



The Future of R&D Landscape in the Philippines: Research, Development and Commercialization

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Secretary

Department of Science and Technology

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Chap. 14: Vigorously Advancing Science, Technology and Innovation

Challenges on STI:

- WEAK STI culture
- **LOW government spending on STI**
- **INADEQUATE S&T human resources engaged in STI R&D**
- Difficulty in increasing employment opportunities and retaining S&T human capital
- ABSENCE of a vibrant intellectual property culture
- **WEAK linkages among players in the STI ecosystem**
- RESTRICTIVE regulations that hamper the implementation of R&D programs and projects
- **INADEQUATE STI infrastructure**

Technology adoption promoted and accelerated

STI utilization in agriculture, industry and service sectors INCREASED

- ✓ Promote commercialization and utilization of technologies from publicly-funded R&D
- ✓ Develop a vibrant Intellectual Property Rights culture

Investments in STI-based start-ups, enterprises and spin-offs INCREASED

- ✓ Encourage more innovative financing mechanisms and private sector investments
- ✓ Provide support mechanisms for startups and MSMEs in the regions

Innovation stimulated

Creative capacity for knowledge and technology generation, acquisitions and adoptions ENHANCED

- ✓ **Support R&D agenda**
- ✓ **Increase funding for HRD**
- ✓ **Tap foreign and Overseas Filipinos expertise**
- ✓ **Strengthen STI Infrastructure**
- ✓ **Establish and promote innovation hubs and other similar mechanisms**
- ✓ **Foster STI culture**

Open collaboration among actors in the STI ecosystem STRENGTHENED

- ✓ **Strengthen tripartite collaboration**
- ✓ **Intensify international cooperation in STI**

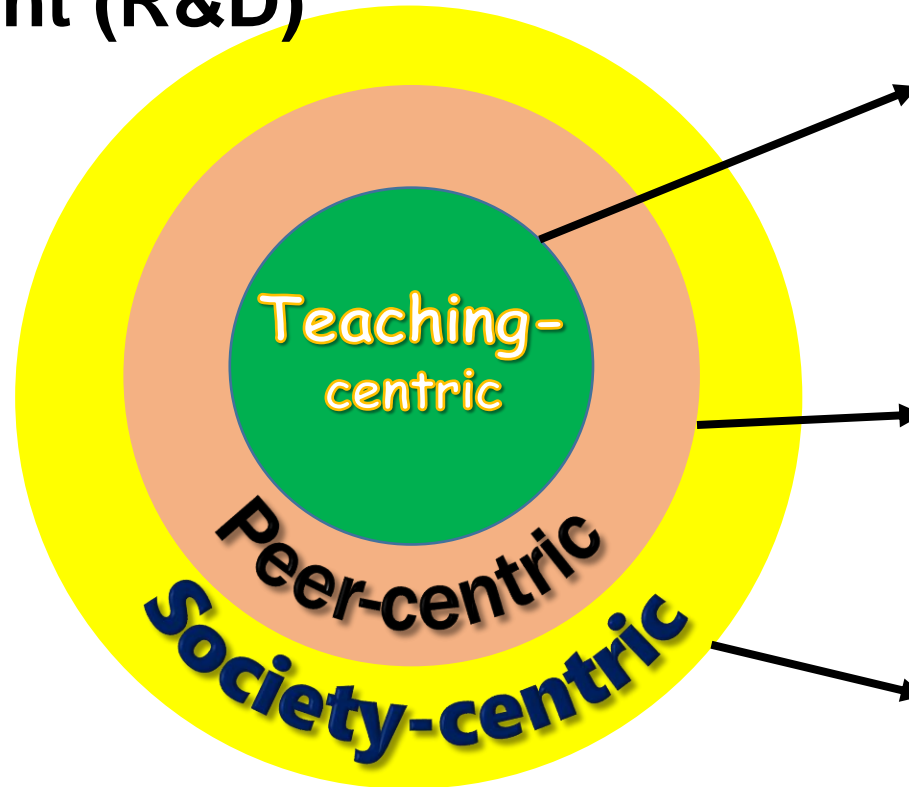
The Role of R&D in nation-building and its Evolution

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**



R&D conducted to improve teaching and capacity building

- University Ranking
- #PhDs/University
- PRC passing rate
- CHED COE/COD

R&D conducted to contribute to the overall scientific knowledge

- Publications
- Patents
- Impact factors
- Citations H-index
- SCS

R&D as a tool for positive societal change

- Impact Assessment
- Economic gains
- Startups

DOST

Source: Dr. Carlos Primo C. David

AmBisyon Natin 2040

Malasakit

Pagbabago

Kaunlaran

Harmonized National R&D Agenda

National Integrated
Basic Research
Agenda (NIBRA)

Health

Agriculture, Aquatic and
Natural Resources
(AANR)

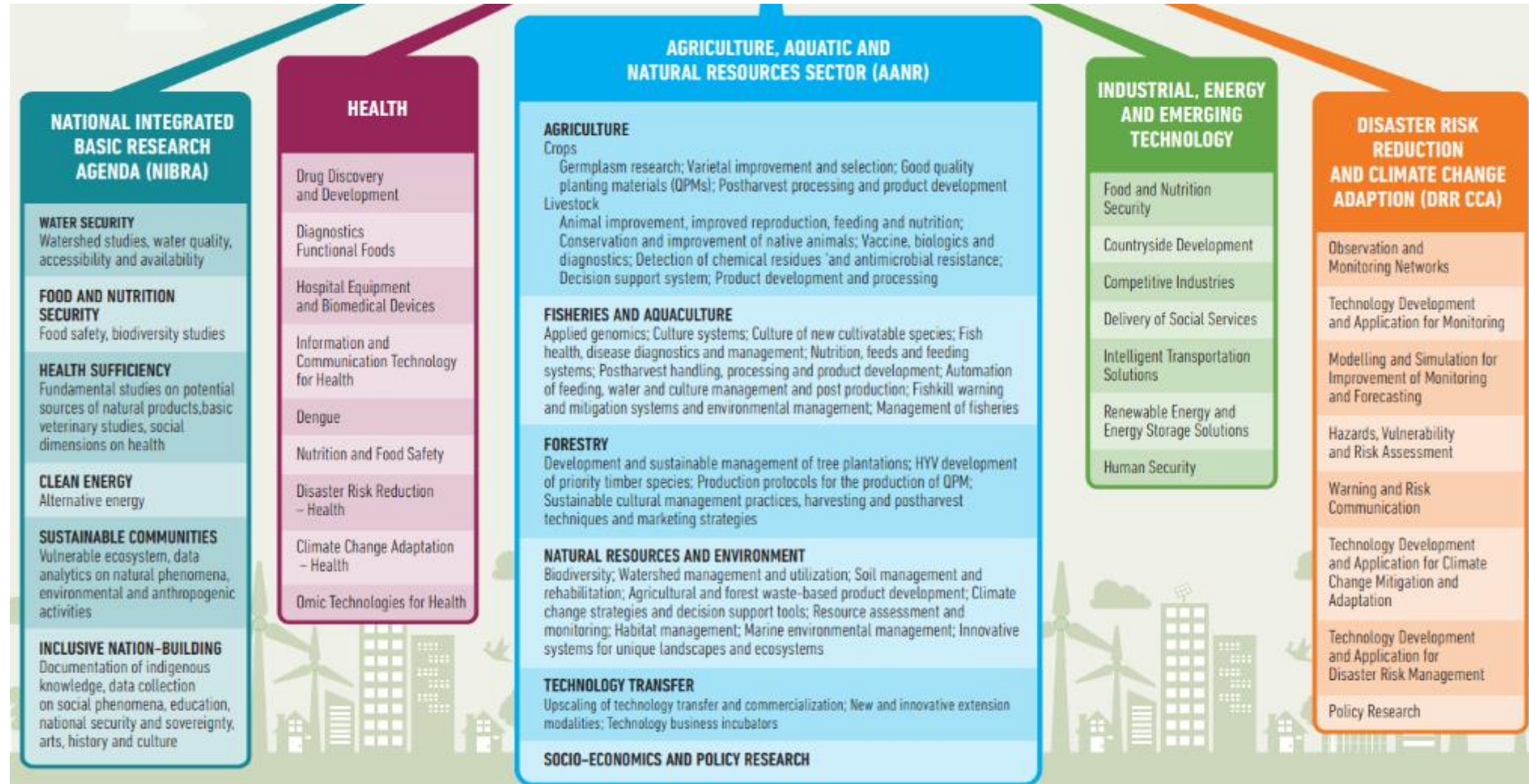
Industry Energy
and Emerging
Technology

Disaster Risk
Reduction and
Climate Change
Adaptation (DRR
CCA)

