



Department of Science and Technology

Financing Mechanism for Translating Research in the Public Sector

AASSA-NAST PHL International Symposium

“Realizing the Full Scale of Research and Development: From Bench to the Community”

21 September 2017; Tagaytay City

ROWENA CRISTINA L. GUEVARA, Ph.D.

Undersecretary for Research and Development

Outline

- STI Ecosystem
- Enabling Technology Transfer
- Mechanisms for Translating Research
- Some Examples of Translated Research

Elements of an STI Ecosystem

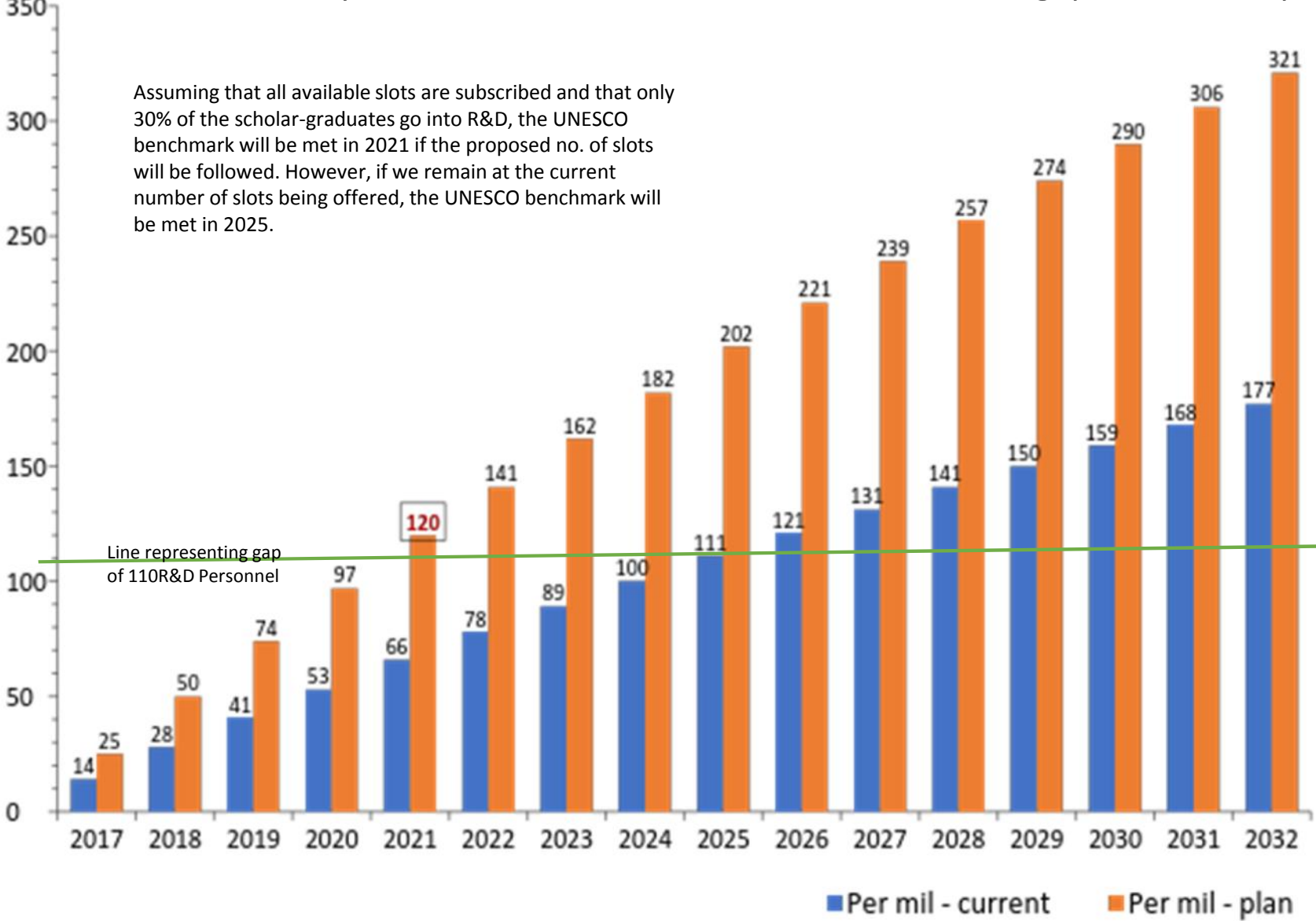
S&T HRD
R&D

Tech Transfer
S&T Services

STI ECOSYSTEM

C. S&T Human Development

Comparison in the number of years needed to meet UNESCO benchmark gap current vs. proposed



Assuming that all available slots are subscribed and that only 30% of the scholar-graduates go into R&D, the UNESCO benchmark will be met in 2021 if the proposed no. of slots will be followed. However, if we remain at the current number of slots being offered, the UNESCO benchmark will be met in 2025.

Line representing gap of 110 R&D Personnel

2018	P5 B
2019	P7.3 B
2020	P10.9 B
2021	P16.2 B
2022	P24.3 B



NOTE: Slots (30% of the figures in the previous slide) were converted to per million population for easier comparison with UNESCO figure

DOST Grants-In-Aid (GIA) Program

The **DOST-GIA** aims to harness the country's scientific and technological capabilities by providing financial grants to S&T programs/projects to spur a sustainable economic growth for the country.

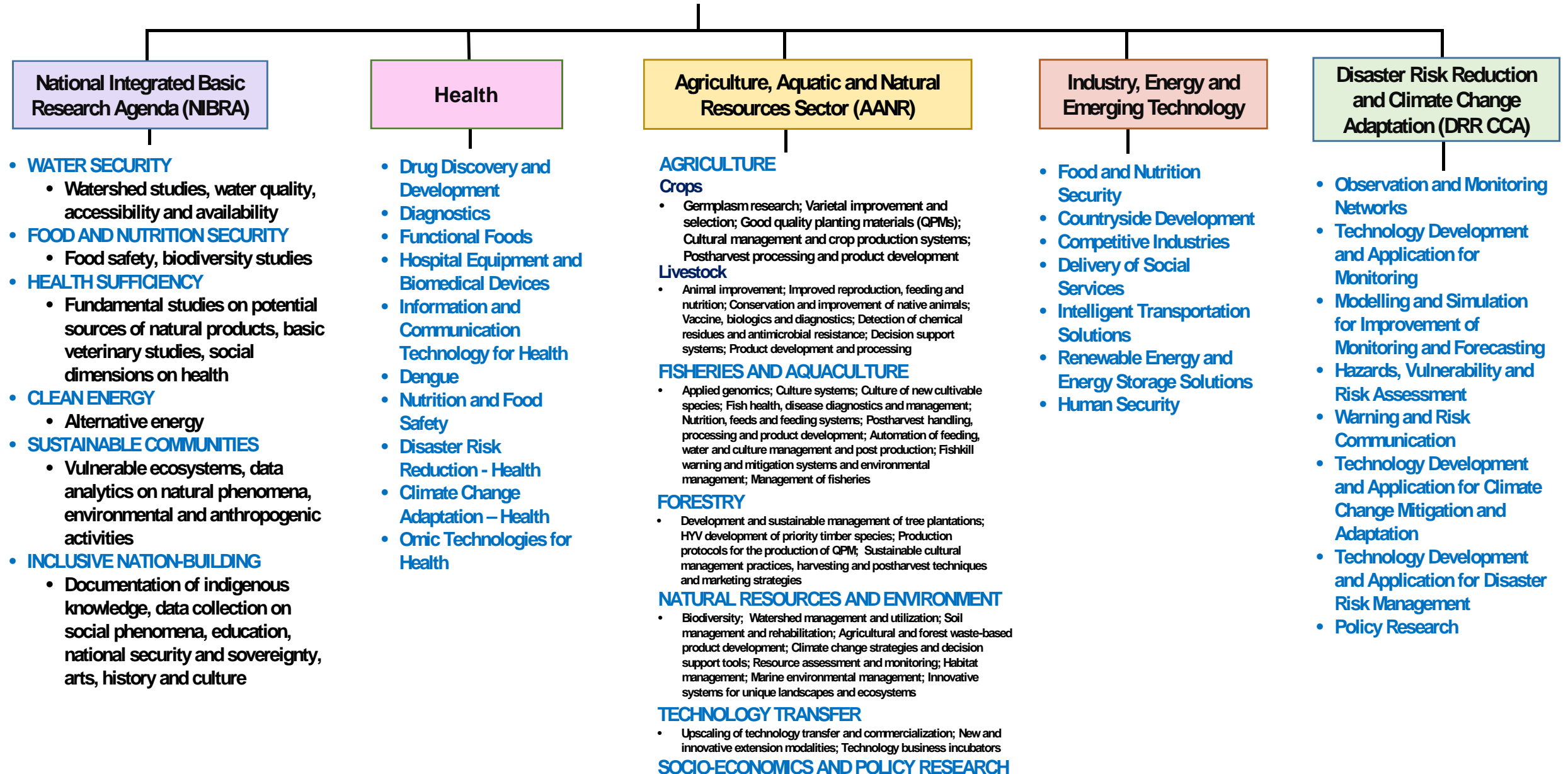
Funding Assistance Coverage:

- **Generation of Knowledge and Technologies**
 - Fundamental/Basic R&D
 - Applied Research
 - Experimental Development
 - Pilot Testing
- **Diffusion of Knowledge and Technologies**
 - Technology Transfer
 - Technology Receptor Capability Building
 - Innovation Capacity Building
- **Development of S&T Human Resources**
- **Provision of Quality S&T Services**



HARMONIZED NATIONAL R&D AGENDA (2017-2022)

R&D Priority Areas and Programs



6Ps Metrics: Evaluation of R&D Proposals

Publications

Patents

Products

People Services

Places and Partnerships

Policies



Technology Transfer Act of 2009 (RA 10055)



- **Ownership**
- **Management**
- **Use and Commercialization**



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<https://thumb7.shutterstock.com>, <https://us.123rf.com>

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- STI Ecosystem
- **Enabling Technology Transfer**
- Mechanisms for Translating Research
- Some Examples of Translated Research

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

DOST IP Policies (6)

1) Intellectual Property Policy

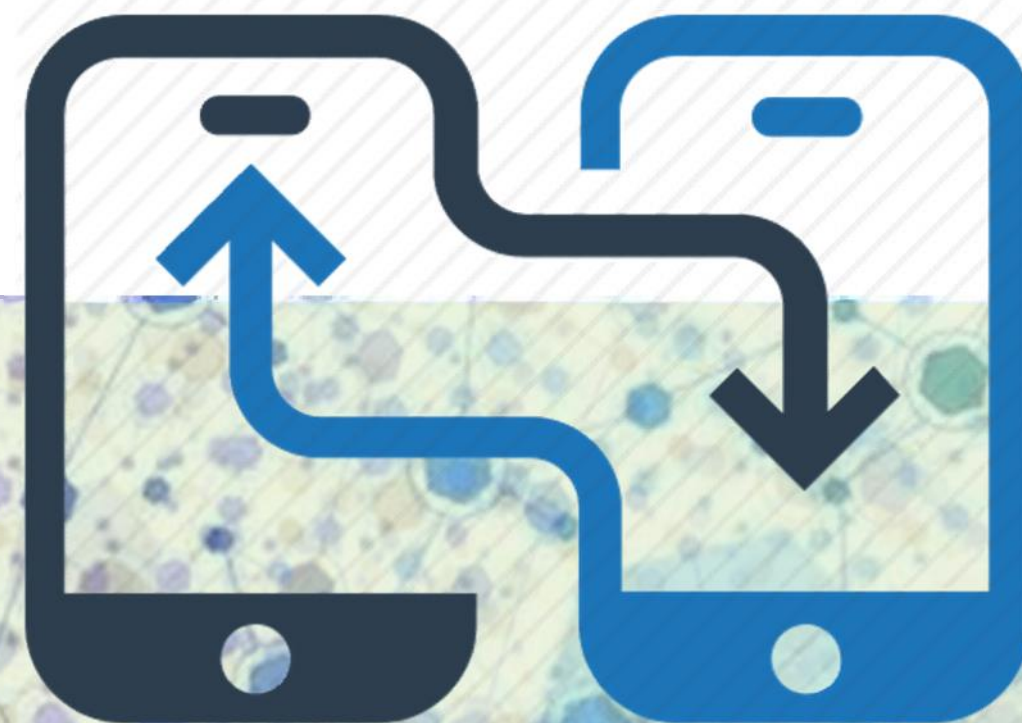
Administrative Order No. 004, Series of 2015, 13 April 2015



DOST IP Policies (6)

2) Data Sharing Policy

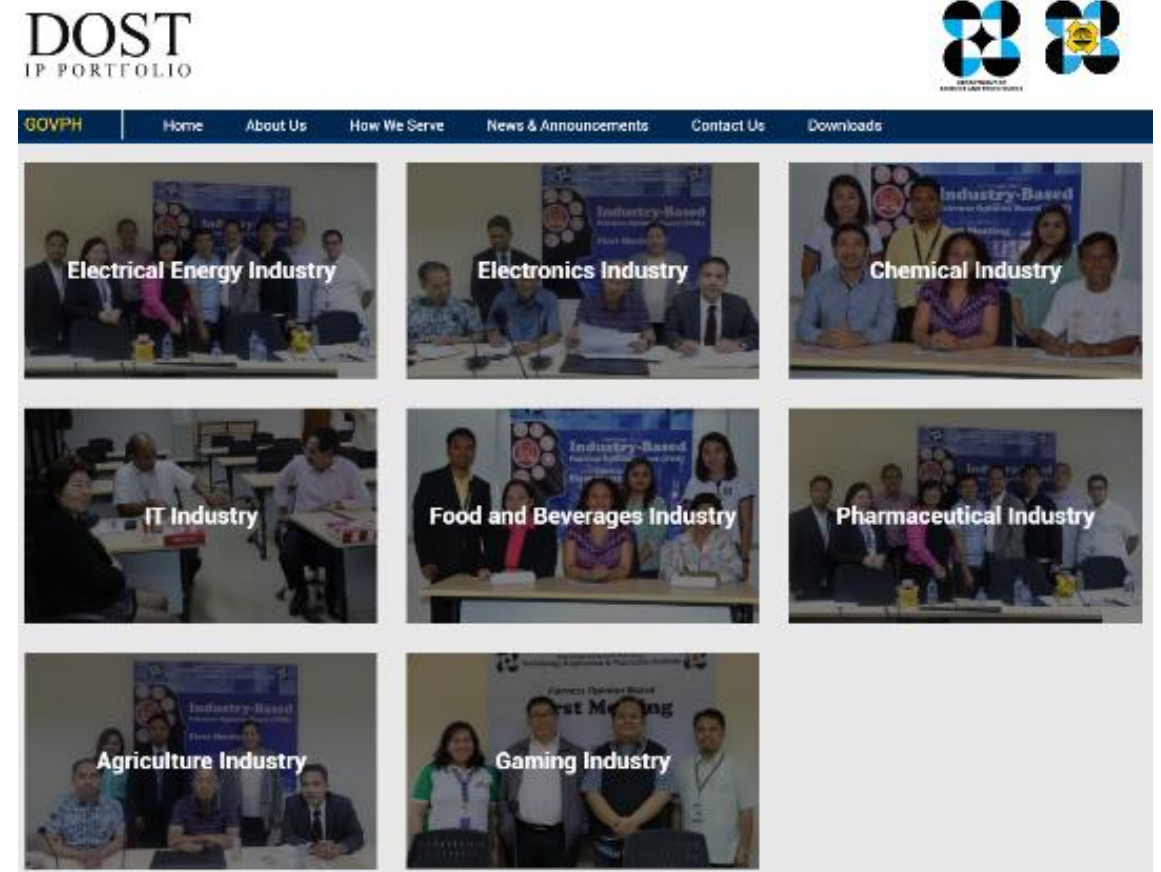
Administrative Order No. 003, Series of 2015, 08 Apr 2015



DOST IP Policies (6)

3) The Fairness Opinion Board (FOB) and the Issuance of Fairness Opinion Report (FOR)

Memorandum Circular No. 003
Series of 2015, 15 Sept 2015



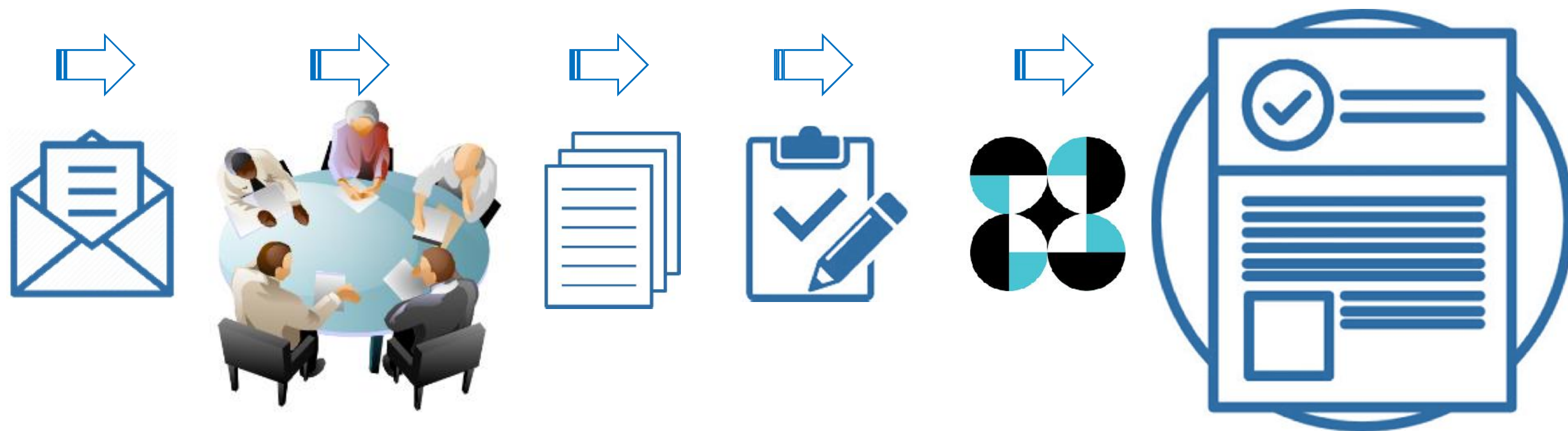
✓ 8 - *Industry-Based FOBs constituted*



DOST IP Policies (6)

