Research, Development and Innovation Linking Government, Academe and Industry

INCLUSIVE INNOVATION CONFERENCE 2018
2-3 October 20187; Sofitel Philippines Plaza Manila

ROWENA CRISTINA L. GUEVARA, Ph.D.
Undersecretary for R&D
Department of Science and Technology
R&D 6Ps

Grants-In-Aid  |  Scholarships  |  TBIs

GOVERNMENT

Economic Contribution  |  Employment

S&T Intervention  |  Start-Up

INDUSTRY

R&D 6Ps

Products (Commercialization)  |  Employment

ACADEME
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*.
Enabling Research, Development and Innovation

• Human Resource Development
• Harmonized National R&D Agenda
• Facilities
• Funding
• Technology Transfer
• Policies and Strategies
S&T SECONDARY LEVEL Scholarship Program

Philippine Science High School (PSHS) CAMPUSES

Complete distribution of PSHS Campuses nationwide in 2016 per RA 9036
R.A. 2067 (MERIT) Scholarships are awarded to poor, talented and deserving students who belong to families whose socio-economic status do not exceed the set values of certain indicators.

R.A. 7687 Scholarships are awarded to students with high aptitude in science and mathematics and willing to pursue fields of science and technology.

R.A. 10612 - The Fast-tracked Science and Technology Scholarship Act of 2013 aims to strengthen the country’s science and technology education by fast tracking graduates in the sciences, mathematics and engineering who shall teach science and mathematics in secondary schools throughout the country.

http://www.sei.dost.gov.ph/
S&T GRADUATE Scholarship Programs

http://www.sei.dost.gov.ph/
Identification of Genetic Variants that predispose to Otitis Media

Introduction of new technologies

- PCAARRD
- PCIEERRD
- PCHRD

Collaboration with International Universities and R&D Institutions

R&D Collaborations

Philippine National Ear Institute and Dr. Regie Lyn Santos-Cortez

Identification of Genetic Variants that predispose to Otitis Media
ASTHRDP and ERDT 2008-2017

105 Disciplines
- ASTHRDP awarded scholarships for 4,335 MS and 889 PhD
- ASTHRDP graduates: 1,982 MS and 258 PhD

26 Disciplines
- ERDT awarded scholarships 2,244 MS and 366 PhD
- ERDT graduates 894 MS and 99 PhD
Global Innovation Index 2017

**STRENGTHS:**
- graduates in science & engineering (#27);
- trade, competition & market scale (27);
- firms offering formal training (9);
- research talent (8);
- high & medium high-tech manufactures (18);
- ICT services exports (16)

**WEAKNESSES:**
- ease of starting a business (#120);
- education (#113);
- expenditure on education (#106);
- government expenditure/pupil (#99);
- pupil-teacher ratio (#99);
- tertiary inbound mobility (#105);
- global R&D Companies (#43)
- scientific & technical articles (#120);
- new businesses/th population (#92);
- creative goods & services (#115);
- online creativity (92)
<table>
<thead>
<tr>
<th>Name of Department</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOST</td>
<td>4,118,058,000</td>
<td>4,372,482,000</td>
<td>5,264,014,000</td>
<td>6,718,440,000</td>
</tr>
<tr>
<td>DA</td>
<td>1,197,085,000</td>
<td>1,918,743,000</td>
<td>2,200,688,000</td>
<td>1,791,572,000</td>
</tr>
<tr>
<td>DENR</td>
<td>971,517,000</td>
<td>513,312,000</td>
<td>2,231,518,000</td>
<td>635,519,000</td>
</tr>
<tr>
<td>DOE</td>
<td>32,635,000</td>
<td>50,463,000</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>DND</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Dep Ed</td>
<td>8,311,000</td>
<td>54,723,000</td>
<td>69,000,000</td>
<td>73,784,000</td>
</tr>
<tr>
<td>DILG</td>
<td>60,682,000</td>
<td>67,819,000</td>
<td>69,314,000</td>
<td>77,881,000</td>
</tr>
<tr>
<td>DOF</td>
<td>26,801,000</td>
<td>28,528,000</td>
<td>29,323,000</td>
<td>34,107,000</td>
</tr>
<tr>
<td>DOH</td>
<td>10,407,000</td>
<td>45,389,000</td>
<td>58,853,000</td>
<td>75,896,000</td>
</tr>
<tr>
<td>DOLE</td>
<td>22,089,000</td>
<td>22,481,000</td>
<td>25,037,000</td>
<td>31,696,000</td>
</tr>
<tr>
<td>DOTC</td>
<td>0</td>
<td>200,000,000</td>
<td>200,000,000</td>
<td>0</td>
</tr>
<tr>
<td>DTI</td>
<td>33,034,000</td>
<td>38,761,000</td>
<td>37,441,000</td>
<td>40,071,000</td>
</tr>
<tr>
<td>ARMM</td>
<td>24,119,000</td>
<td>24,033,000</td>
<td>26,221,000</td>
<td>27,791,000</td>
</tr>
<tr>
<td>SUC's</td>
<td>1,257,498,000</td>
<td>1,507,635,000</td>
<td>2,149,700,000</td>
<td>2,632,001,000</td>
</tr>
<tr>
<td>BSGC**</td>
<td>1,043,712,000</td>
<td>603,935,000</td>
<td>653,941,000</td>
<td>693,219,000</td>
</tr>
<tr>
<td>OTHER EXECUTIVE OFFICES***</td>
<td>1,278,061,000</td>
<td>43,180,000</td>
<td>925,826,000</td>
<td>835,485,000</td>
</tr>
<tr>
<td>TOTAL National R&amp;D Budget</td>
<td>10,084,009,000</td>
<td>9,491,484,000</td>
<td>13,940,876,000</td>
<td>13,667,462,000</td>
</tr>
<tr>
<td>Total GAA (National Budget)</td>
<td>1,608,503,084,000</td>
<td>1,862,824,653,000</td>
<td>2,138,604,596,000</td>
<td>2,499,486,952,000</td>
</tr>
<tr>
<td>Ratio of National R&amp;D Budget against National Budget (GAA)</td>
<td>0.63%</td>
<td>0.51%</td>
<td>0.65%</td>
<td>0.55%</td>
</tr>
</tbody>
</table>
DOST R&D Grant-in-Aid Funding