HARMONIZED NATIONAL R&D AGENDA (2017-2022)

Approved by NEDA dated August 30, 2017

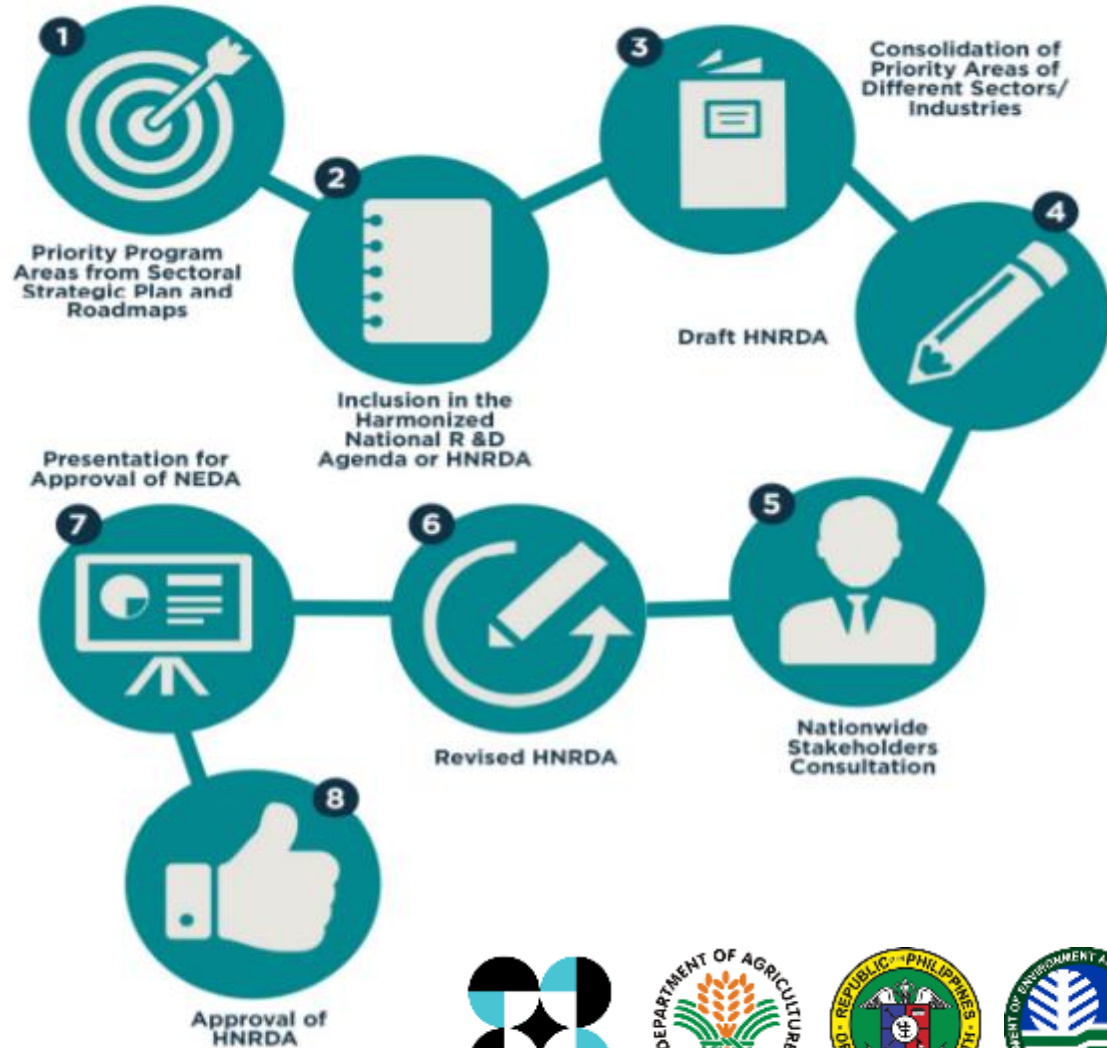
R&D PRIORITY AREAS AND PROGRAMS



Download the HNRDA thru this link:

<http://dost.gov.ph/phocadownload/Downloads/Journals/Approved%20Harmonized%20National%20RD%20Agenda%20%202017-2022.pdf>

