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Technology Transfer Modalities in the Philippines: Research to Market Stories in DOST-TAPI

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And

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Presented by

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Outline of Presentation

- Background of DOST-TAPI
- Legal and Policy Frameworks
- Landscape of DOST Programs and Services
- Technology Transfer Modalities: DOST-TAPI Benificiaries' Experiences

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DOST -TAPI

- Created by virtue of Executive Order 128 on January 30, 1987.

- Serves as implementing arm of the Department of Science and Technology (DOST) in promoting the commercialization of technologies and marketing the services of the other operating units of the Department.

- Provides grants and/or venture financing assistance for new and emerging projects.

DOST-TAPI

- On 28 April 1992, RA 7459, or the “Inventors and Inventions Incentives Act of the Philippines” as signed into law expanding the functions of TAPI

- Provide technical and financial assistance and other incentives under RA 7459 to inventors and its organization on invention related activities such as, patenting and licensing services

- Promote invention/innovation to facilitate the commercialization

DOST Agencies/Units

3 Sectoral Councils

- PCAARRD
- PCIEERD
- PCHRD

2 Advisory Bodies

- NAST
- NRCP

16 DOST Regional Offices

7 RDIs

- ASTI FNRI
- FPRDI ITDI
- MIRDC PNRI PTRI

6 Service Institutes

- PSHS
- PHIVOLCS
- PAGASA
- SEI
- STII
- TAPI

Legal and Policy Frameworks

1. 1987 Constitution of the Republic of the Philippines
2. Executive Order 128
3. Republic Act 7459 or 1992 Inventors and Invention Incentives Act of the Philippines
4. Republic Act 8293 or the Intellectual Property Code of the Philippines of 1998
5. Republic Act 9168 or the Philippine Plant Variety Protection Act of 2002
6. Republic Act 10055 or the Technology Transfer Act of 2009

Legal and Policy Frameworks

Republic Act 7459

This law provides as national policy, priority to invention and its utilization on the country's productive systems and national life. To this end, the government provides incentives to inventors and protect their exclusive right to their invention, particularly when the invention is beneficial to the people and contributes to national development and progress.

Legal and Policy Frameworks

Republic Act 7459

This legal framework created the following platforms of support for inventors and innovators thru DOST-TAPI

- Cash Rewards and Awards for Inventions
- Tax Incentives and Exemptions
- Invention Development Assistance Fund
- Invention Guarantee Fund

Loan assistance extended by government banks for the commercial production of an invention, either locally or for export and duly certified by the Filipino Inventors Society and the Screening Committee

Provided, that said invention meets the criteria that would enhance the economy of the country such as profitability and viability, dollar-earning capacity, and generation of employment opportunities for Filipinos

Legal and Policy Frameworks

Republic Act 10055

This Act provides for the framework and support system for the Ownership, Management, Use, and Commercialization of Intellectual Property generated from research and development funded by government.

The scope and objectives of the Act address the following:

- Technology Transfer as Strategic Mission of RDIs
- Transfer of Technology thru Management of IPR and private Sector Collaboration
- Access to Technologies and Data

Legal and Policy Frameworks

Republic Act 10055

This Law provides comprehensive rules and guidelines for the utilization of government-funded technologies, specifically thru the following salient provisions on:

1. Intellectual Property Ownership

2. Rights and Responsibilities of the Government Funding Agencies and Research and Development Institutes

- Fairness Opinion Report
  Research Funding Agreement
- Protection of Undisclosed Information
- Disclosures

Legal and Policy Frameworks

Republic Act 10055

This Law provides comprehensive rules and guidelines for the utilization of government-funded technologies, specifically thru the following salient provisions on:

3. Management of IPs from R&D performed by Government RDIs through their Own Budget
4. Revenue Sharing
5. Commercialization by the Researcher and Establishment of Spin- Off Firms
6. Use by Government, Compulsory Licensing and Assumption of Potential IPRs
7. Use of Income and Establishment and Maintenance of Revolving Fund for R&D and Technology Transfer
8. Institutional Mechanism

Landscape of DOST Programs & Services

Programs of Sectoral Planning Councils

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

- Support for Research and Development
- Policy Development and Advocacy
- Information Dissemination
- Support for Technology Transfer
- Institution Development
- Human Resource Development

Landscape of DOST Programs & Services

Programs of Sectoral Planning Councils

Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD)