Millions of Pesos

2009: 1000
2010: 1000
2011: 1000
2012: 2000
2013: 5000
2014: 4000
2015: 4000
2016: 5000
2017: 6000
Evolution of the Role of R&D

Teaching-centric
-R&D conducted to improve teaching and capacity building

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

Peers-centric
-R&D conducted to contribute to the overall scientific knowledge

Publications
Patents
Impact factors
Citations H-index
SCS

Society-centric
-R&D as a tool for positive societal change

Impact Assessment
Economic gains
Startups graduated

Source: Dr. Carlos Primo C. David
Accelerated R&D Program for Capacity Building of Research and Development Institutions and Industrial Competitiveness

**NICER**
Niche Centers in the Regions (NICER) for R&D
Establish R&D Centers in the regions to promote regional development.

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

**CRADLE**
Collaborative Research and Development to Leverage Philippines Economy (CRADLE) Program
Create synergistic academe-industry relationship to invigorate Philippine R&D.

**BIST**
Business Innovation through S&T (BIST) for Industry Program
Facilitate the acquisition of strategic and relevant technologies by Filipino Companies to support R&D activities.
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
Funding Structure

- Maximum funding is Php 5M
- HEI/RDI should have at least 1 partner company
- Partner company will provide 20% counterpart
BIST Program facilitates the acquisition of strategic and relevant technologies by Filipino companies for immediate incorporation in their R&D activities.
BIST  Business Innovation Through S&T for Industry

Funding Structure

- **70%** of the eligible expenses*
- **30%** must be sourced by the applicant

*will be refunded to DOST at **zero percent** interest.
Filipinovation Entrepreneurship Corps

Enabling Researchers to Assess Commercial and Societal Value of their Research
Filipinovation Entrepreneurship Corps

Training Period

3-Day Kick-off Event
- Customer Discovery
  - Online feedback with instructions + office hours

2-Day Final Event
- Customer Discovery
  - Online feedback with instructions + office hours
The FASTRAC is a funding program established to bridge the gap between R&D and commercialization of PCIEERD-funded technologies.
The IMPACT is established to capacitate and assist universities in setting up their technology transfer processes and facilitate commercialization of university-owned technologies.
DOST IPR Assistance Program

http://techtrans.gov.ph/
For Incubating Startups

20 Technology Business Incubators and 2 Innovation Hubs
Financial assistance to startups and technology-based expansion projects to fast track the commercialization of new and innovative technologies and inventions and increase the company’s competitiveness.
✓ Developed by DOST with the aim to create a mechanism to fast track the market-readiness of innovations and technologies developed by the local and supported S&T communities.