Crafting of the HNRDA 2017-2022



DOST-NRCP



DOST-PCAARRD



DOST-PCHRD
ISO 9001:2015

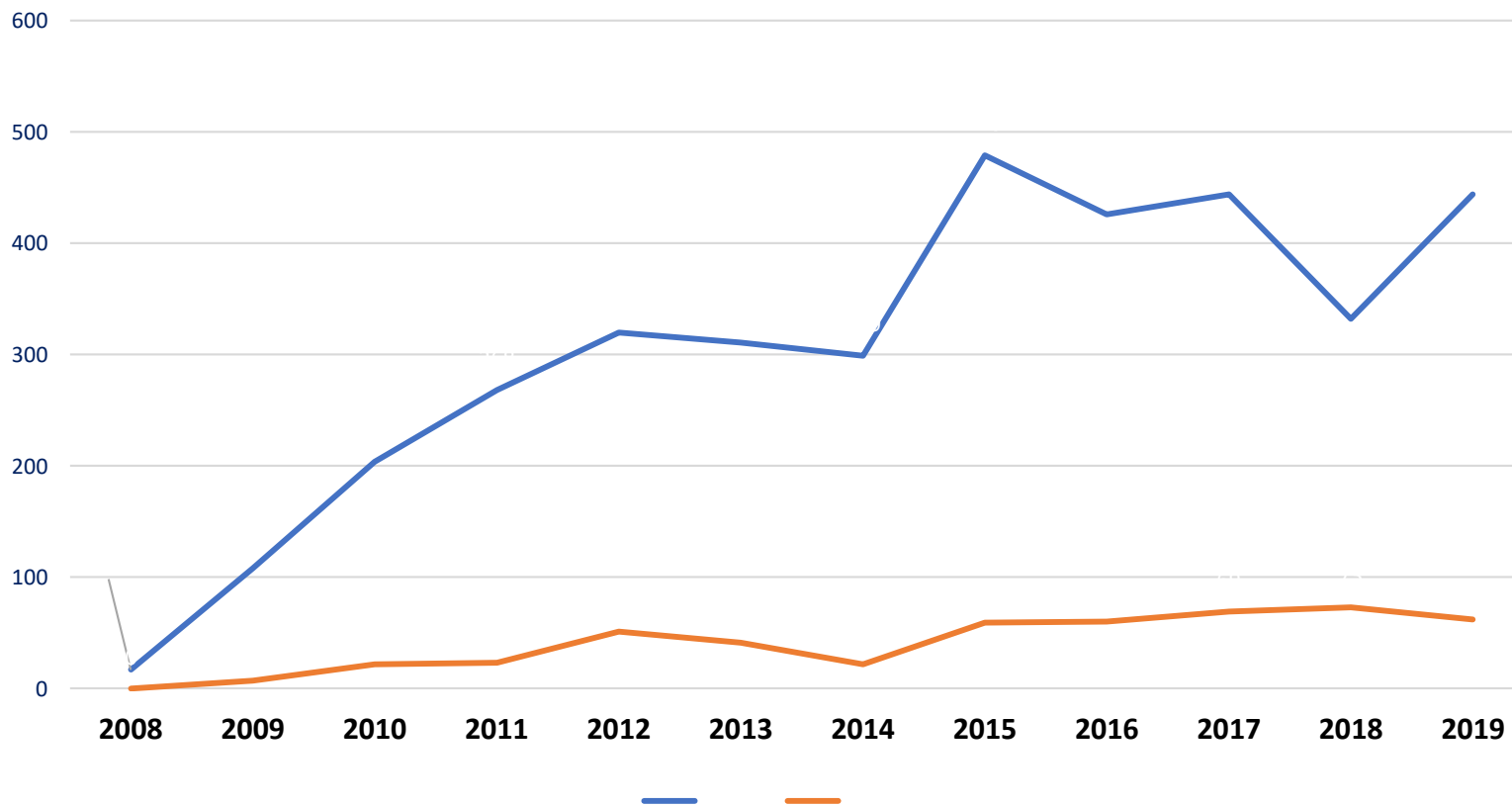


DOST-PCIEERD



S&T Human Resource Development

SCHOLAR-GRADUATES of ERDT & ASTHRDP



Awarded a total of
10,188
MS/PhD
scholarships

4,141
Scholar-graduates

Balik Scientist Program

To **Strengthen** the scientific and technological human resources of the academe, public, and private institutions, including locally registered enterprises in order to **promote** knowledge sharing and **accelerate** the flow of new technologies in the country.



NUMBER OF BALIK SCIENTISTS

10% of the total of Balik Scientists engaged in 2019 after the passing of RA 11035

As of June 2021

577 Balik Scientists

In 16 Regions across the country

126 Host Institutions

Capacitated in Research



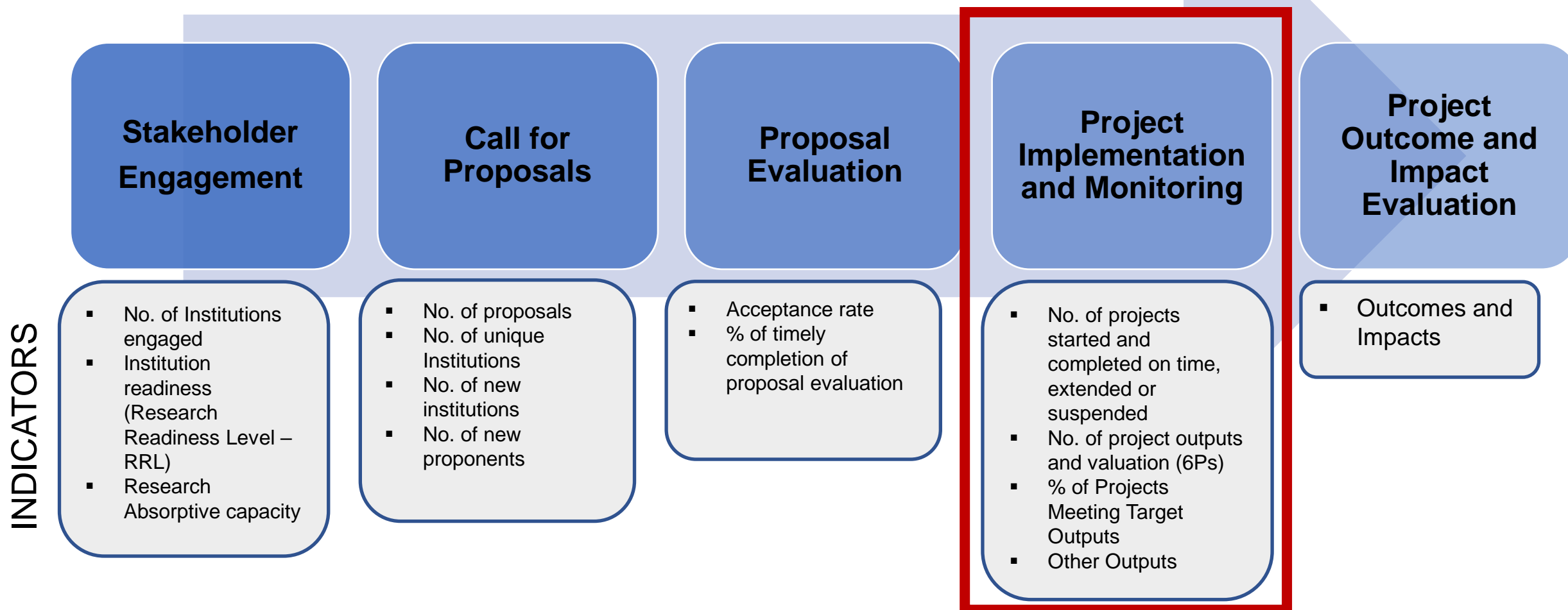
R&D Budget of Government Departments

Based on Unified Accounts Code Structure(UACS) 2016-2021

Department	2016	2017	2018	2019	2020	2021 (NEP)
DOST	5,422,510,000	6,310,249,000	8,185,719,000	6,311,045,000	7,086,628,000	7,380,146,000
DA	2,200,688,000	1,791,572,000	2,359,161,000	2,812,423,000	2,770,316,000	2,733,025,000
DENR	2,231,518,000	635,519,000	778,174,000	761,904,000	457,761,000	701,977,000
Dep Ed	69,000,000	73,784,000	1,526,094,000	1,909,794,000	1,938,493,000	1,786,444,000
DILG	69,314,000	77,881,000	84,317,000	86,680,000	82,546,000	391,974,000
DOF	29,323,000	34,107,000	40,359,000	41,676,000	38,624,000	39,776,000
DOH	58,853,000	75,896,000	215,653,000	134,446,000	129,598,000	255,888,000
DOLE	25,037,000	31,696,000	33,887,000	18,782,000	18,853,000	965,000
DOTC	200,000,000	DOTC has been split into 2 separate departments for transport and communications, RA 10844 approved				
DTI	37,441,000	40,071,000	29,144,000	38,694,000	66,868,000	1,060,000
ARMM	26,221,000	27,791,000	0	27,544,000	0	0
SUCs	2,149,700,000	2,632,001,000	2,049,227,000	2,148,481,000	2,009,300,000	124,932,000
BSGC	653,941,000	693,219,000	482,347,000	992,736,000	1,226,990,000	527,485,000
OTHER EXECUTIVE OFFICES	749,664,000	835,485,000	921,579,000	767,909,000	755,487,000	666,244,000
TOTAL National R&D Budget	14,185,374,000	13,636,395,019	19,869,398,000	20,366,799,000	18,910,207,000	17,150,640,000
Total GAA (National Budget)	2,138,604,596,000	2,499,486,952,000	2,861,527,550,000	2,685,485,754,000	4,100,000,000,000	4,506,000,000,000
Ratio of National R&D Budget against National Budget (GAA)	0.66%	0.5%	0.7%	0.8%	0.5%	0.4%
Ratio of DOST R&D Budget against National Budget (GAA)	0.25%	0.25%	0.29%	0.24%	0.17%	0.17%

Administration of R&D projects

Harmonizing DOST practices for efficient R&D management, inclusive of stakeholder engagement and measurement of impact of programs/projects



DOST-assisted Facilities



The Philippines' national hub for **additive manufacturing/3D printing**



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



Modular Multi-Industry Innovation Center (MMIC)



Food Innovation Centers



Regional Yarn Production and Innovation Center (RYPIC)



Additive Manufacturing Center for Industrial Ceramics (AMCeram)

Simulation Packaging Testing Laboratory (SPTL) and Green Packaging Laboratories (GPL)

RA 10055: The Philippine Technology Transfer Act of 2009



An act providing framework and support system for the ownership, management, and commercialization of the intellectual property (IP) generated from research and development (R&D) funded by the government.