4) Technology Transfer Protocol - RDIs

Administrative Order No. 009, Series of 2015, 14 Sept 2015



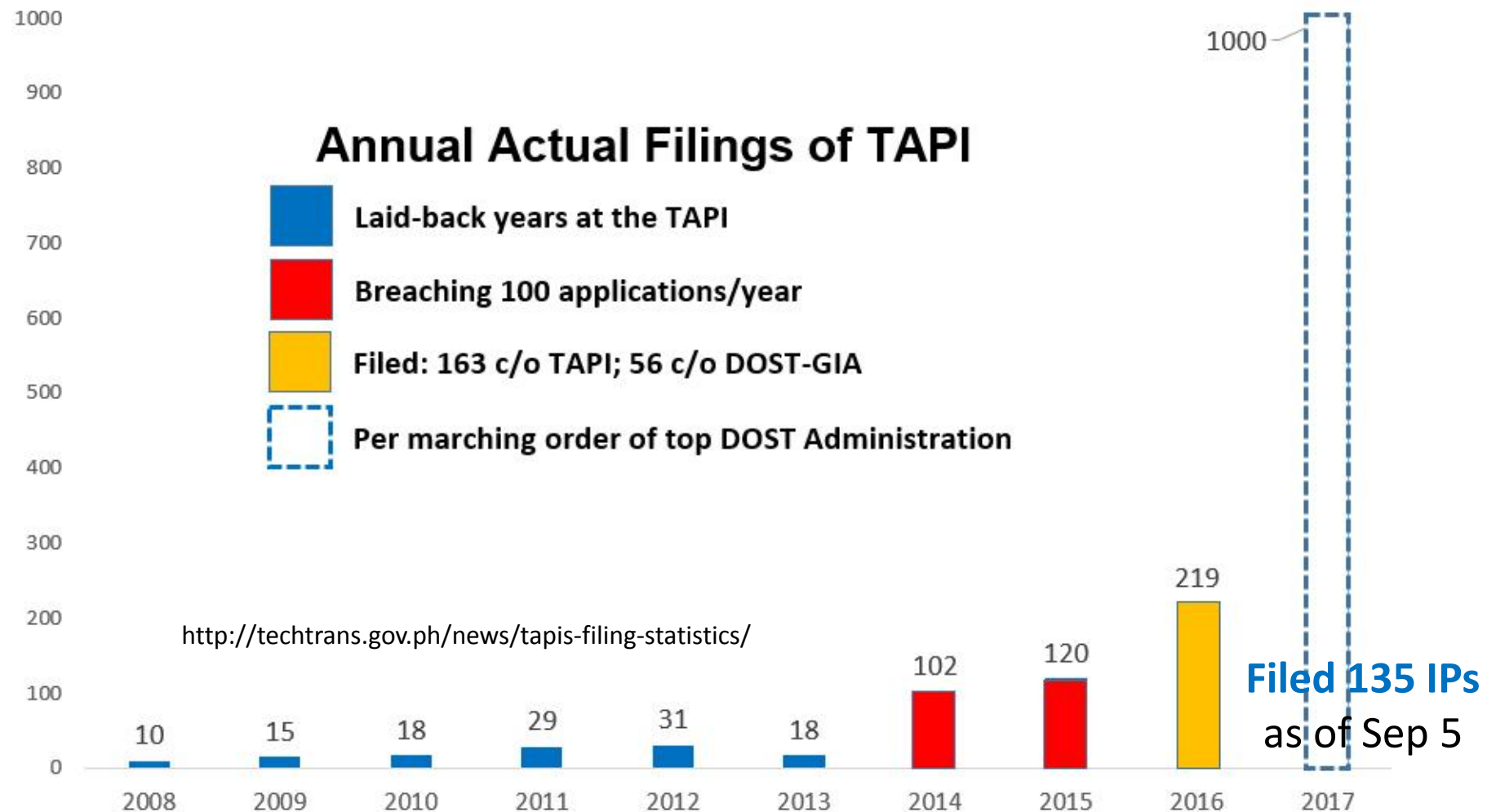
DOST IP Policies (6)

5) IP Management Protocol

Administrative Order No. 004, Series of 2016, 01 Feb 2016



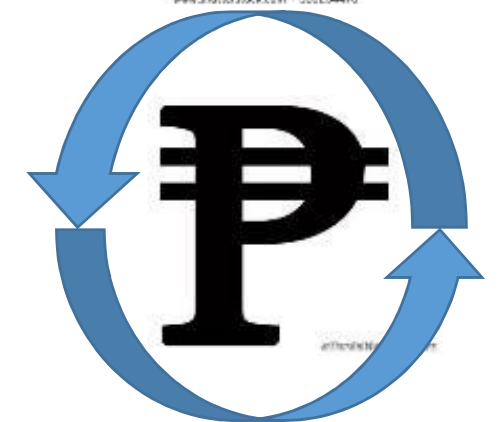
techtrans.gov.ph



DOST IP Policies (6)

6) Guidelines and Procedures in the Establishment and Maintenance of Revolving Funds of RDIs within DOST

Memorandum Circular No. 001, Series of 2015, 05 Mar 2015



Clipart source: <https://www.shutterstock.com/image-illustration/revenue-sharing-stamp-sign-text-word-516254476>
https://www.google.com.ph/search?biw=1920&bih=925&tbm=isch&sa=1&q=peso+sign&oq=peso+sign&gs_l=psy-ab.3..0l2j0i67k1j0.136210.137328.0.137605.9.9.0.0.0.88.610.8.8.0...0...1.1.64.psy-ab..1.8.606.37i5dpO-Rdo#imgrc=_Rqk9bTBjmLKTM:

Seminars/Workshops Conducted on Technology Transfer



TECHNOLOGY COMMERCIALIZATION
22 April 2016



TECHNOLOGY TRANSFER PROCEDURE
FOR RESEARCHERS
25 July 2016



Conducted by the Technology Licensing Office (TLO) Program

Seminars/Workshops Conducted on Technology Transfer

TECHNOLOGY TRANSFER LAW AND DOST IP POLICIES FOR RESEARCHERS



Philippine Rootcrops Training Hall, Visayas State University, Baybay Leyte, 15 September 2016



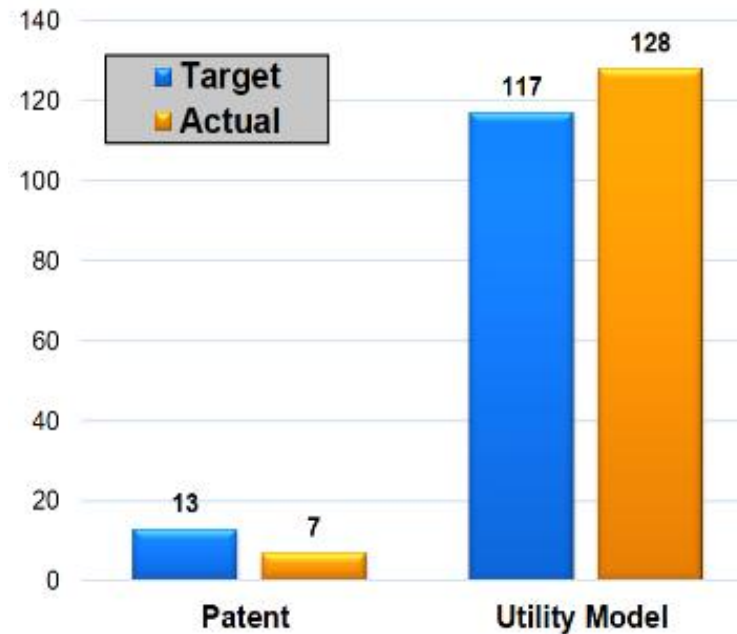
Elena Diola Hall, DOST Region VII Complex, Sudlon, Lahug, Cebu City, 19 June 2017

