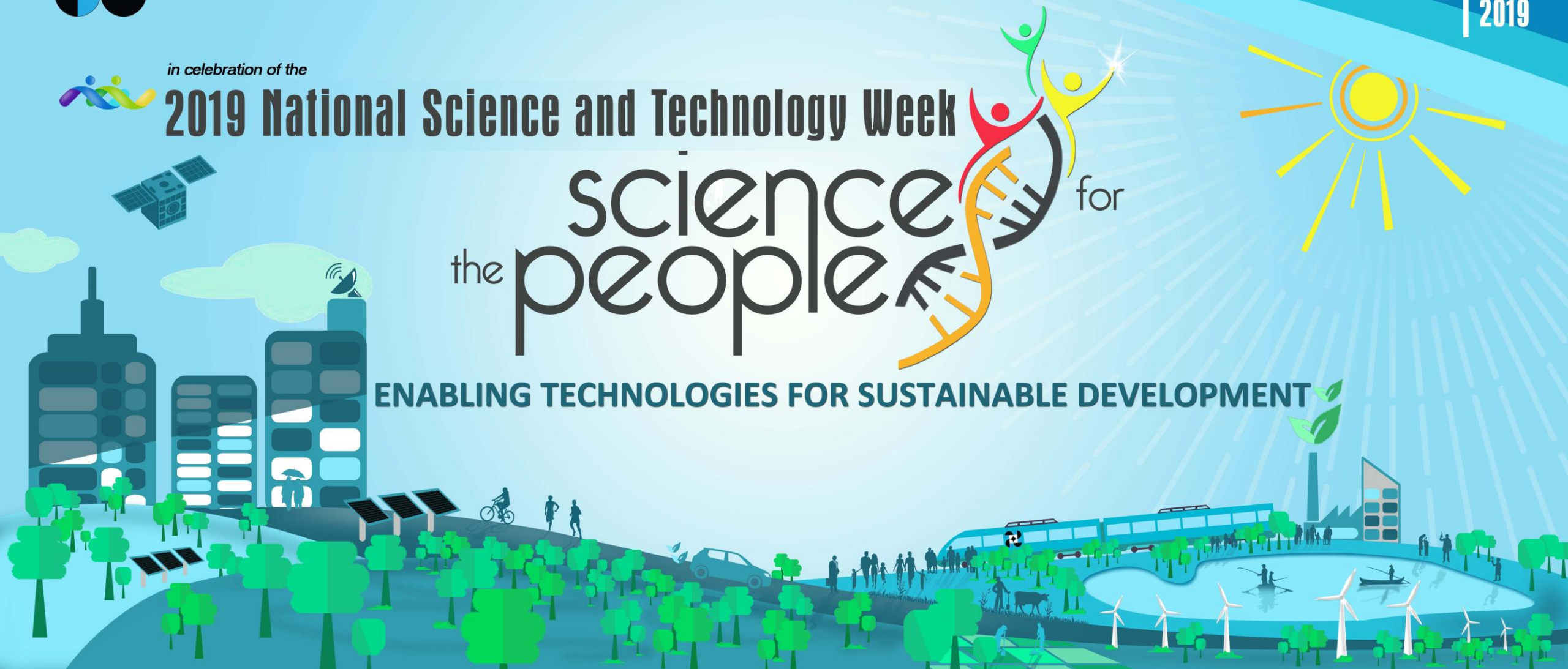
World Trade Center
Pasay City | 17-21
July
2019