Covers all R&D activities by research and development institute (RDI) for the interest of the Philippine Government, IPs derived from government-funded R&D, government agencies with fund R&D activities, and institutions which implement government-funded R&D.



Serves as an encouragement and an enabling mechanism to STI community to keep up with the rest of the world in terms of innovation and economic progress.

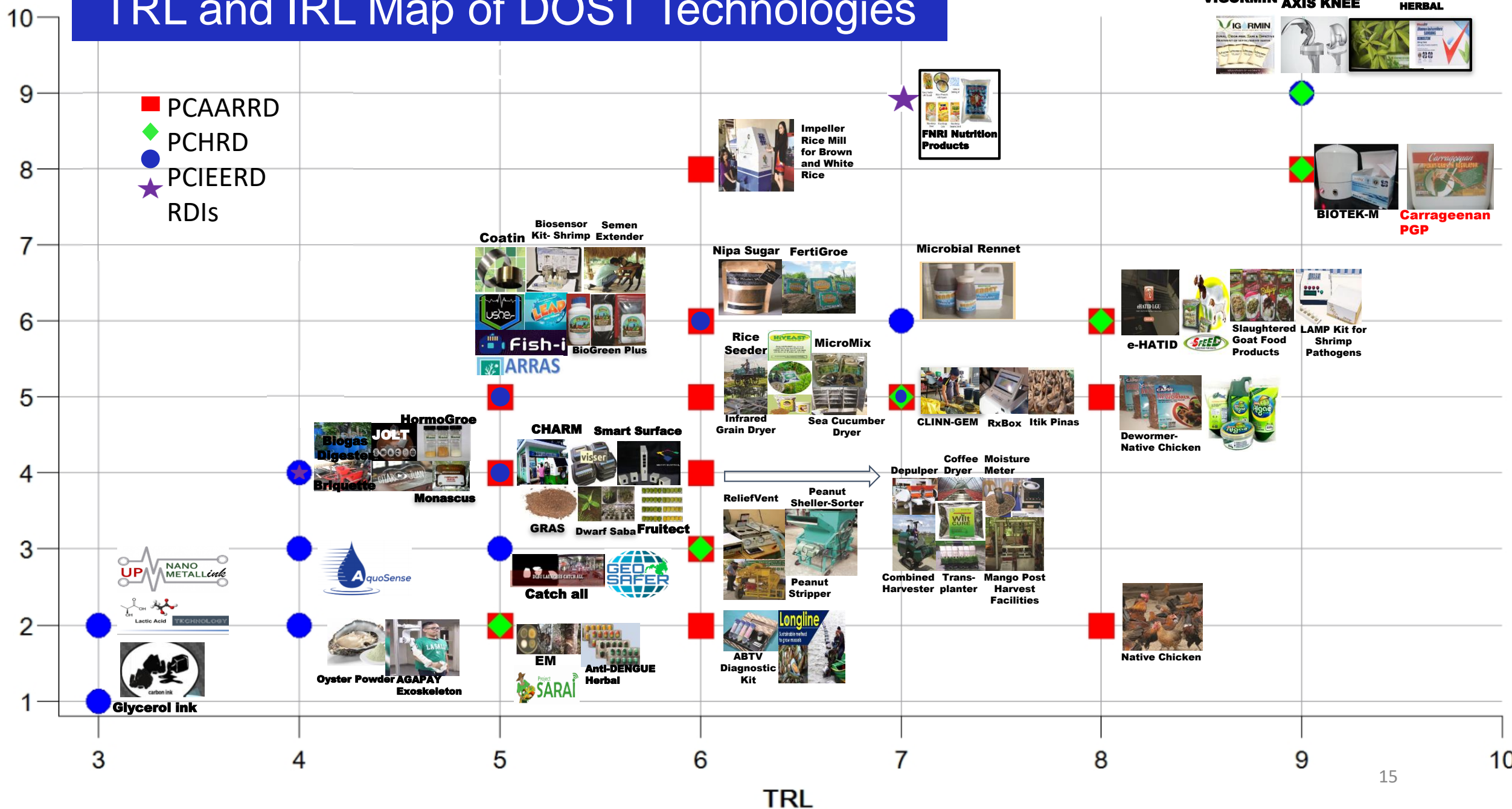
Six (6) DOST IP Policies

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

TRL and IRL Map of DOST Technologies

IRL

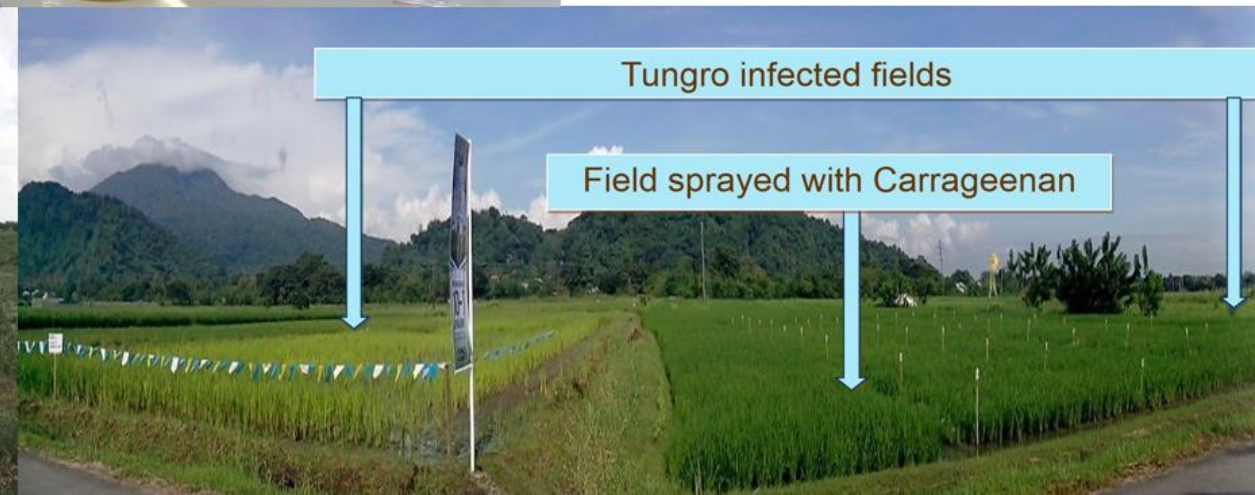
- PCAARRD
- ◆ PCHRD
- PCIEERD
- ★ RDIs



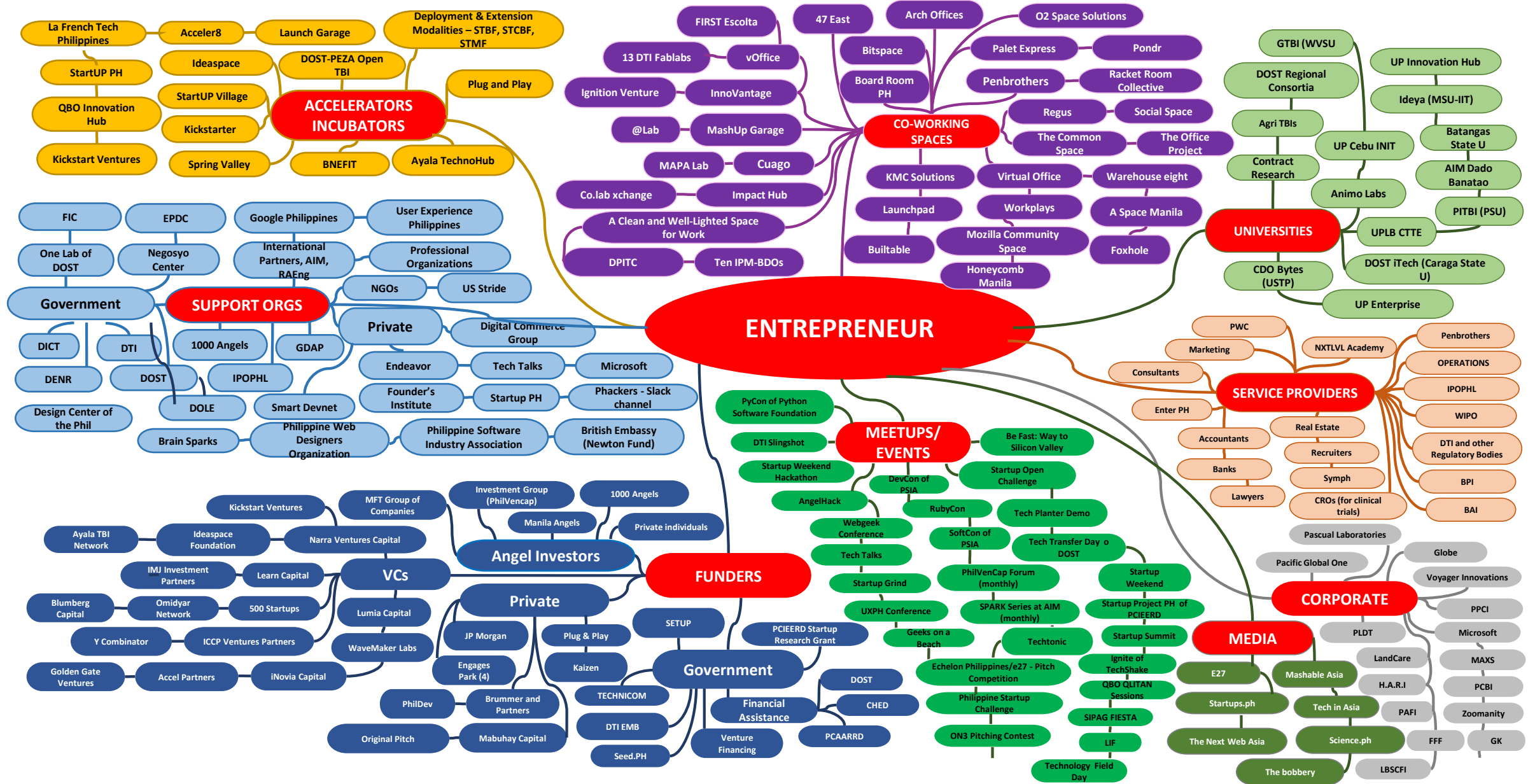
CARRAGEENAN PLANT FOOD SUPPLEMENT