Conducted by the Technology Licensing Office (TLO) Program



IPR Assistance Program

Technology Application and Promotion Institute (TAPI)



Technology Owner	Total
ITDI	27
STII	8
MIRDC	6
PTRI	13
FNRI	9
NRCP	6
PNRI	6
Tarlac Agricultural University	8
Visayas State University	13
University of Southern Mindanao	2
University of Antique	1
Capiz State University	25
UP Visayas	6
Ateneo de Manila University	4
UP Diliman	1

One hundred thirty-five (135) patent/utility model registration applications filed at IPO

FAQs on IPR Assistance Program, please visit:

<http://techtrans.gov.ph/how-we-serve/service-sample-6/>

Outline

- STI Ecosystem
- Enabling Technology Transfer
- **Mechanisms for Translating Research**
- Some Examples of Translated Research

Food Innovation Centers (FIC)

✓ Facilities open to assist food entrepreneurs, producers, processors, marketing groups



Vacuum Fryer



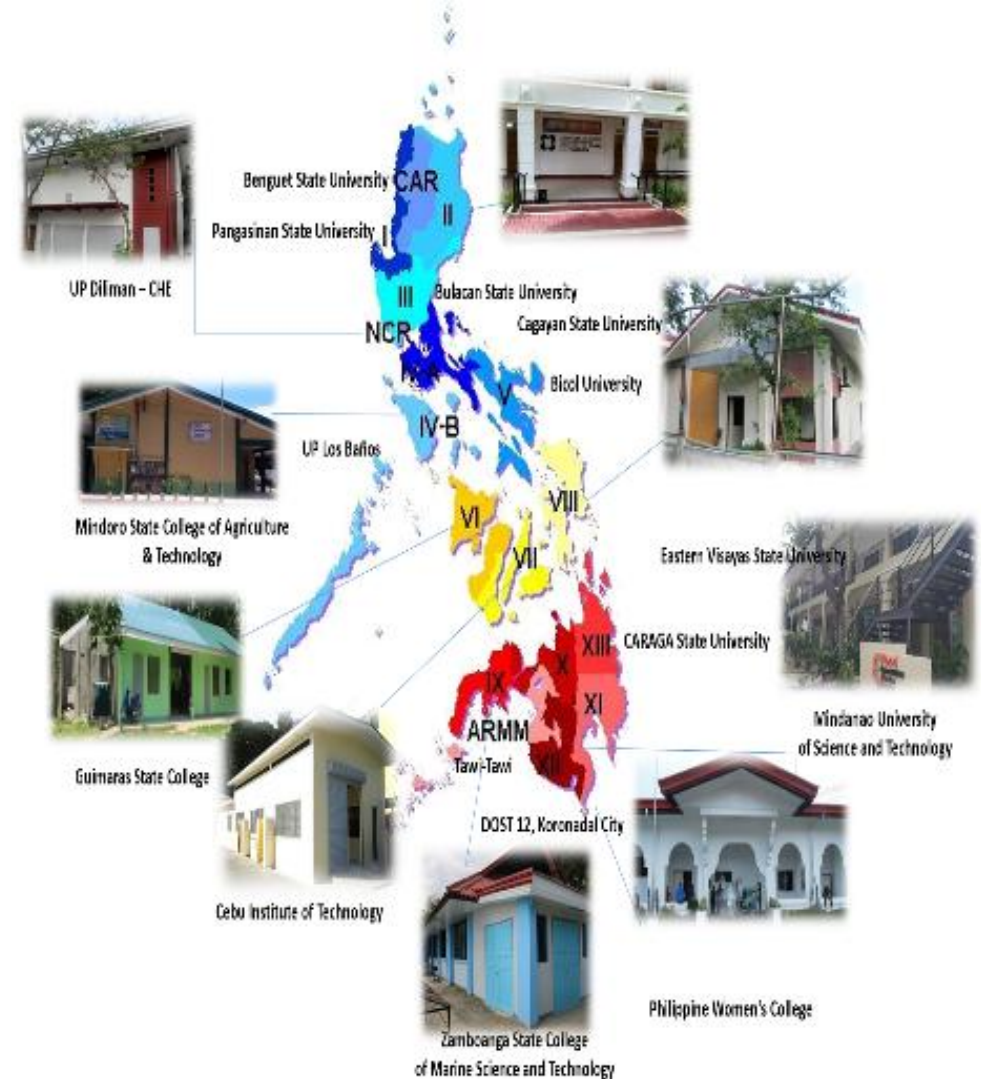
Freeze Dryer



Water Retort



Spray Dryer



✓ 18 FICs, 1 in every region with DOST-developed food processing equipment

Food Innovation Centers (FIC) Products



Vacuum Fryer



Spray Dryer



Water Retort



Freeze Dryer



Food Innovation Centers (FIC)

Most Innovative Products



Water Retort



Spray Dryer



Vacuum Fryer



Freeze Dryer

Food and Nutrition



Technology Transfer Training on the Production of the Bakery Product with Squash in Eastern Samar



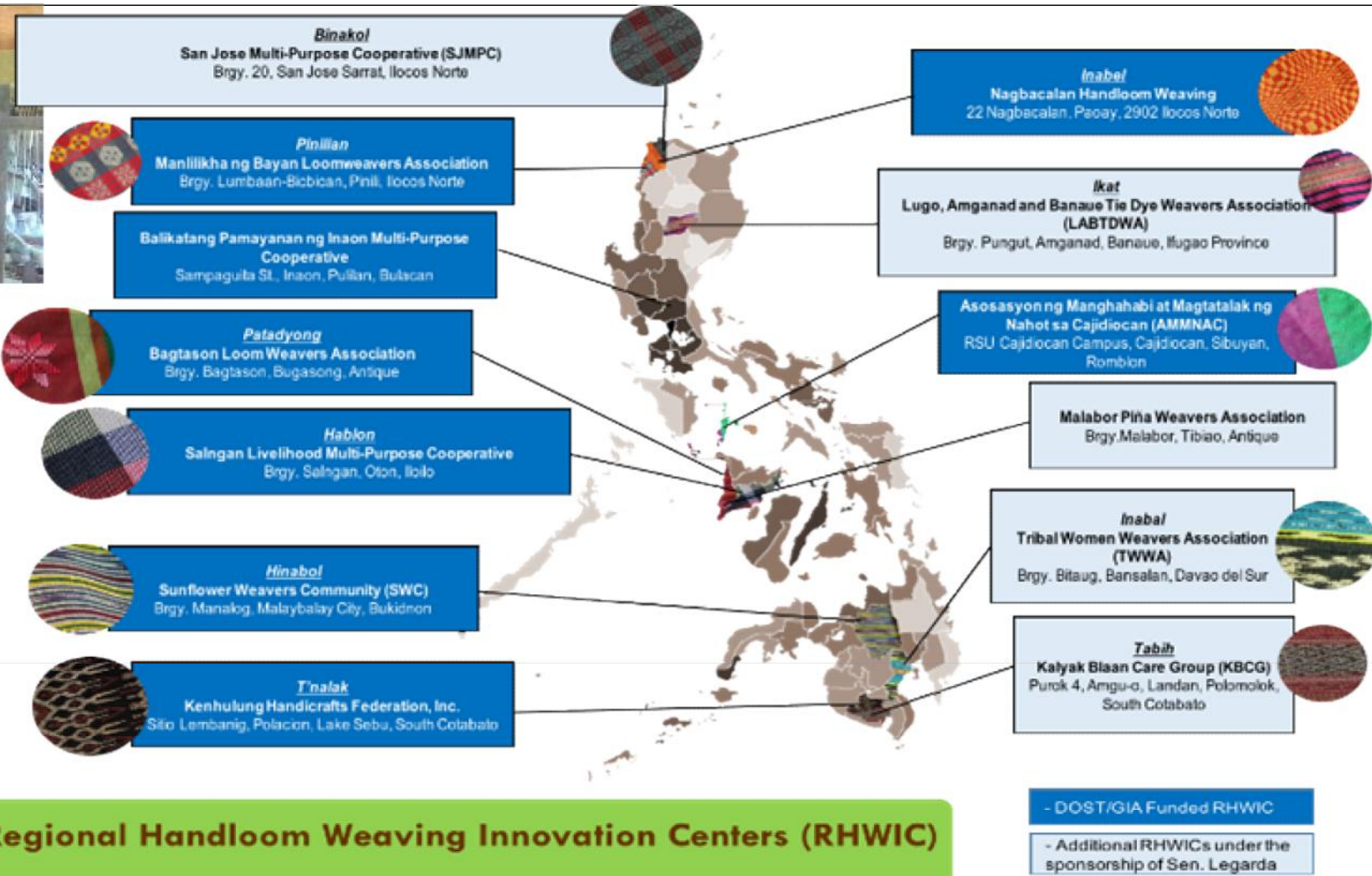
- ✓ Conducted **6 Fora for business opportunities** featuring selected FNRI technologies ready for transfer and its services conducted
- ✓ Signed **9 Technology Licensing Agreements** (TLAs)
 1. Pancit Canton with Squash
 2. Pancit Canton with Seaweeds
 3. Bakery Products with Squash (6 adoptors)
 4. Stabilized Brown Rice