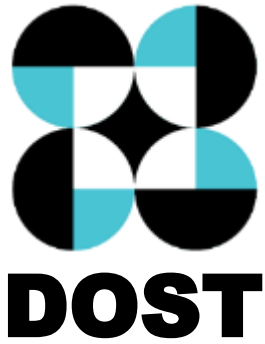
in celebration of the

2019 National Science and Technology Week

the science people for

ENABLING TECHNOLOGIES FOR SUSTAINABLE DEVELOPMENT



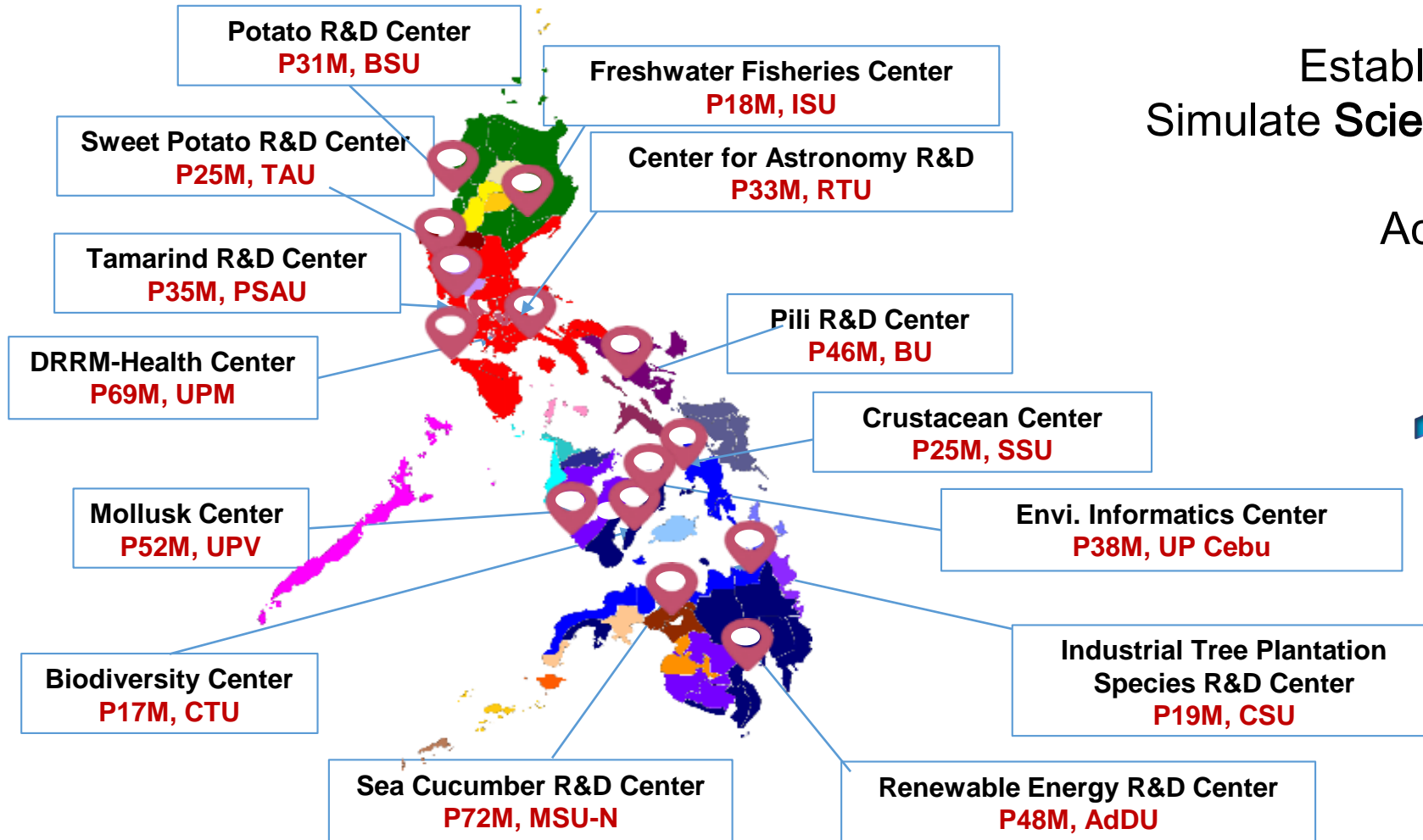


*Science for Change (S4C)
Program*

NICER

Niche Centers in the Regions for R&D

Establish R&D Centers in the Regions
Simulate Science, Technology and Innovation
and
Accelerate Regional Development