- PTRI's Neo-ethnic Philippine Tropical Fabrics (Nationwide Field-Testing and Technology Validation of Natural Fiber Blended Yarns and Eco-friendly Treatment and Dyeing Technologies)
- UPM's BIOTEK-M Aqua Kit (Liquid Format) (Prototype Development, Field Testing)
- FNRI Iron Fortified Rice (Scaling-Up Rice Fortification Program: Techno-Transfer to Private Mills)
- Botanical Dewormer for Free Range Native Chickens, CSU-Dumarao
Level up Industries:
Small Enterprise Technology Upgrading Program

SETUP Priority Sectors

Food Processing
Metals & Engineering
Agriculture / Marine / Aquaculture
Others: ICT and Health Products
Gifts, Decors and Handicraft (GDH)

Level up Industries:
Small Enterprise Technology Upgrading Program

National Capital Region
179
310
95
72

179 Ilocos Region
60
72
Cagayan Valley
179

68
Calabarzon
Central Luzon
68

60
Bicol Region
Western Visayas
72

49 Mimaropa
146 Eastern Visayas

430 Central Visayas
Northern Mindanao

155 Autonomous Region
Mindanao

95 Zamboanga Peninsula
310 Davao Region

211 Caraga
215 Soccsksargen

737
OneSTore provides customers with an effortless shopping experience and retailers with simple and direct access to one of the largest customer base system in the Philippines.

For MSMEs to access local and global markets

http://onestore.ph/
1. Biofertilizers and Plant Growth Enhancer

Irradiated CARAGEENAN
Plant Growth Promoter

FERTIGROE controlled/slow
release fertilizer for corn and sugarcane

RICE YIELD
INCREASE
15-40%

MONGGO YIELD
INCREASE
33%

145% increase in yield
50% fertilizer cost reduction
32% increase in nutrient uptake

Image source:
http://blog.growingwithscience.com/2012/02/seed-of-the-week-popcorn-science/
2. Native Livestock Purelines Technology

**Philippine Native Pigs**
- LAMP-based test kit
- Gene marker technology

**ITIK PINAS**
- Itim ITIK PINAS pureline
- Khaki ITIK PINAS pureline

**Philippine Native Chicken**
- IP-Kayumanggi is developed for balut and salted egg production.
- Benefitted duck breeders by saving time and labor cost of vent-sexing of day-old ducklings.
3. Diagnostic Kit: BIOTEK-M Aqua Kit

- Affordable rapid test kit for accurate detection of dengue infection within an hour
- Has high sensitivity, high specificity, robust, and is less expensive than current diagnostic tests in the market

100% Filipino designed and locally-developed technology

Gold Awardee during the 46th International Exhibition of Inventions Geneva held on 11-15 April 2018 at Palexo, Geneva


A total knee replacement system that is specifically designed for the Asian population

This world-class, FDA-approved product was conceptualized and developed by Filipino doctors and engineers, together with some consultants from Japan, China, and US, and is being manufactured locally in Orthopaedic International Inc’s ISO 13485-certified plant in Cabuyao, Laguna.

Its patent-pending instrumentation and surgical technique allows the surgeon to perform the procedure accurately without the use of x-ray, thus eliminating the possibility of implant failure.

✓ Very affordable, as it costs 50% less than other knee implants in the market

4. Medical Implant: Axis KNEE SYSTEM

A total knee replacement system that is specifically designed for the Asian population

This world-class, FDA-approved product was conceptualized and developed by Filipino doctors and engineers, together with some consultants from Japan, China, and US, and is being manufactured locally in Orthopaedic International Inc’s ISO 13485-certified plant in Cabuyao, Laguna.

Its patent-pending instrumentation and surgical technique allows the surgeon to perform the procedure accurately without the use of x-ray, thus eliminating the possibility of implant failure.

✓ Very affordable, as it costs 50% less than other knee implants in the market
5. Water Treatment Materials

VIGORMIN - organo minerals for treating wastewater and neutralizing odor from organic waste in landfill or material recovery facilities.
6. Sustainable Mass Transport
Innovation Drivers in the Investment Priority Plan 2017-2019

- Research and development activities
- Clinical trials (including drug trials)
- Centers of Excellence (e.g., academic and medical facilities)
- Innovation centers
- Business incubation hubs
- Fablabs/co-working spaces
- Shared Service Facility for MSMEs
- Commercialization of new and emerging technologies and products of DOST or government-funded R&D
Research, Development and Innovation Linking Government, Academe and Industry

INCLUSIVE INNOVATION CONFERENCE 2018
2-3 October 2018; Sofitel Philippines Plaza Manila

ROWENA CRISTINA L. GUEVARA, Ph.D.
Undersecretary for R&D
Department of Science and Technology