“Carrageenan enhances the crop vigor of rice making rice stronger and resistant to major pests and diseases thus giving farmers higher grain yield”

Effective organic fertilizer
found to increase rice
yield by 20-30% in
Regions 2 and 3



The Philippine Innovation Ecosystem



GenAmplify™ COVID-19 rRT-PCR Detection Kit

Detects the 2019 novel coronavirus (SARS-CoV-2) with **high specificity and efficiency** through a **one-step multiplex real-time polymerase chain reaction (PCR)** platform.

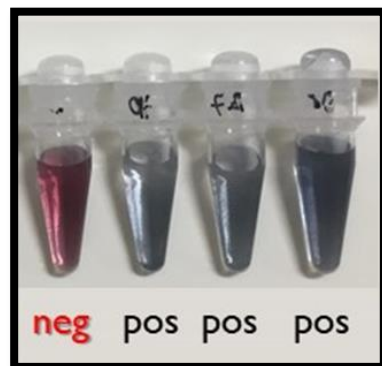


Developed by Dr. Raul Destura of the Manila HealthTek, Inc.



Andali Test Kit for Animal Swine Fever (ASF)

Portable, rapid and sensitive test kit that can detect ASF virus from Fecal Swabs, Oral Swabs, Nasal Swab, Surface swabs and the water supply of the farm