- Strategic R&D focusing on agriculture, forestry, aquatic, and natural resources sectors
- Science technology-adoption link.
  - Science & Technology-Based Farms (STBF)
  - Science & Technology Community-Based Farms (STCBF)
  - TechnoMart (TM)
  - Science & Technology Model Farm (STMF)
  - S&T Action Frontline for Emergencies and Hazards Program (SAFE)
- Policy Research and Advocacy
- Capacity Building and R&D Governance

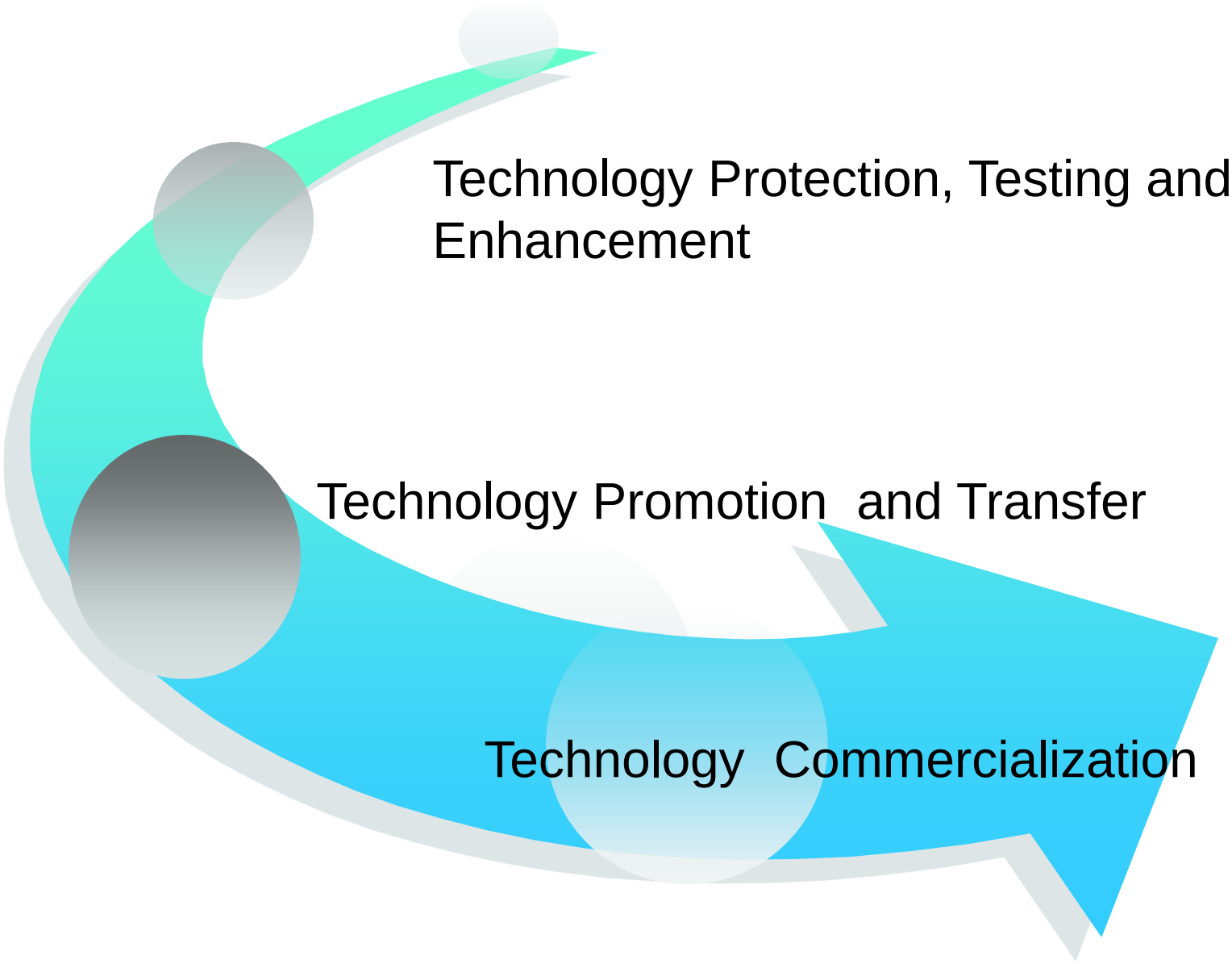
Landscape of DOST Programs & Services

Programs of Sectoral Planning Councils

Philippine Council Health Research and Development

- Research and Development Grant (National Unified Health Research Agenda)
  - *Health Technology Development*
    - Diagnostics
    - Genomics/Molecular Technology
    - Drug Discovery Development
    - Functional Foods
    - Hospital Equipment and Biomedical Devices
    - Information and Communication Technology (ICT) for Health
  - *Health Financing*
  - *Health Service Delivery*
- Research Utilization
- Philippine Health Research Ethics Board
- Information Services