14 APPROVED
NICER
P 528M

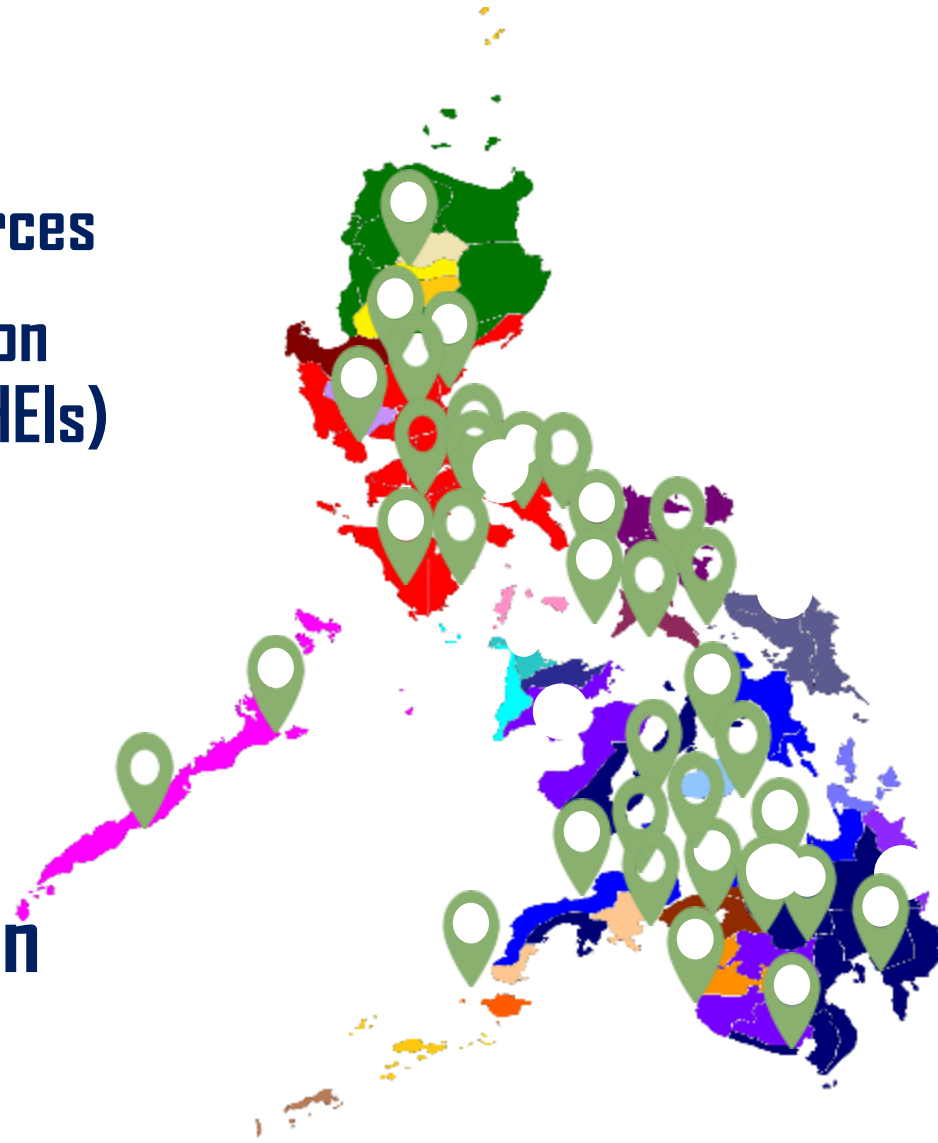


1 Country
 17 Regions
 with unique Resources

1,943* Higher Education
 Institutions (HEIs)

VISION

1
 Center per Region
 per Year



NICER	Approved	In Pipeline (2019)
CAR	White Potato	
I		Innovative Materials, Garlic
II	Freshwater Fisheries	Citrus
III	Sweet Potato, Tamarind	
NCR	DRRM-Health, Astronomy	
IVA		Metals & Wood Works
IVB		Native Pig, Marble
V	Pili	Queen Pineapple
VI	Mollusk	
VII	Biodiversity, Informatics	
VIII	Crustaceans	
IX		Native Chicken
X	Seacucumber	
XI	Renewable Energy	
XII		Halal Goat
CARAGA	Industrial Trees	
BARMM		Seaweeds

64 CENTERS by 2022 NATIONWIDE

CRADLE

Collaborative Research and Development to Leverage Philippine Economy

CRADLE Program creates synergistic relationship between the academe and the industry with the goal of invigorating Philippine R&D