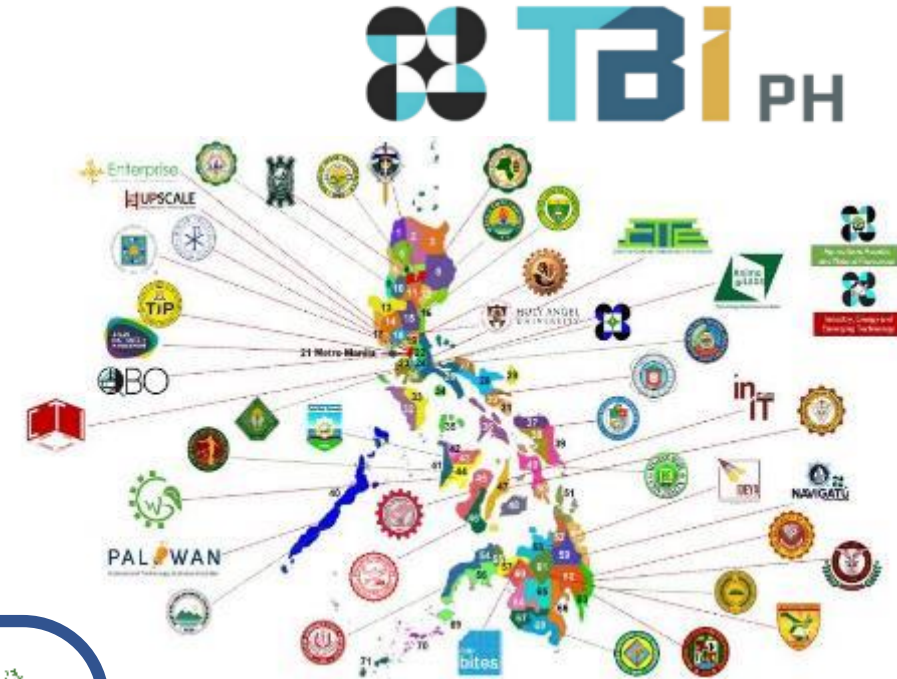


Technology & Innovation Investors – Private and Public

Business Innovation
through S&T for Industry

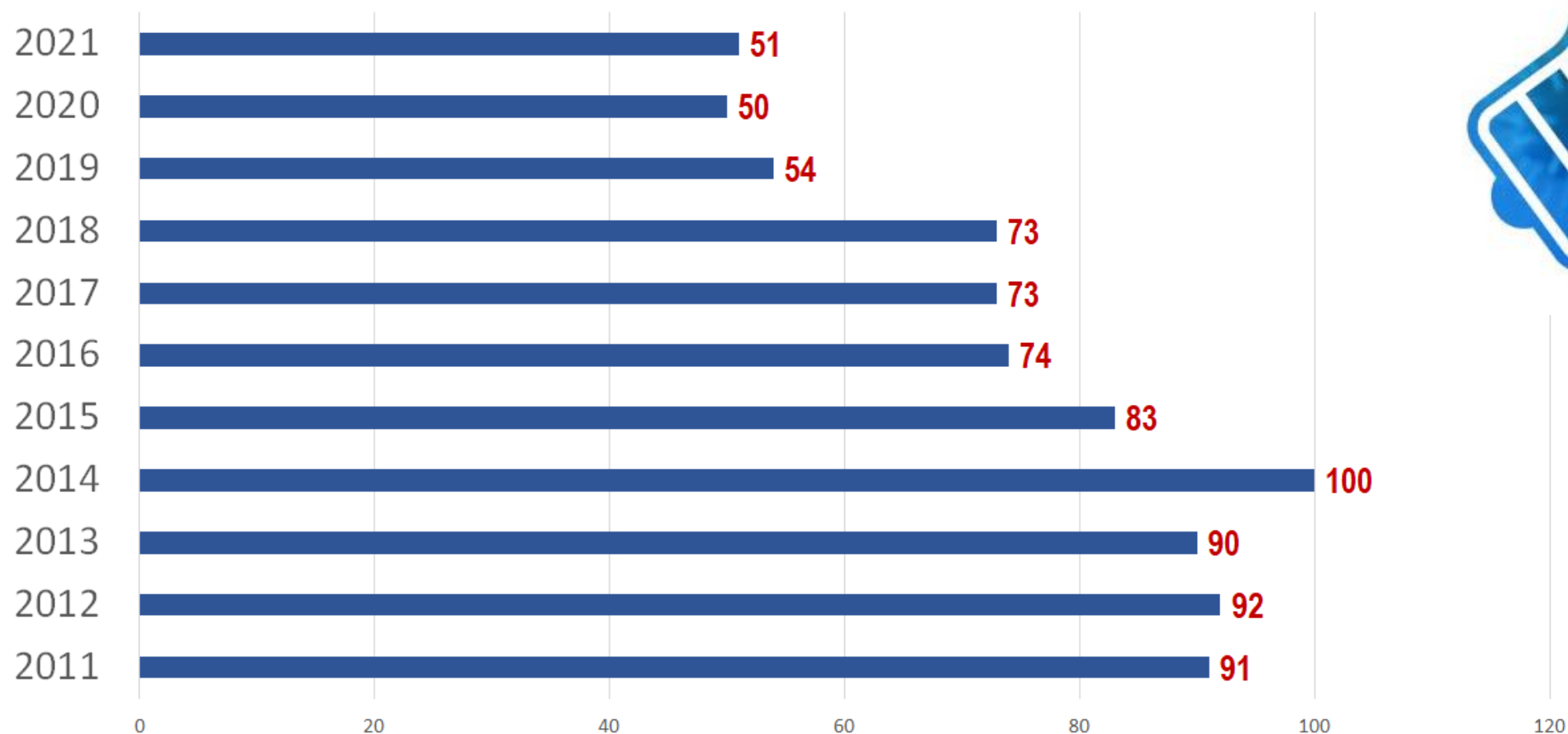


Collaborative R&D to
Leverage Philippine Economy



Innovation Measure

PH Ranking in Global Innovation Index (GII)
2011 to 2021



Innovation Measure

UNCTAD 2021 Reports



Countries overperforming relative to per capita GDP, gain in ranking position

	Country	Overperformance (positions)		Country	Overperformance (positions)
1	India	65	11	Morocco	29
2	Philippines	57	12	Kenya	28
3	Ukraine	47	13	Nepal	28
4	Viet Nam	45	14	Serbia	25
5	China	40	15	Korea, Republic of	24
6	Jordan	34	16	Russian Federation	24
7	Brazil	33	17	Lebanon	24
8	Republic of Moldova	33	18	Togo	23
9	South Africa	29	19	United Kingdom	21
10	Tunisia	29	20	Ghana	20

Source: UNCTAD calculations based on GDP data by the World Bank (World Bank, 2020).

Note: Overperformance by gain in ranking position are measured taking the difference in positions between the actual index rankings and the estimated index rankings based on per capita income. For instance, India's actual index ranking was 43 while the estimated index ranking based on per capita income was 108. Hence, India overperformed by 65 ranking positions.

Innovation Measure



How would you rate the overall performance of the following over the past twelve months?



NAME	NOT AWARE OR DOES NOT KNOW ENOUGH TO RATE	STRONGLY DISAPPROVE	DISAPPROVE	NEITHER	APPROVE	STRONGLY APPROVE	APPROVAL	DISAPPROVAL
AFP	1.267	4.000	7.133	20.400	45.400	21.800	67.200	11.133
TESDA	3.133	2.200	3.267	26.000	45.067	20.333	65.400	5.467
DOST	3.267	1.867	4.133	29.867	45.200	15.667	60.867	6.000
DSWD	1.867	4.667	9.667	28.000	40.933	14.867	55.800	14.334
CHED	2.333	5.933	8.933	28.467	39.867	14.467	54.334	14.866
DOT	1.800	3.267	6.200	35.533	42.400	10.800	53.200	9.467
DPWH	1.533	5.600	10.933	28.867	36.533	16.533	53.066	16.533
DILG	2.000	4.667	9.600	31.600	40.267	11.867	52.134	14.267
DOTR	1.733	5.333	10.000	31.267	39.200	12.467	51.667	15.333
DFA	1.667	4.200	10.600	33.067	39.133	11.333	50.466	14.800
DA	2.800	4.467	10.533	32.133	38.867	11.200	50.067	15.000
SUPREME COURT	2.467	2.667	8.533	36.400	41.067	8.867	49.934	11.200
DENR	2.133	5.067	10.133	32.733	38.067	11.867	49.934	15.200
DTI	2.400	3.667	8.467	35.667	40.067	9.733	49.800	12.134

wellcome^{trust}

Wellcome Global Monitor Trust in Scientists Index

	HIGH TRUST	MEDIUM TRUST	LOW TRUST	NO OPINION
Australia	33%	58%	8%	1%
Czech Republic	33%	43%	16%	8%
New Zealand	32%	61%	5%	2%
Philippines	32%	52%	13%	3%
Iceland	32%	63%	4%	2%
Denmark	31%	62%	7%	0%

16th

Inclusive Innovation: Science for Change Program



Establish R&D Centers in the regions to contribute to regional development.



Create synergistic academe-industry relationship to invigorate Philippine R&D.

**Business Innovation
through S&T for Industry**



Facilitate the acquisition of strategic and relevant technologies by Filipino Companies to support R&D activities.



Engage R&D experts to lead in strengthening the research capabilities of the Higher Education Institutions (HEIs) and Research Development Institutions (RDIs).