Programs and Services under TAPI



DOST-TAPI Programs & Services

Technology Protection, Testing and Enhancement

•Intellectual Property Rights (IPR) Assistance Program

Protection of intellectual property is a crucial preliminary step in technology transfer and commercialization. TAPI provides assistance in patent consultation and provides grants for the payment of Patent Agents and IPO's fees.

•Technology Innovation for Commercialization (TECHNICOM) Program

Provides holistic support to interested proponent with commercially-viable technologies. Through financial and technical assistance, the Program fast tracks the market-readiness of technology for eventual transfer and commercialization.

•Invention-based Enterprise Development (IBED) Program

A follow-through activity to push and transform innovations into a technology enterprise. It covers pilot production, field/market testing and formulation of systems and procedures in preparation for a larger production scale. It aims to build the capabilities of inventors to create businesses out of their inventions.

DOST-TAPI Programs & Services

Technology Promotion and Transfer

. Institutional Support for Trade and Exhibitions (ISTE) of DOST Technologies and Services

A platform for the dissemination, sharing and exchanging of information and ideas involving S&T development of various sectors. It provides a venue for highlighting the accomplishments of scientists, inventors and researchers. Regional and National level celebrations of Science and Technology Week are conducted annually

- **Technology Transfer Day**

Provides technical and financial supports to technology generators for the promotion on the market-readiness of technologies funded by government institutions. Technologies are pitched to invited industry sectors or potential adopters. The program is in support of the Technology Transfer Act (RA10055)

- **Regional and National Invention Contests and Exhibition**

Conduct of biennial celebrations to promote invention and innovations in support of Inventors and Inventions Incentives Act (RA7459)

DOST-TAPI Programs & Services

Technology Commercialization

.Venture Financing Program

Accelerates the initial commercialization of emerging and new technologies developed by the S&T community by providing the necessary funding support to micro, small and medium (MSMEs) for start-up and scale-up projects

•Invention Guarantee Fund

Provides financial supports to inventors for commercialization of their inventions. Thru the fund, The Land Bank of the Philippines (LBP) and TAPI implement the joint program “LANDBANK-TAPI Innovation and Technology (I-TECH) Lending Program . This is in support to Inventors and Inventions Incentives Act (RA7459)

Technology Transfer Modalities

Creation of Spin-off/Start-Up Companies from University/RDI-developed Technologies

. Health Diagnostic Sector : Biotek-M Dengue Aqua Kit
Developed by: Dr. Raul V. Destura of University of the Philippines – Manila

Description of the technology:
The Biotek-M™ Dengue Aqua kit provides for early and highly accurate detection of dengue diseases. It is a part of the “Lab-in-a-Mug Project” wherein all diagnostic kits are integrated and miniaturized in an isothermal unit as small as a mug. IP protected technology for detection of pathogens (mixture and primer).
Features:
Competitiveness: The successful roll-out of the kit proves that the technology is comparable if not superior to existing foreign competitors.

- Rapid and Reliable
- Practical in the field where only basic laboratory capabilities are present
- Cheaper (The technology offers competitive price in the market. The current pricing estimates is about 50-75% lower than existing foreign-based competition.

Technology Transfer Modalities

Creation of Spin-off/Start-Up Companies from University/RDI-developed Technologies

. Health Diagnostic Sector : Biotek-M Dengue Aqua Kit

Assistance by DOST from Technology Development to Commercialization

DOST-PCHRD: R&D phase of the technology including clinical trials

TAPI-TECHNICOM Program: funded technology enhancement for commercial scalability, including market-testing/deployment to 100 health facilities nationwide

TAPI's Venture Financing Program: Financing loan for the acquisition of production equipment to eliminate outsourcing and to optimize, upgrade and automate the process to attain high throughout production

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For assistance in the future thru IGF support

Technology Transfer Modalities

Creation of Spin-off/Start-Up Companies from University/RDI-developed Technologies

. Health Diagnostic Sector : Biotek-M Dengue Aqua Kit

Major Challenges Encountered

Regulation: The team had to hurdle FDA approval for testing/roll-out of the device, which took considerable time since development and testing of diagnostic device in the country is new.