Industry to identify a problem

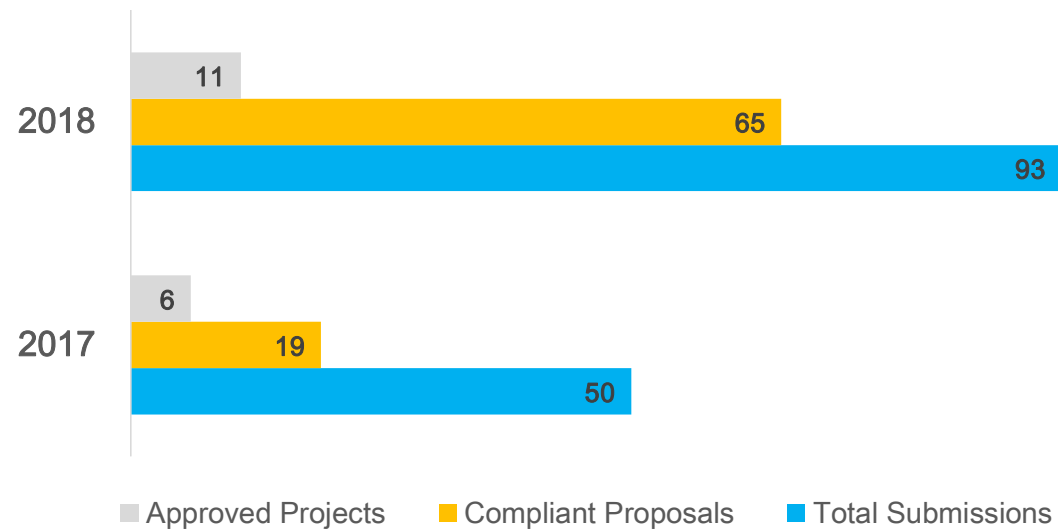


Partner HEI or RDI to undertake the necessary R&D to find solution



- ✓ Partner company will adopt the R&D output
- ✓ Partner company will provide 20% counterpart*

- ✓ Maximum funding is 5M, for 1 to 3 years
- ✓ HEI/RDI should have at least 1 partner company



Call for Proposals by the Numbers

about 1 out of 4 (24%) compliant proposals were approved during 2017 – Q2 2019

More than Php 62 M granted

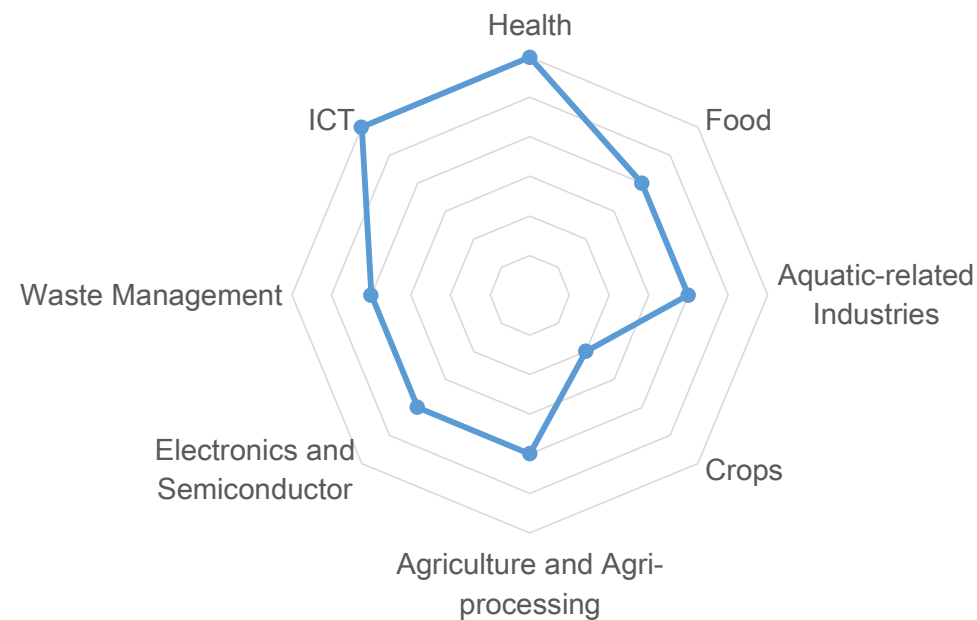
Total amount of project grants from 2017 to Q2 2019

17 Approved CRADLE Projects

From 2017 to Q2 2019; with 5 projects in the pipeline for Q2 2019

8 Regional CRADLE Caravans

Aimed at inclusive regional growth and catered to more than 500 industry and academe participants