As of November 2021

Niche Centers in the Regions for R&D

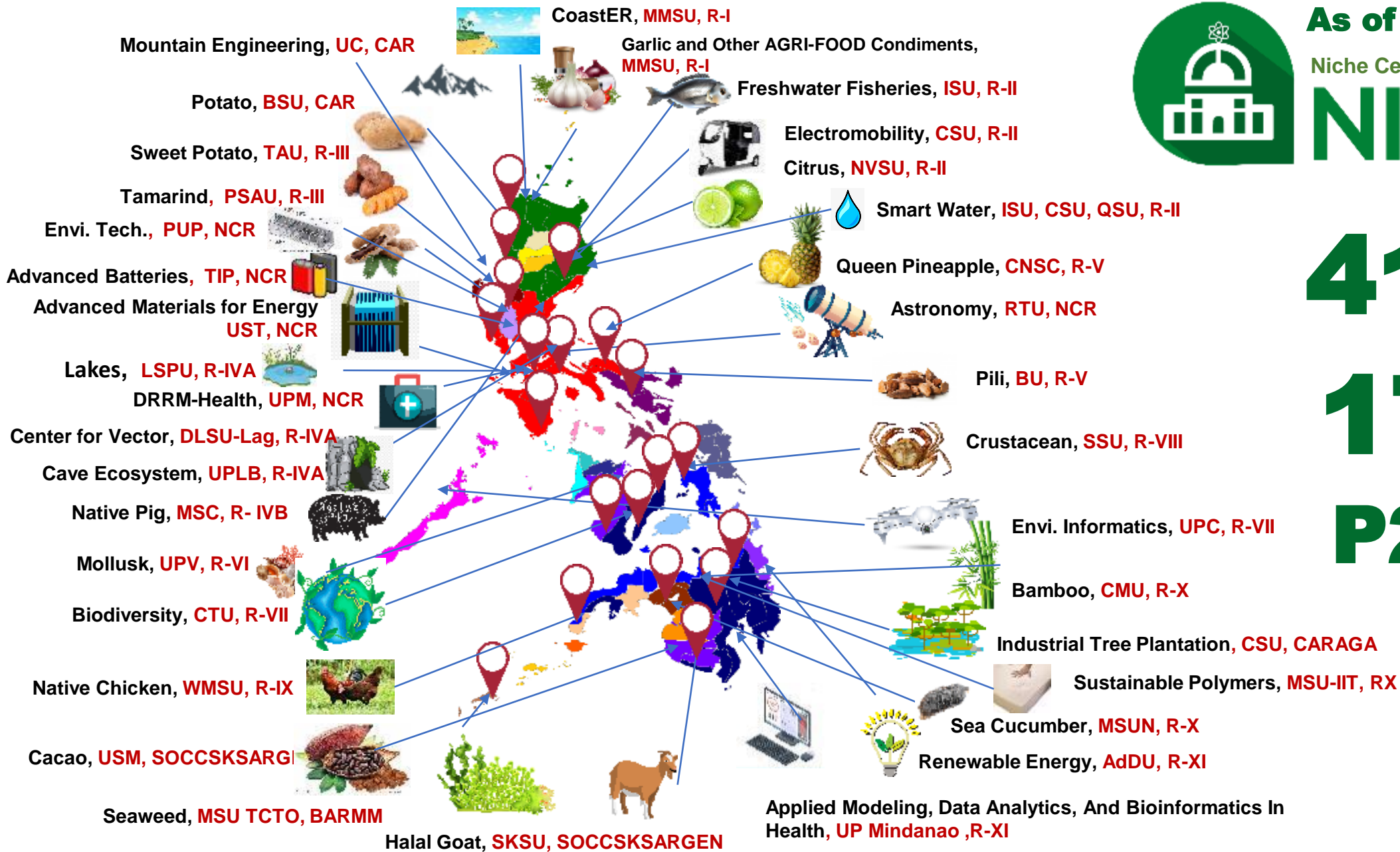
NICER

41 TOTAL
APPROVED
NICERs

17 Regions

P2.17B

**Total Grants
awarded**





RDLEAD

R&D Leadership Program

Engage R&D experts to lead in strengthening
the research capabilities of
HEIs, RDIs, and government agencies

As of November 2021

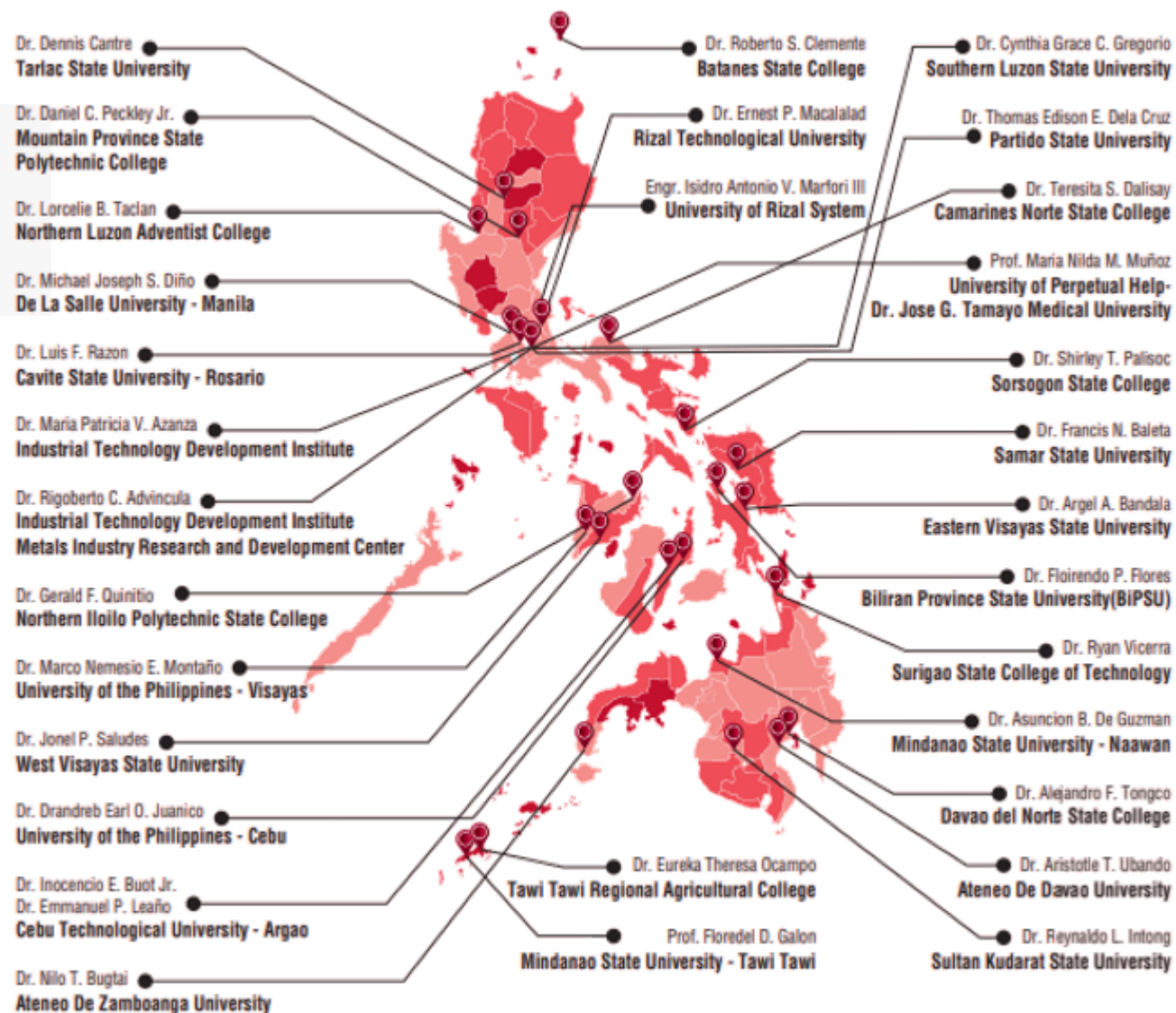
49 RD Leaders

In 17 Regions across the country

P 59.91M Grants awarded

46 Host Institutions

Capacitated in Research



Collaborative R&D to
Leverage Philippine Economy

CRADLE



To create synergistic academe-industry partnerships
to nurture the growth of Filipino companies