Training on the production of Bakery Products with Squash
Odiongan, Romblon

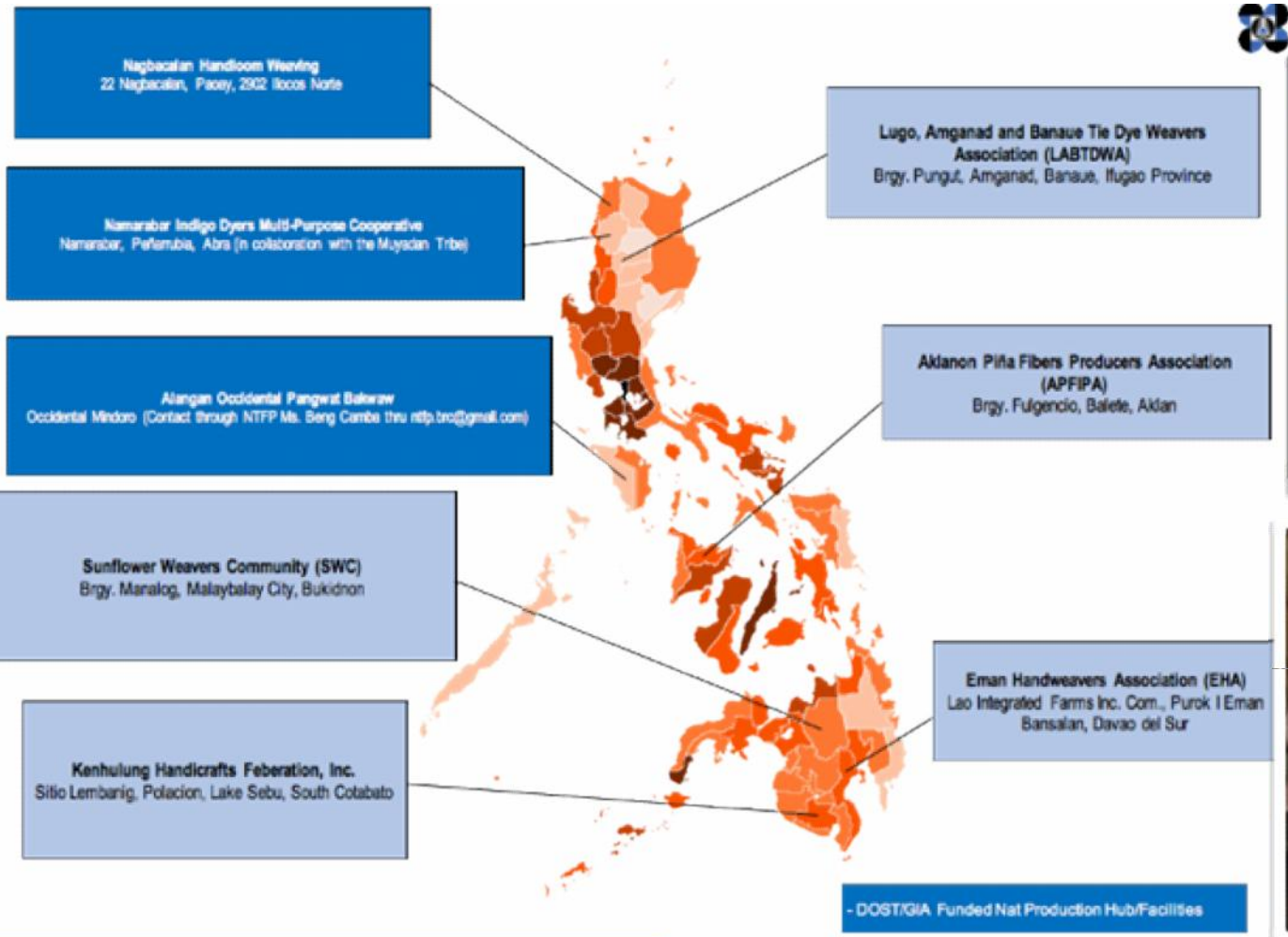
Regional Handloom Weaving Innovation Centers

✓ Established **13 Regional Handloom Weaving** Innovation Centers (RHWICs)



Natural Dye Production Hub

✓ Established 8 Natural Dye Production Hub and Facilities



Natural Dye Production Hub and Facilities

- DOST/GIA Funded Nat Production Hub/Facilities

- Additional NatDye Production Hub/Facilities under the sponsorship of Sen. Legarda



Forest Products

Bamboo Treatment and Preservation



- ✓ **28 residents** trained
- ✓ **operates 27 giant windmills** that generate a total of **150 gigawatt hours** of energy.



Training on Bamboo Handicraft Making for PWDs & IPs

- ✓ **40 PWDs and 2 Indigenous Persons** trained

Dryer for Wooden Caskets



DOST-FPRDI installed a 5,000 bd ft-capacity furnace-type lumber dryer for the King Jude Metal Caskets & Accessories

Metals

- ✓ Capability building on Effective Patent Filing
- ✓ Building of IP/Technology Transfer Materials
- ✓ Development of MIRDC IP Protocol



2017 M&E WEEK Celebration



Promotion of DOST-MIRDC-developed Technologies during M&E Week Exhibit (19-22 June 2017)

Venture Financing Assistance

Technology Application and Promotion Institute (TAPI)

CY 2010 to June 2017:

- ✓ assisted and supported **64 MSMEs and testing laboratories**
- ✓ generated **426 employment**



Biotek-M Dengue Aqua Kit



Production site of the Redsea Seafood Delights, Inc.



Adopting Appropriate Technologies for a Zero Emission, Zero Discharge Waste Management System for Gold Label Farm

Science and Technology Application in Rural Development (STARDEV) Assistance

Technology Application and Promotion Institute (TAPI)

- * From CY 2010 to June 2017, there are already **36 technologies** validated/tested and livelihood/pilot plant established



Livelihood project on Banana Chips Processing for the Sitio Lagunlong Community Development Organization

Development of an Industrial Fused Disposition Modeling (FDM) Printer (Design Center of the Philippines)

TECHNiCOM

Technology Innovation for Commercialization

✓ 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.

* From CY 2013 to 1st Semester of 2017, there were already **16 completed projects** assisted under TECHNICOM.



Botanical Dewormer for Free Range Native Chickens, CSU-Dumarao



VSU's processing of dried grates and flour made from fresh cassava roots is scaled up to produce food products such as esposol, cassava sticks, cassava cupcakes and cookies



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)



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)



Shelf life expansion of fortified ready to drink tropical fruit and vegetable juice blends of UP Diliman prepared by Assistant Processing and Packaging



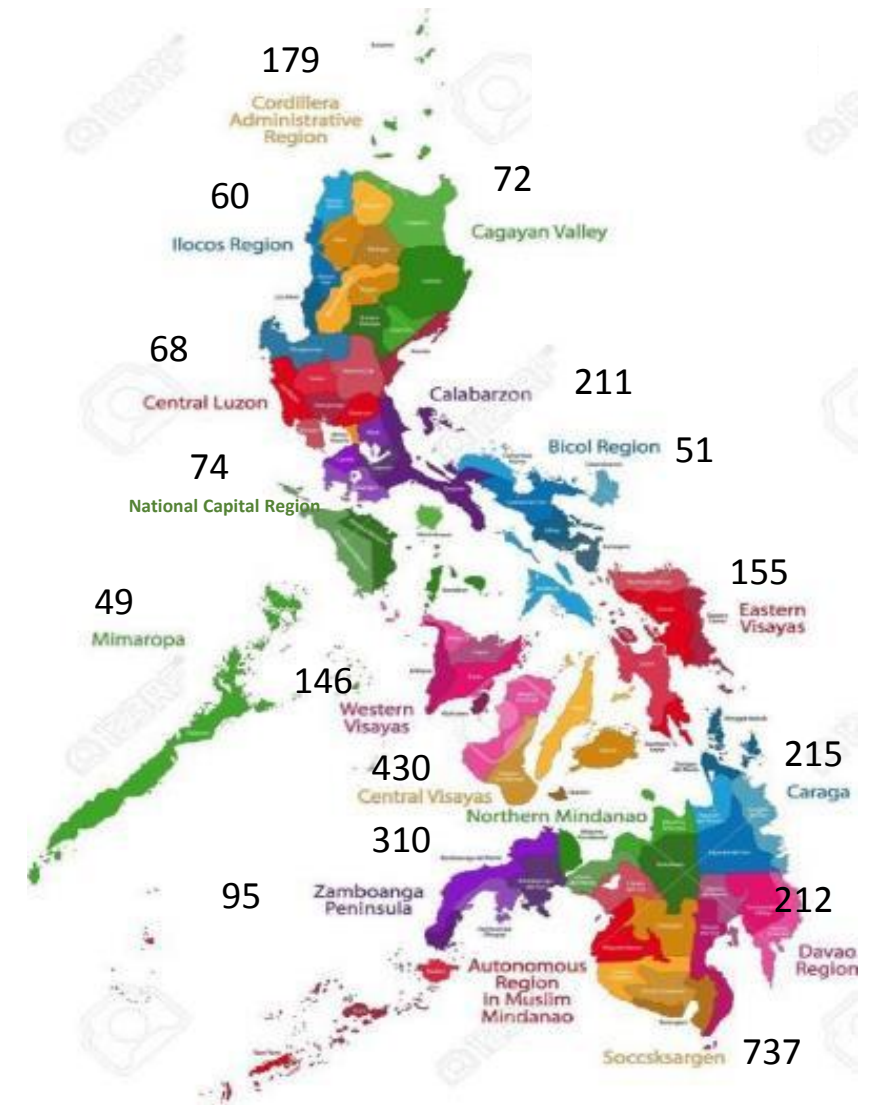
Neo-ethnic Philippine textile products of the DOST-PTRI (the convergence of science, art and tradition)