Sectoral Engagement

based on number of approved projects from 2017 – Q2 2019

GRANTEES



Agriculture, Aquatic & Natural Resources

REGION	R&D Scope	UNIVERSITY (MAIN PROPONENT)	
XI	Development of Banana Diseases Surveillance System	University of Southeastern Philippines and HIJO Resources Corporations	 
IV-A	Micropropagation of Selected Genetically-verified, Superior Bamboo	UPLB and Carolina Bamboo Garden	 
NCR	Development of Aquafeed from “ <i>Lab-lab</i> ”	DLSU and SANTEH Feed Corporation	 
XI	Production of Food Grade, Pharmaceutical-Grade and Polymer Grade Lactic Acid	UP Mindanao and Monde Nissin Corporation	 
III	Development of Decontaminating Machine of Rice Hull as Litter Floor for Broiler Breeder Production	Central Luzon State University and Cobb-Vantress Phil. Inc.	 
VI	Fish Hydrolysates from Marine Fish Species	UP Visayas and Pascual Pharma Corp.	 

Health, Food and Food Industry

REGION	R&D Scope	UNIVERSITY (MAIN PROPONENT)
NCR	Development of Egg White Powder and Granules from Low Value Chicken Eggs	UPD and Batangas Egg Producers Cooperative
IV-A	Incorporating Prebiotics and Probiotics in Ice Cream	UPLB and Sugar and Ice Confections Inc.
VI	Biochemical Profiling of Pineapple Wastes as Source of New Bioactive Compounds	University of San Agustin and Del Monte Philippines
NCR	Wastewater Treatment Technology	ITDI and Central Macaroni Co. Inc., (CENMACO)
NCR	Development of Novel Radiopharmaceuticals for Management and Detection of Early Stage Prostate Cancer	PNRI and Rocket Heath Inc.



CENMACO



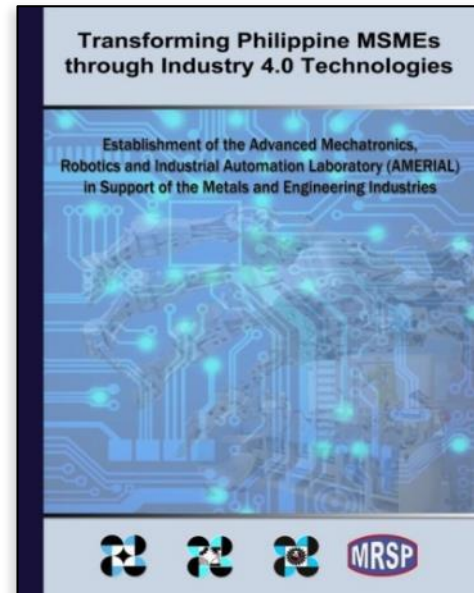
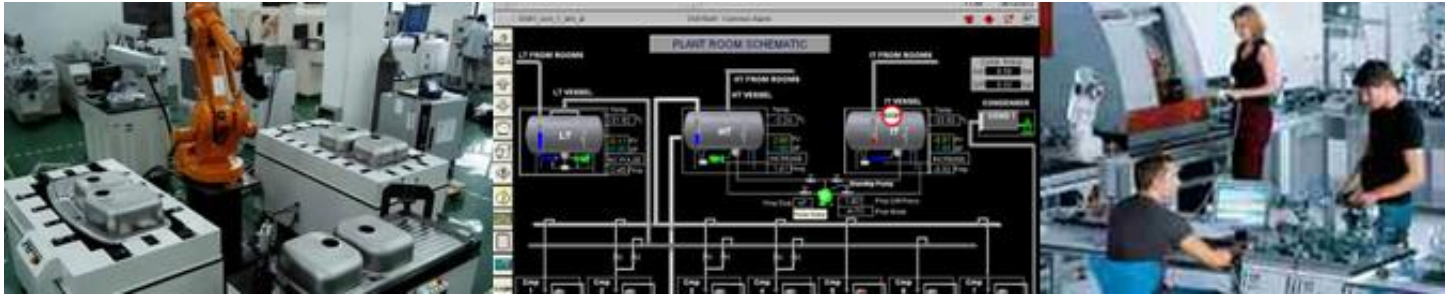
Materials, ICT and Electronics