Facility: Lack of established manufacturing site in the country for molecular-based product necessitated the team to convert existing facility in the University which entailed additional time and resources, including additional decontamination activities.

University Procurement Policies. Some delays were encountered due internal procurement policies. For example: completing the three (3) quotation rule for suppliers. In some cases, the quotations would expire even before the three quotations could be completed.

Technology Transfer Modalities

Creation of Spin-off/Start-Up Companies from University/RDI-developed Technologies

. Health Diagnostic Sector : Biotek-M Dengue Aqua Kit

Lessons Learned from the Project

- **University Spin-offs are Possible**
- **Tech-Transfer Readiness of RDIs is Vital**
- **Leadership Qualities Ensures Success**
- **Forge Partnerships and Hurdle Regulations**.
- **Testing and Promotion Influences the Market**
- **Government Support thru Early Adoption Essential**
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Technology Transfer Modalities

Creation of Spin-off/Start-Up Companies from University/RDI-developed Technologies

. Industry and Environment Sector : VigorMin: Organo Mineral Products for Effective Waste Water Treatment and Septic System Management
Developed by: Dr. Merlinda A. Palencia of Adamson University

Description of the Technology

Vigormin is a white powder mixture of naturally-occurring organo minerals that significantly stimulate the growth of the indigenous aerobic microorganisms in waste water and boost the degradation of organic pollutants. The mixture can absorb significant amounts of heavy metals and other suspended solids in the water.

The application of the product is also effective in neutralizing strong wastewater or septic odor, decomposing/rotten odor from organic waste in landfills or material recovery facilities.

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Assistance by DOST from Technology Development to Commercialization

DOST-PCIEERD: R&D phase and initial field-testing of the technology to various sites (i.e. Boracay, Aklan during APEC Summit and Palo, Leyte during post-Typhoon Yolanda recovery)

TAPI -TECHNICOM Program: funded pilot-scale production (rated 4metric ton capacity /day) and process optimization to assess the stability, efficiency and the effectiveness of the product in a larger scale set-up and likewise, verify results of the market and laboratory tests generated from previous studies.

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Major Challenges Encountered

Regulation and Permits: The processing of government permits and registration from different agencies (Local Government Unit and Regulatory Agencies) for the construction of the pilot plant took longer than anticipated, including processing of Tax and Duties exemptions. Because the plant commits to be compliant with all ISO and legal requirements for bidding process, purchase and completion of the facility were extended.

Weather Disturbances: Unfavourable weather condition (i.e. heavy rainfall and typhoons) caused delay in the completion of civil, mechanical and electrical works in the pilot facility

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Lessons Learned from the Project

- **Increase Focus on University Research with Commercial Value**
- **Endorsement from Government Agencies is Essential**
- **Information Campaigns for New Products – Necessary**
- **Product Development is a Continuous Process**
- **Part of Technology Success Depends Both on the Innovation and the Innovator**

Technology Transfer Modalities

Licensing of University/RDI-Developed Technology to Private Sector/Industry

BioGroe^{R} Technology
Developed by team spearheaded by Ms. Fe G. Torres and Mr. Ronilo Violanta from National Institute of Molecular Biology and Biotechnology (BIOTECH), University of Los Baños (UPLB)

Assistance by DOST from Technology Development to Commercialization \

DOST-PCAARRD: R&D phase particulary during screening and isolation PGPB for selected crops and initial field-testing of the technology to various sites

TAPI -TECHNICOM Program: funded intensive field-testing or efficacy trials for different crops needed for FPA registration in order to enhance and promote the technology and capacitate target beneficiaries.

Technology Transfer Modalities

Licensing of University/RDI-Developed Technology to Private Sector/Industry

BioGroe^{R} Technology
Major Challenges Encountered

Change in Leadership. The demise of the Project Leader during the project implementation was a challenge that the University and the whole project team had to cope up with because of the sudden need to fill-up necessary technical expertise.

Procurement Challenges with Government-run Universities. Delays in the procurement of critical materials happened due to challenges on internal procurement system. The project team had to revisit plan of activities and adjust accordingly to ensure project was on-track.

Erratic Weather Conditions. The project experienced delays in establishment of efficacy trails due to onset of rainy season and long dry spell during sunny season.