SETUP

S & T innovations for MSMEs

Small Enterprise Technology Upgrading Program

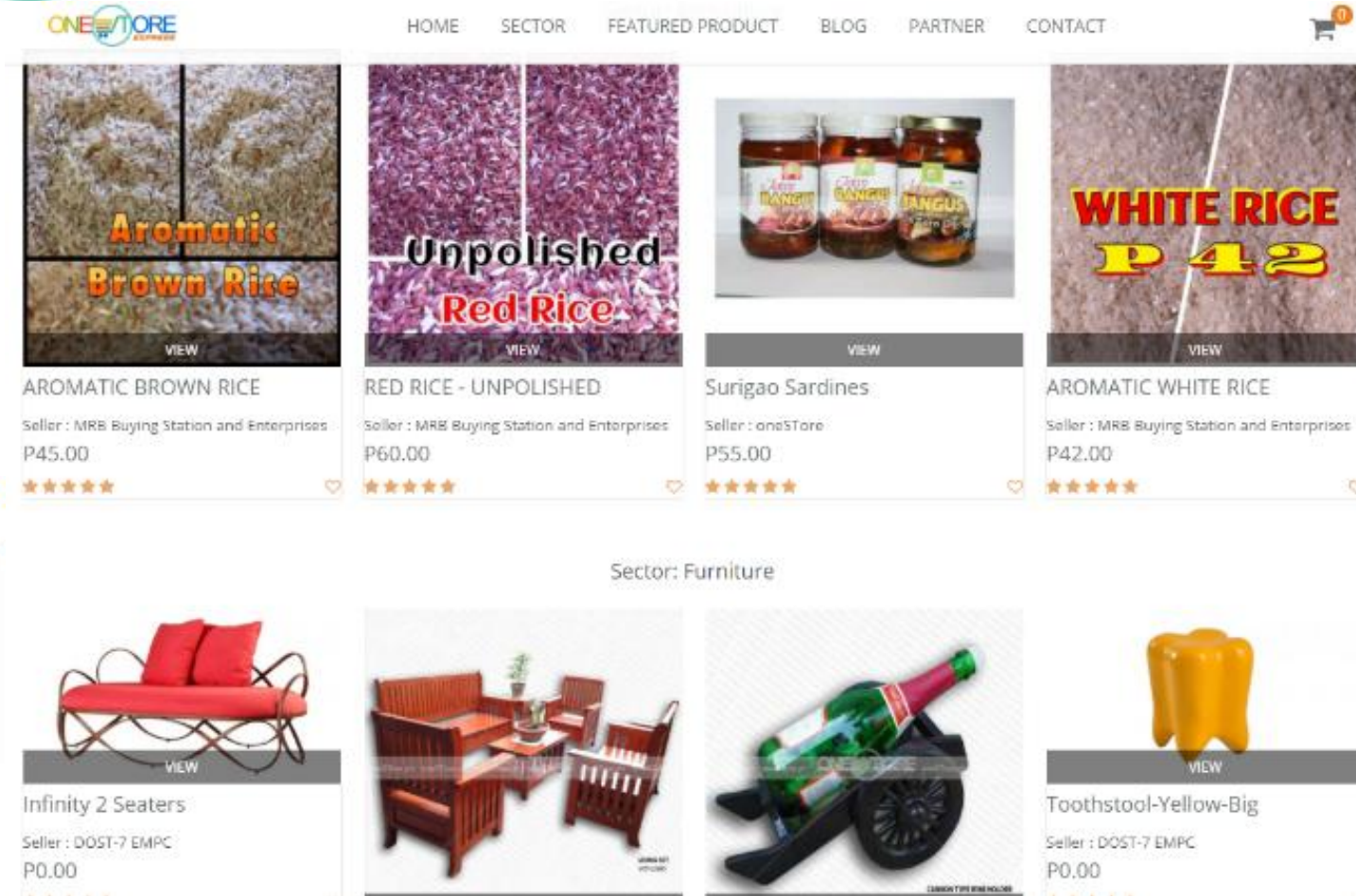




<http://onestore.ph/>

- ✓ 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

oneStore Partners:



- ✓ *helps the DOST-assisted Micro, Small and Medium Enterprises (MSMEs) widen the scope of their target market*



Collaboration with Other Government Agencies

- ✓ **377** active MOUs/MOAs
- ✓ **23** MOUs/MOAs (pipeline)



IFEX

May 19-21, 2017, World Trade Center



Senator Patricia V. Azanza (L), DOST-ITDI Director, and Engr. Norberto Ambagan, DOST-ITDI Chief (R) @ the DOST-ITDI Booth, FOOD TAIPEI.



Senator Cynthia Villar (in red top) joins guests during the opening ceremony of the IFEX exhibition.



Featured Technologies:

1. Water retort

- Bangus in oil
- Red chili oil infused with garlic
- Red chili oil infused with ginger
- Red chili oil infused with onion
- Red chili oil infused with anchovy

2. Spray-dryer

- Pinakurat or spiced vinegar
- Cucumber-calamansi juice

3. Vacuum fryer

- Okra
- Carrots
- Jackfruit

4. Drum-dried mango flakes

5. Drum-dried macapuno flakes

6. Cacao tablea

Delicious and healthy food products made from locally available raw materials by the DOST-ITDI were among the attractions in two international food shows, namely: (i) International Food Exposition (IFEX Philippines) held last May 19 to 21, 2017 at the World Trade Center and Philippine Trade Training Center in Pasay City, Metro Manila; and (ii) FOOD TAIPEI (27th Taipei International Food Show) held on May 19 to 21, 2017 at the Taipei Nangang Exhibition Center, Hall I and TWTC Hall I. The featured products, made using DOST-designed machines, attracted considerable interest in both events. Initial data showed that vacuum-fried okra topped the list at IFEX while drum-dried fruit flakes were top at FOOD TAIPEI.



Negosyo Convention Center

June 22-24, 2017, SM Megatrade Hall



Featured technology(ies):

1. Water retort
 - Bangus in oil
2. Spray-dryer
 - Pinakurat or spiced vinegar
 - Cucumber-calamansi juice
3. Vacuum fryer
 - Okra
 - Carrots
 - Squash
4. Drum-dried mango flakes
5. Drum-dried *macapuno* flakes
6. Drum-dried banana flakes
7. Ready-To-Drink cacao *tablea*

Taipei International Food Show

June 27-30, 2017, Taipei, Taiwan

- ✓ Organized by the Taiwan External Trade Development Council (TAITRA)
- ✓ Considered as one of the Asia's leading food show.
- ✓ (DTI-CITEM) together with DOST-ITDI joined the exhibit showcasing the products made using the Philippines' state-of-the-art food technologies and equipment.
- ✓ There were eight potential equipment suppliers for FIC Technologies

NSTW 2017

July 12-15, World Trade Center

Segment 1 “From Farm to Table: Innovations in Food Sustainability through S&T”

- Cacao tablea
- Cassava modified starch
- Banana flakes
- Ready-to-Eat banana roll
- Banana slices
- Frozen durian
- Kape Primera
- Ifugao Rice

Segment 2: “Moving People and Meeting Global Standards”



Tryk ni Juan

Segment 3: “Industry and New Frontiers”

Interactive modules on ITDI
testing facilities

- Rubber Testing Laboratory
- Packaging Technology Laboratory
- National Metrology Laboratory
- Advanced Device and Material Testing Laboratory
- Food Innovation Center (FIC) Main

Segment 4: “Disaster Risk Mitigation/ Reduction: Preparing for The Big One”