REGION	R&D Scope	UNIVERSITY (MAIN PROPONENT)
NCR	Remote Monitoring System for Environmental Conditions in Sambong Plantation	TIP- Manila and Pascual Pharma Corp.
XI	Wireless/Card-Based Payment System for Solar Home System	University of Southeastern Philippines and LeadTech Inc.
NCR	Enhancement of Plasma Enhanced Chemical Vapor Deposition Industrial Prototype for Nitride- Based Coatings	UPD and Asian Semiconductor Electronics Technologies (ASET) Corporation
IV-A	Development of a Design Guideline to Evaluate the Soundness of Semiconductor Packaging Design	DLSU-Laguna and Integrated Micro-Electronics Inc (IMI)
II	Demeter's Eye: An Embedded System for Detection and Mapping of Witchbroom's Disease on Cassava	Isabela State University and EDCOR Development Cooperative
NCR	ZURFACE: Surface Modification of Natural Zeolite for the Adsorption of Textile Dye Waste	DLSU and Saile Industries



Advanced Mechatronics, Robotics, and Industrial Automation Laboratory (AMERIAL)

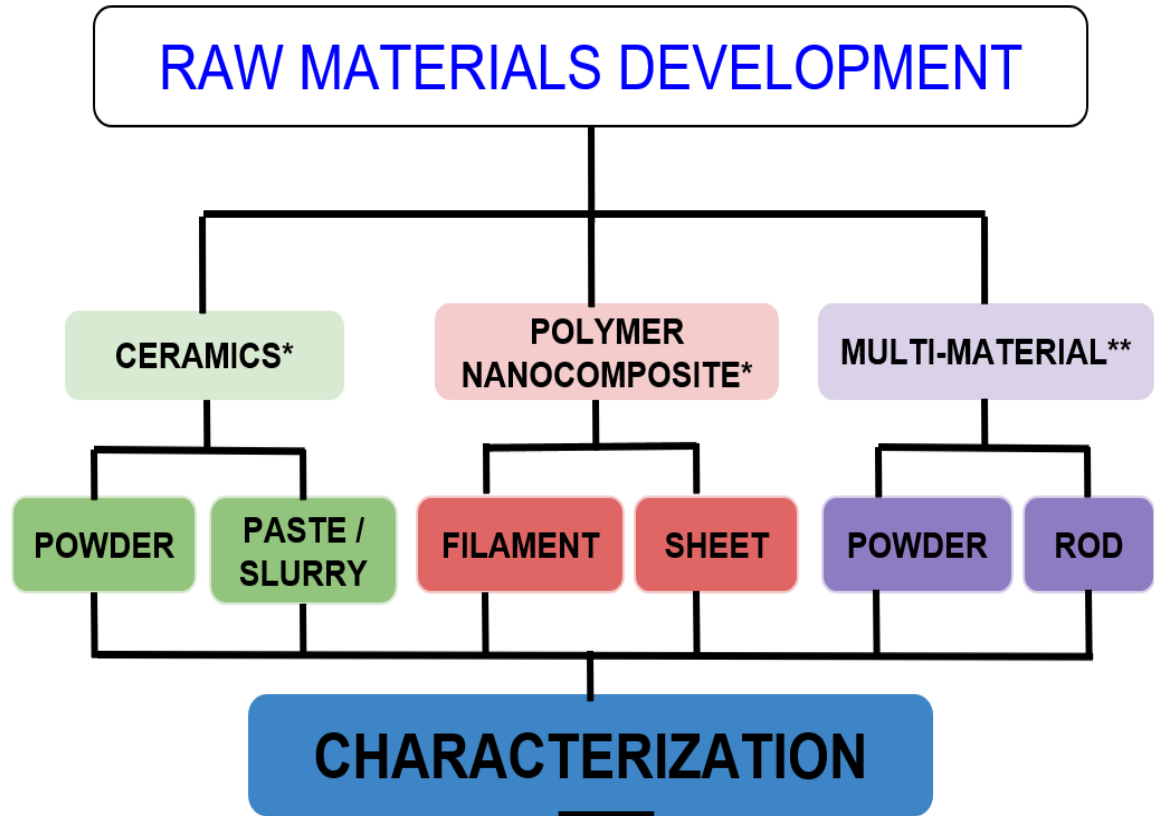
A laboratory that serves as a training and innovation hub on advanced mechatronics, robotics and industrial automation.



- ✓ to create a pool of skilled and highly qualified workforce,
- ✓ to become an accredited training and development facility in industrial automation
- ✓ to increase the manufacturing industry's productivity and raise the country's awareness of Industry 4.0 and its benefits.