Technology Transfer Modalities

Licensing of University/RDI-Developed Technology to Private Sector/Industry

BioGroe^{R} Technology
Lessons Learned from the Project

- **Chances for Licensing Increase when Private Sector Forms Part of the Project during Technology Development and Enhancement**
- **Establish Clear and Fast Process for Approval of Licensing Agreement in Universities**
- **Support for Promotion and Expansion of Market Needed**
- **Support of Institutional Partners Critical**

Technology Transfer Modalities

Individual Inventor-Developed and Commercialized Technology

Leak Sealing Valve (LSV) for Brake System of Motor Vehicle
Developed by Mr. Melchor L. Heñosa of Heñosa Technologies

Description of the Technology

An anti-loose brake device attached along the brake fluid pipes of each brake assembly of the wheels particularly for PUV.
It has an automatic lock system for damaged assembly, avoiding loss of brake, and maintaining driver's directional stability and control over steering. This allows control over stopping distance.

IP Protection: Invention (Patent) - 1-2011-000312

Technology Transfer Modalities

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Technology Transfer Modalities

Individual Inventor-Developed and Commercialized Technology

Leak Sealing Valve (LSV) for Brake System of Motor Vehicle
Developed by Mr. Melchor L. Heñosa of Heñosa Technologies

Assistance by DOST from Technology Development to Commercialization

TAPI's Industry-based Invention Development (IBED) Program:
Financial assistance for the prototype development, pilot-scale production and market-testing of seventy (70) units of the device

TAPI's Invention-based Enterprise Development (IBED) Program:
Financial assistance for acquisition of critical raw materials (i.e. aluminium casting, housings, oil-seals, and other parts) and equipment (die casting mould) in order to produce and commercialize one hundred sixty (160) units of the device (LSV).

Technology Transfer Modalities

Individual Inventor-Developed and Commercialized Technology

Leak Sealing Valve (LSV) for Brake System of Motor Vehicle
Developed by Mr. Melchor L. Heñosa of Heñosa Technologies

Major Challenge Encountered
Ensuring Quality Assurance to produce high number of good quality for the increasing market demand.

Lessons Learned from the Program

- **Transition from Inventor to Entrepreneur**
- **Establishing Effective Credibility**
- **Exposure to Exhibitions and Marketing Platforms**
- **Lack of Standards and Certifying Bodies for Invention**

Technology Transfer Modalities

MSME: From technology Development to Commercialization

Coffee Roasting Machine
Developed by Mr. Carlos Basilio Victor O. Reyes of Bote Central, Inc.

Description of the Technology

This is a roasting apparatus with programmable settings that can quickly roast coffee beans, corns and other nuts. The technology provides a collecting chamber that can be easily used for coffee making and had been useful to a number of coffee shops.

This machine is considered more energy efficient as compared to other commercial roasting machines. It is ideal in size, capacity and design to cater to the requirements of countryside community and commercial outlets in metro cities.

IP Protection- Invention (Patent): 12009000174 issued last Oct. 11, 2011

Technology Transfer Modalities

MSME: From Technology Development to Commercialization

Coffee Roasting Machine
Developed by Mr. Carlos Basilio Victor O. Reyes of Bote Central, Inc.

Assistance by DOST from Technology Development to Commercialization

TAPI's Invention-Based Enterprise Development (IBED) Program: Loan assistance for prototype fabrication of initial two (2) units

TAPI's Venture Financing Program: Funding loan assistance for the fabrication of five (5) units of packaged coffee processing technology to be sold and distributed to various coffee growers

Technology Transfer Modalities

MSME: From technology Development to Commercialization

Coffee Roasting Machine
Developed by Mr. Carlos Basilio Victor O. Reyes of Bote Central, Inc.

Major Challenges Encountered

Unavailability of Standards: The inventor had to review previous designs he made every time there is a need for repair machines sold earlier because there was no available standard for fabrication of roaster machines.

Long and Stiff Processes with Government: The inventor's client was a national government agency. Because government agencies are bounded by strict provisions of the Procurement Law, the company had to undergo bidding process which took time and additional resources. For example, security and performance bonds, including retention fee were required.

Technology Transfer Modalities

MSME: From technology Development to Commercialization

Coffee Roasting Machine
Developed by Mr. Carlos Basilio Victor O. Reyes of Bote Central, Inc.

Lessons Learned from the Program

- **Establishing Credibility of Start-ups**
-
- **Equal Sharing of Risks thru Encouraging Loan Provisions and Structured Payment Scheme**

- **Assistance Improves Productivity and Market Acceptance**

THANK YOU!

For more information, please write or contact:

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