- Emergency Food Reserve (EFR)
- Ready-To-Eat Arroz Caldo
- Ready-To-Eat Boiled Sweet Potato
- Monay





Luzon
Visayas
Mindanao

Cebu
Isabela

CDO



TECHNOLOGY
TRANSFER DAY

Promoting
Research and
Outstanding
Milestones in
Innovation and
Science for
Entrepreneurship

Organized **Six (6)** Technology Transfer Day since April 2016

to promote the transfer and adoption of DOST technologies into the mainstream market



1st Technology Transfer Day

Hotel Sofitel, Pasay - 27 April 2016



- ✓ **6** – FORs signed
- ✓ **760** attendees
- ✓ **14** terms sheets
- ✓ **197** inquiries

2nd Technology Transfer Day

Ormoc Superdome - 14 September 2016



- ✓ **1** – FORs signed
- ✓ **718** attendees
- ✓ **19** terms sheets
- ✓ **58** inquiries

3rd Technology Transfer Day

SMX Convention Center – Davao, 13 December 2016



- ✓ **8** – FORs signed
- ✓ **418** attendees
- ✓ **19** terms sheets
- ✓ **53** inquiries

4th Technology Transfer Day

Waterfront Hotel - Cebu - 20 June 2017



- ✓ **6** – FORs signed
- ✓ **332** attendees
- ✓ **16** terms sheets
- ✓ **89** inquiries

5th Technology Transfer Day

Santiago City, Isabela – 24 August 2017

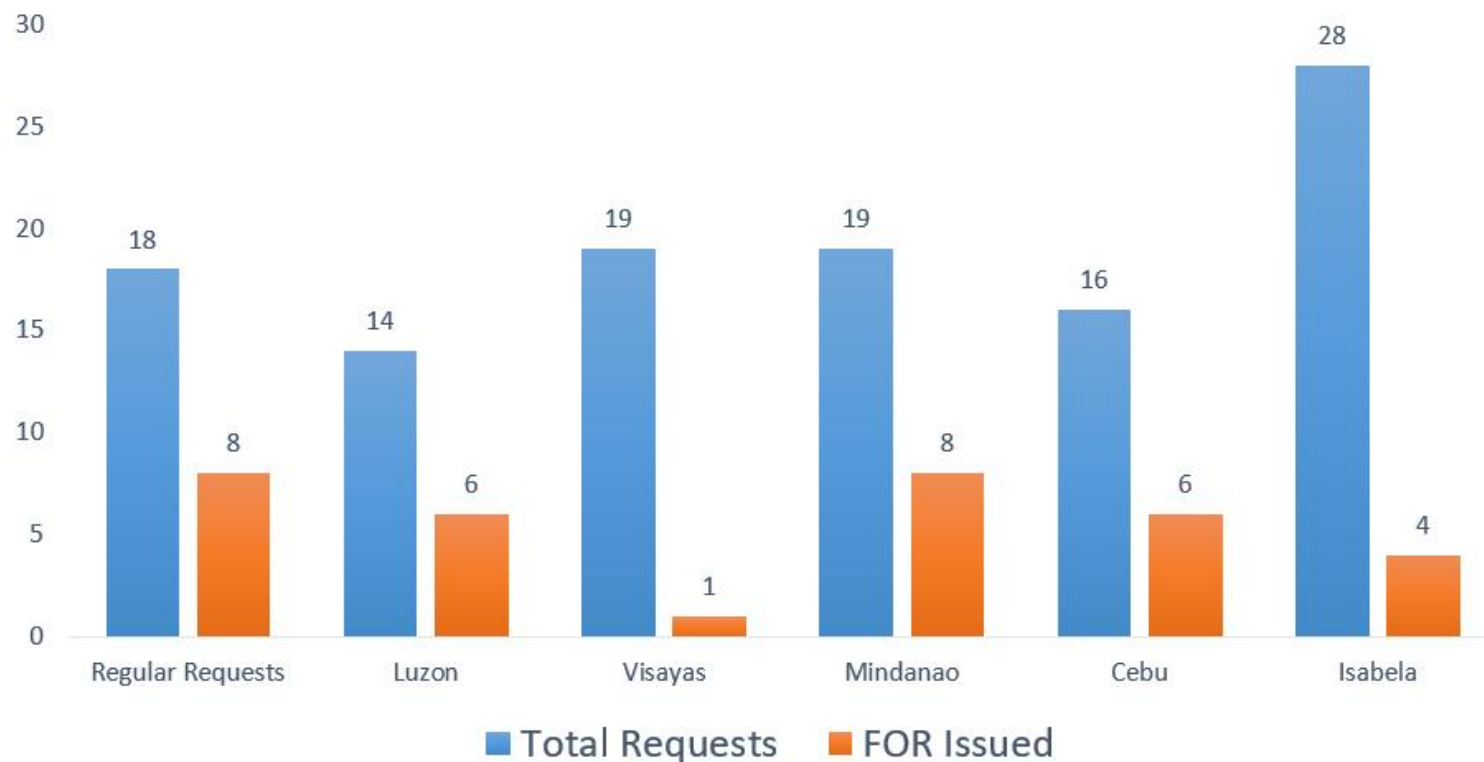


- ✓ **4** – FORs issued
- ✓ **4** - Provisional FOR issued
- ✓ **497** attendees
- ✓ **28** terms sheets
- ✓ **56** inquiries

Results of the Tech Transfer Day

Received a total of **one hundred fourteen (114)** requests for issuance of Fairness Opinion Report (FOR) of which **thirty-three (33)** were issued with fairness opinion and certificate by the DOST Secretary.

FOR Issued as of September 5, 2017



Technology Transfer Day in Luzon Cluster	Sofitel Philippine Plaza Manila, Pasay City (27 April 2016)
Technology Transfer Day in Visayas Cluster	Ormoc Superdome, Ormoc City, Leyte (14 September 2016)
Technology Transfer Day in Mindanao Cluster	SMX Convention Center, SM Lanang, Davao City (13 December 2016)
Technology Transfer Day in Cebu City	Waterfront Hotel, Lanang, Cebu City (20 June 2017)
Technology Transfer Day in Santiago City, Isabela	Jen Hotel, Santiago City, Isabela (24 August 2017)

6th Technology Transfer Day

Cagayan de Oro City – 08 September 2017



- ✓ **20** Provisional FOR issued
- ✓ **18** Recommended for Full-blown
- ✓ **537** Attendees
- ✓ **52** Terms sheets