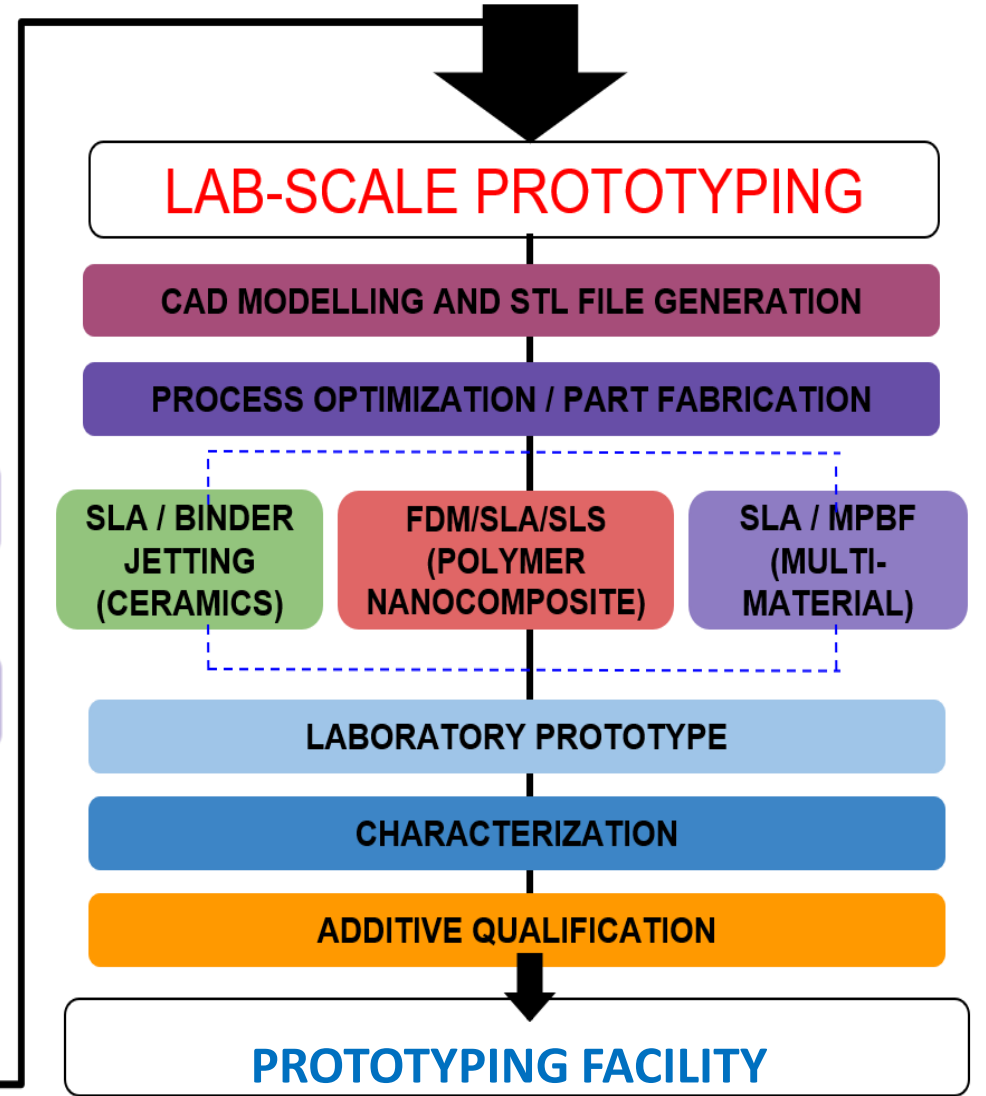


Equipped with advanced laboratory and prototyping three-dimensional (3D) printing technologies for various applications



*Developed Materials at ITDI

**New Blends for R&D



Data Science Curriculum



- **BS Math** minor in Data Science
- BS Data Science AY 2020 - 2021



- **BS Statistics** specialization in Data Analytics



Data Science Program under proposed project Good Governance through Data Science and Decision Support (**GODDESS**)

Data Science Curriculum



MS Data
Science

2018



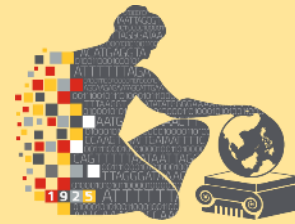
Masters in
Applied
Business
Analytics

2018



MS Data
Science

2019



MS Business
Analytics

2019



Prof. Masters
in Data
Science
(Analytics)



Elective course
"Data Analytics"
Dual programs:

CS & DS

App Phys & DS

IT & DS

Economics & DS