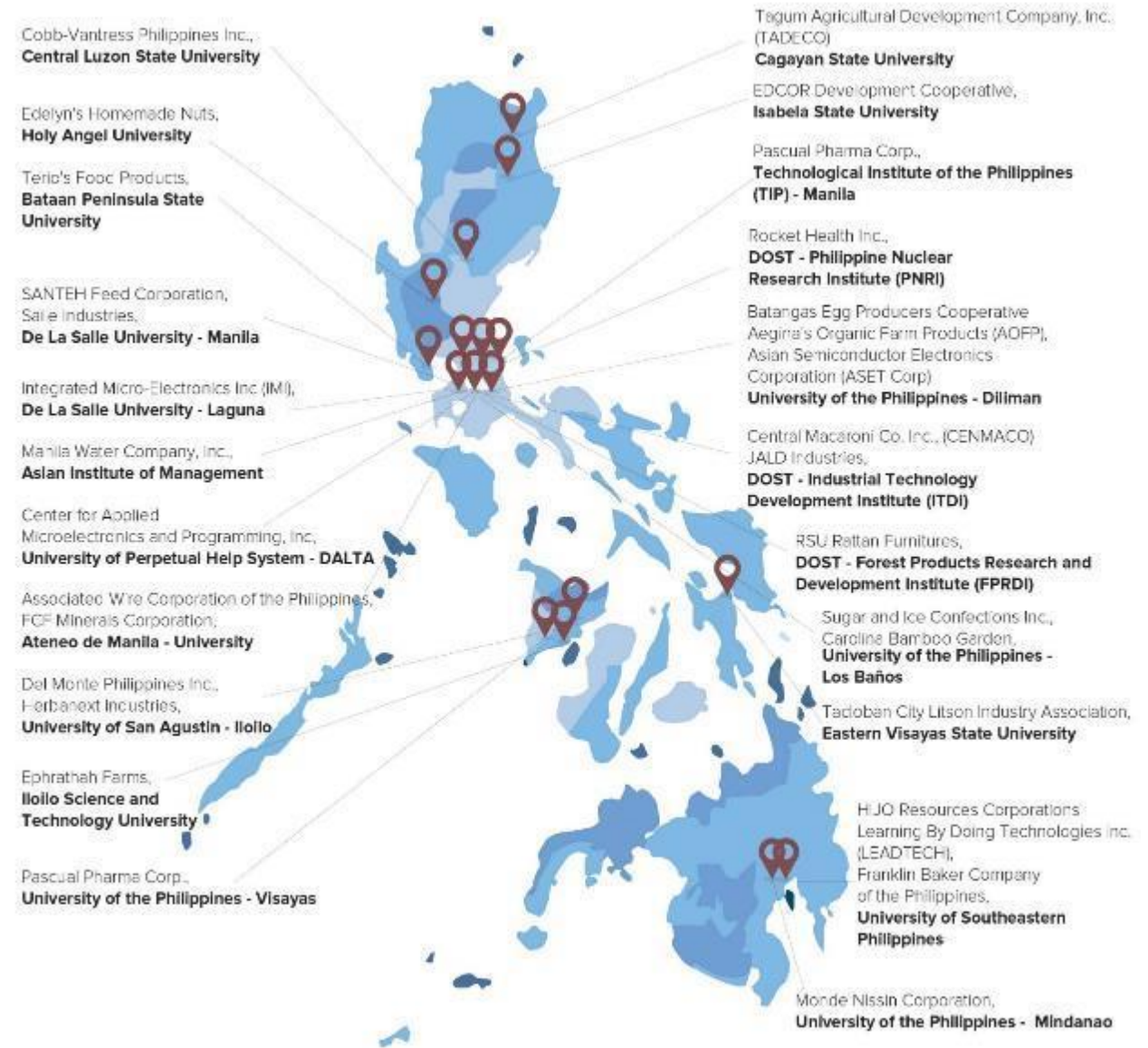
As of November 2021

75 Approved
Projects

10
Regions

P 340 M

Grants awarded to 34 institutions and
76 industry partners



ROSANNA: Banana Disease Surveillance System

Real-time Online Disease Surveillance System

- Black Sigatoka
- Banana Bunchy Top
- Fusarium Wilt
- Moko disease

CRADLE



Business Innovation through S&T for Industry







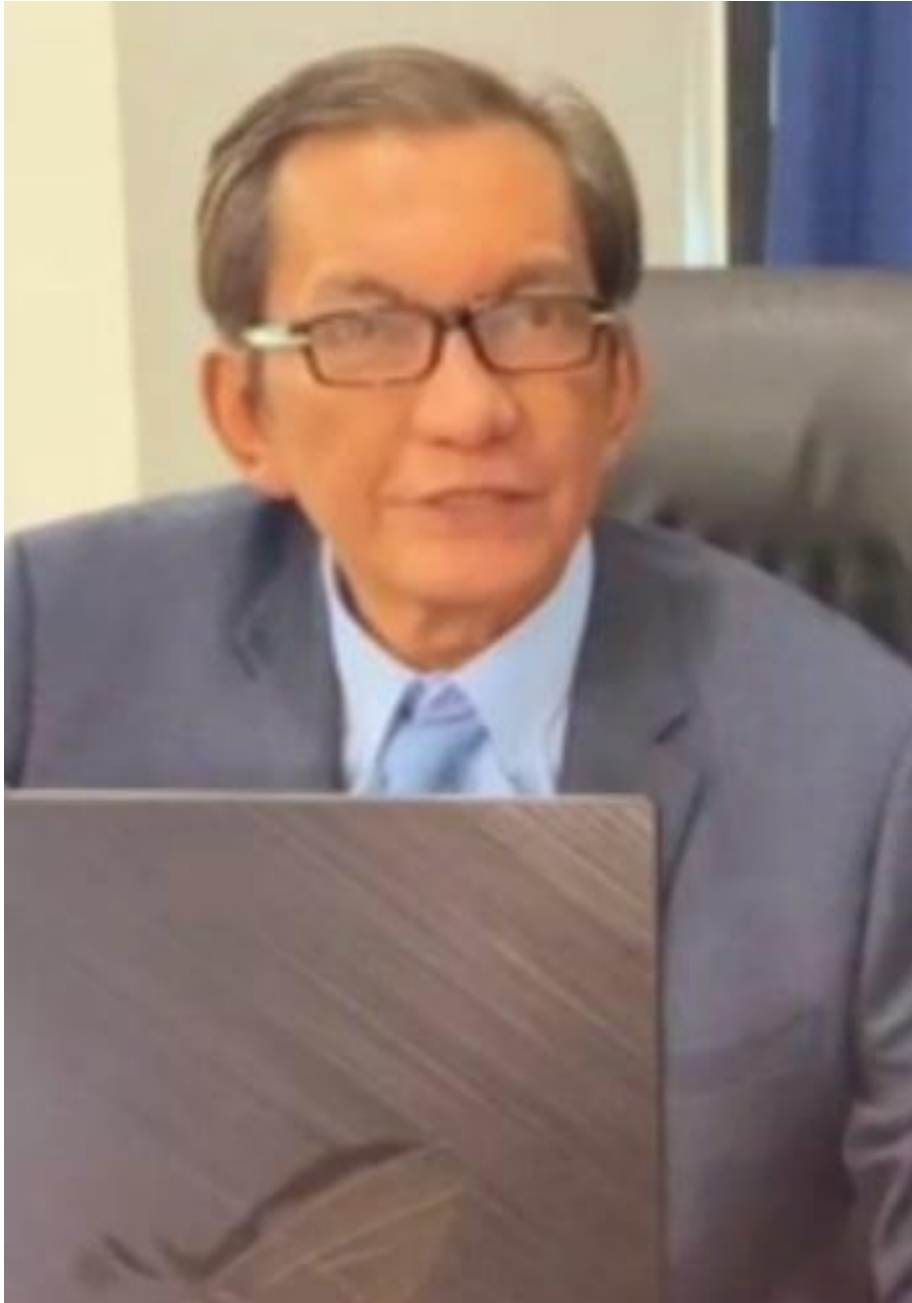
As of November 2021

4 Projects
Approved

43.3M Financial
Assistance

Details of Approved Projects

TITLE	COMPANY	APPROVED BUDGET
Semi-purification of crude plant extracts: an initial step for the production of pharmaceutical grade ingredients		Php 11.7M
BRIDGES: A Brisk Response through In-location Diagnostics and Genome Sequencing		Php 15.9M
Development of a Fully Advanced and Highly Sustainable Packaging Material using Advanced and Nanotech Materials from Indigenous Plants		Php 5M
Development of a Three-dimensional Bioprinted Human Skin Equivalent for In Vitro Biocompatibility Studies of Topical Formulation		Php 10.7M



Legislation of the **Science for Change Bill** (HB 10154)

“ The wealth of nations is now knowledge driven, the solutions to our most life-threatening problems are knowledge-driven. We must invest in R&D not only so that we may grow, but also so that we may survive.

The S4C bill outlines how our R&D investment will help improve every facet of the economy and our society. Our most important national problems: climate change, food security and even the pandemic demand a scientific response. ”

Hon. Joey Sarte Salceda

District Representative

Albay, 2nd District





The Future of R&D Landscape in the Philippines: Research, Development and Commercialization

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