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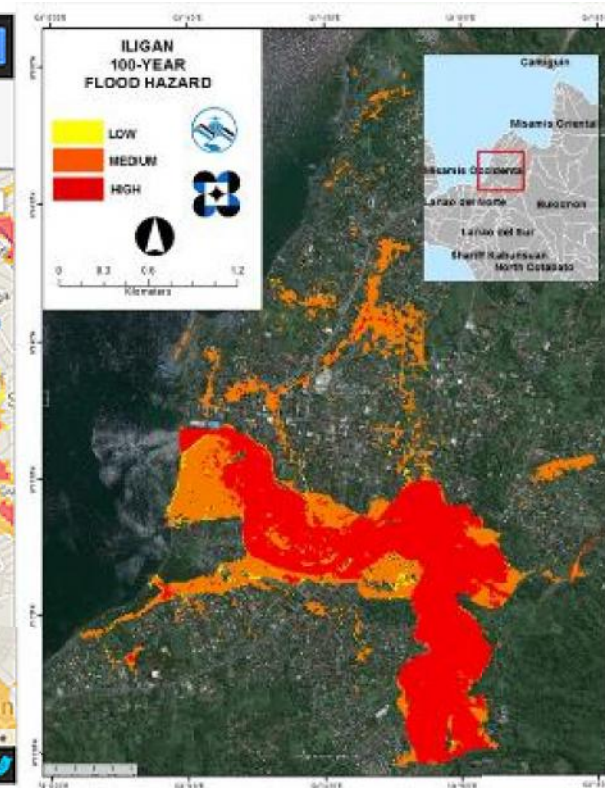
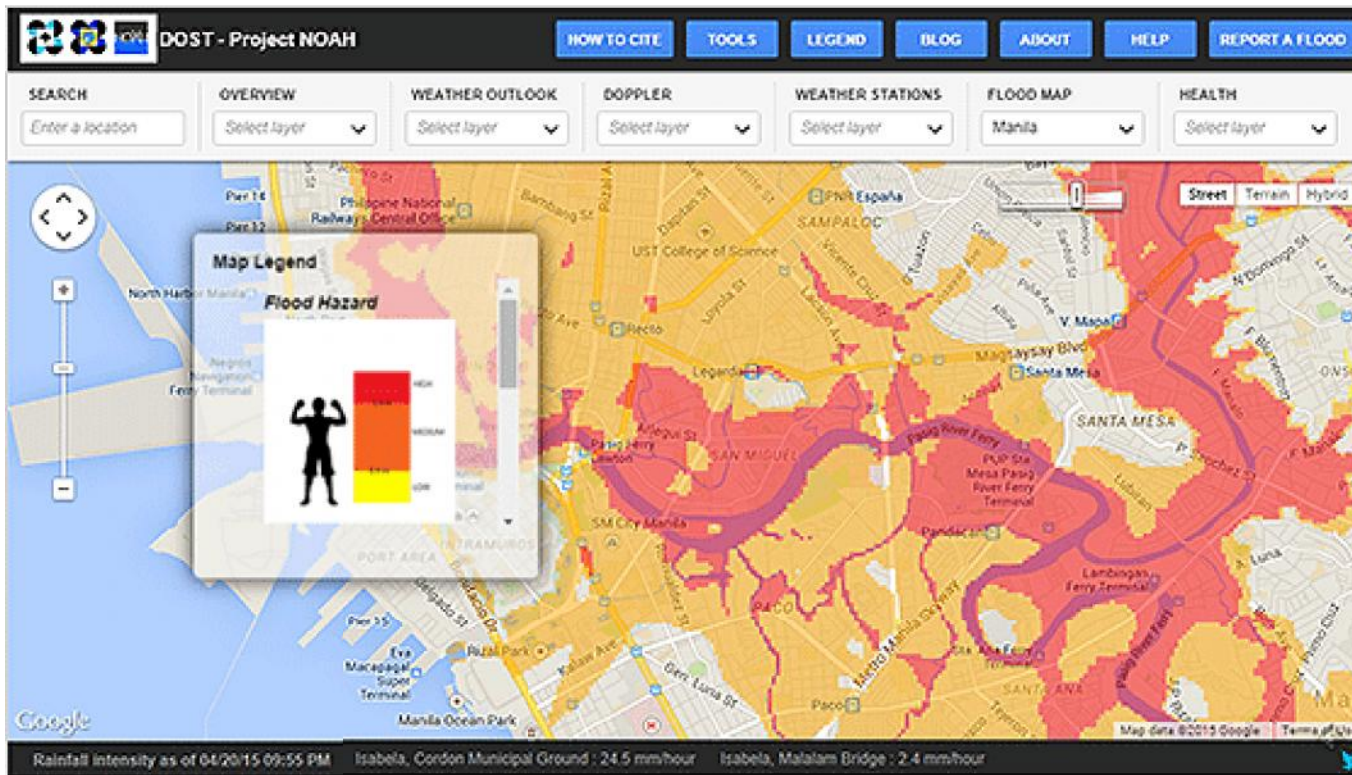


Flood Hazard Maps



Philippine Light Detection and Ranging (Phil-LiDaR) Program

Disaster Risk and Exposure Assessment for Mitigation (DREAM) Program and the



✓ *flood hazard maps were distributed to 548 LGUs all over the country.*



Ready-to-Eat Emergency Food Products

- ✓ Lightweight and very handy packaging; shelf stable for at least one (1) year
- ✓ Can withstand aerial distribution of about 800 to 1000 ft.



CHICKEN ARROZ CALDO

- 180 calories per 200g pouch
- First stage emergency food
 - can be consumed immediately after emergency when water and utilities are not available



RICE MEALS

- 260 calories per 200g pouch
- Second stage emergency food
 - can be consumed when water and utilities are already restored



Technology Generator: Industrial Technology Development Institute

Iron Fortified Rice and Iron Rice Premix



Technology Generator: Food and Nutrition Research Institute

Monascus Red Colorant

- Natural colorant to substitute synthetic red dyes
- Tested and validated safe for consumption
- Soluble in water and alcohol
 - ▶ 2 years shelf-life
 - ▶ For beverage, meat, and bakery applications



Technology Generator: UP Los Baños - Biotech



Complementary Food Rice-Mongo-Sesame Baby Food Blend

Prepared into porridge by boiling for 8-10mins with continuous stirring

- 140 kcal energy and 4 g protein per 30g pack
- Recommended serving: 2 sachets per day



Technology Generator: Food and Nutrition Research Institute



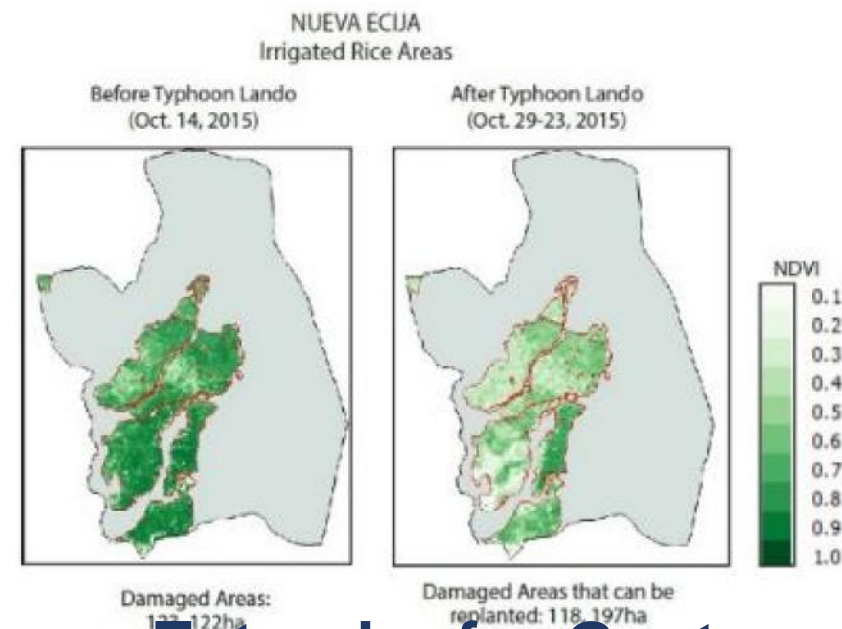
Itik Pinas



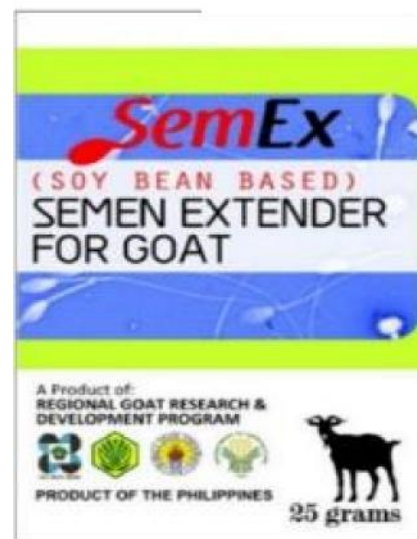
Artificial Insemination for Goat



SARAI-Enhanced Agricultural Monitoring System (SEAMS)

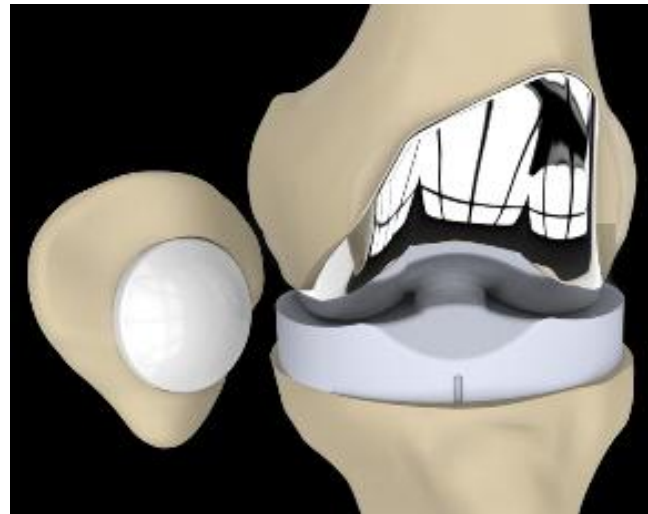


Semen Extender for Goat



Axis™ Knee system

- ✓ a **total knee replacement system** that is specifically designed for the Asian population.
- ✓ *very affordable, as it costs 50% less than other knee implants in the market.*



Carrageenan Plant Growth Promoter



- ✓ **enhances the crop vigor of rice** through the promotion of plant growth, seed germination, shoot elongation, root growth, flower production, suppression of heavy metal stress, and anti-viral and anti-microbiological activities

STABILIZED BROWN RICE = Healthy Food CHOICE + Business Opportunity



VIGORMIN

A mixture of **organo minerals** proven to be effective in **neutralizing strong wastewater** or septic odor. The solution can also neutralize strong, decomposing or rotten odor from organic waste in landfill or material recovery facilities.



[://boracaysun.com/organic-mineral-aids-boracay-in-waste-management/](http://boracaysun.com/organic-mineral-aids-boracay-in-waste-management/)



Organo minerals Pilot Production Plant at Tanauan, Batangas



Inauguration of the Pilot Plant last May 2, 2017



Department of Science and Technology

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