

Climate Resilience Infrastructure Technology Development, Upscaling and Deployment: Philippine Experiences and Prospects

Caezar Angelito E. Arceo

Technology Application and Promotion Institute (TAPI)
Department of Science and Technology (DOST)
Philippines

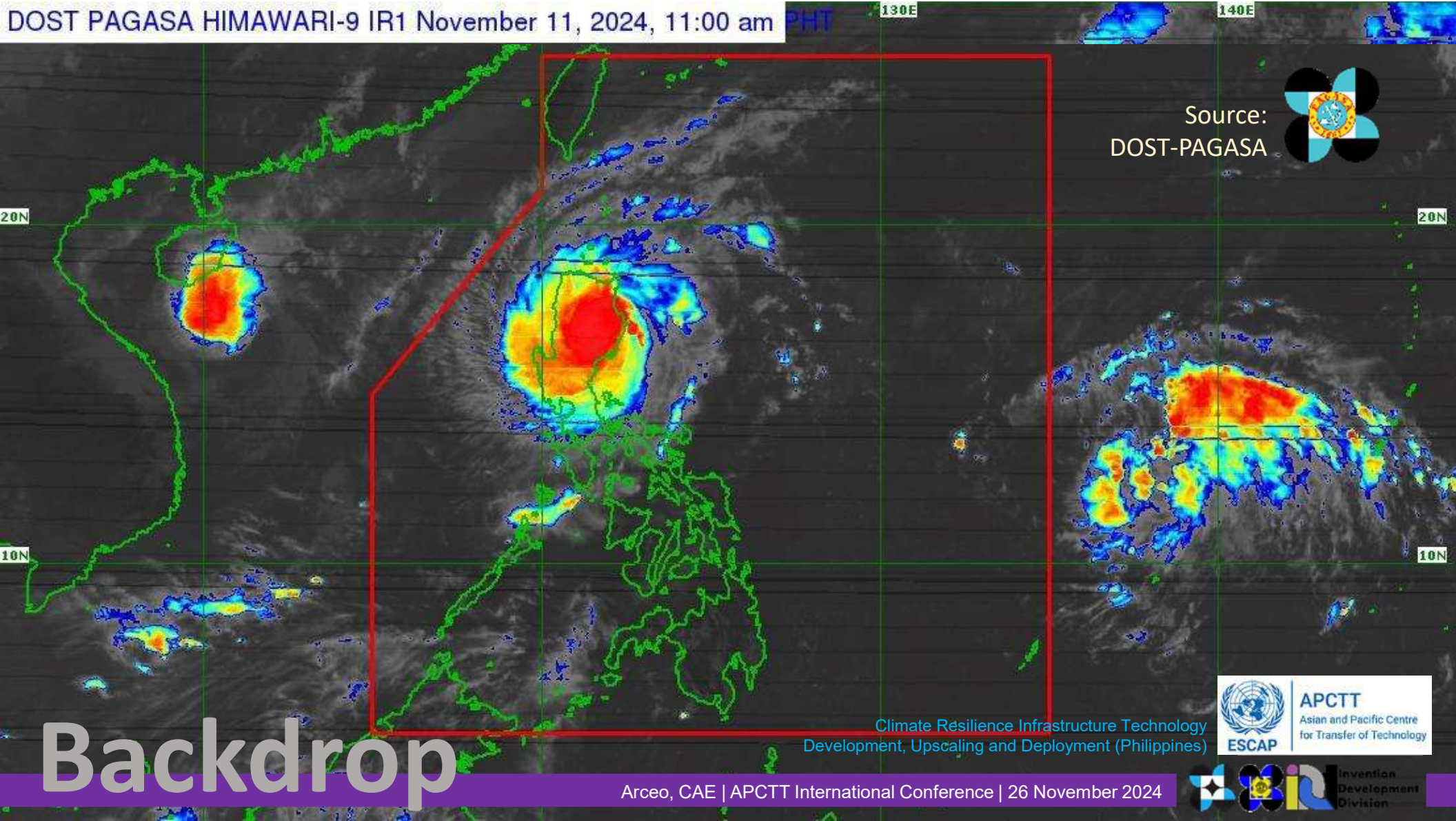
International Conference on Technologies for
Climate Resilience Infrastructure
26 November 2024 | Via MSTeams



APCTT
Asian and Pacific Centre
for Transfer of Technology



DOST PAGASA HIMAWARI-9 IR1 November 11, 2024, 11:00 am



Source:
DOST-PAGASA



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Climate Resilience Infrastructure Technology
Development, Upscaling and Deployment (Philippines)



Some PH investments (2024)



PH as host to Loss and Damage Fund



Department of Finance

At least P1 billion
(US\$16.9 million)



National Irrigation Administration

P70.2 trillion
(US\$1.19 billion)



Climate Change Commission

P94.6 million
(US\$1.6 million)



National Housing Authority

P2.68 billion
(US\$45.5 million)

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Some PH investments (2024)



National Disaster Risk Reduction and Management

For aid, relief and rehabilitation

P20.5 billion
(US\$347.8 million)

Quick Response Fund

P7.9 billion
(US\$134 million)

DA - OSEC	P	1,000,000,000
DepEd - OSEC		3,000,000,000
DOH - OSEC		500,000,000
DILG - BFP		50,000,000
DILG - PNP		50,000,000
DND - OCD		500,000,000
DPWH - OSEC		1,000,000,000
DSWD - OSEC		1,750,000,000
DOTr - PCG		75,000,000
TOTAL	P	7,925,000,000

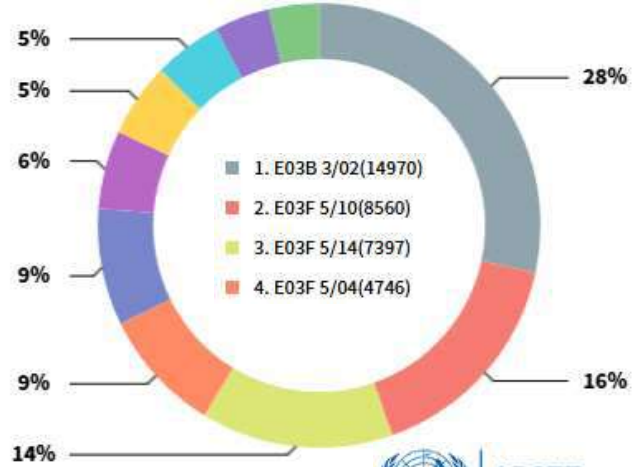
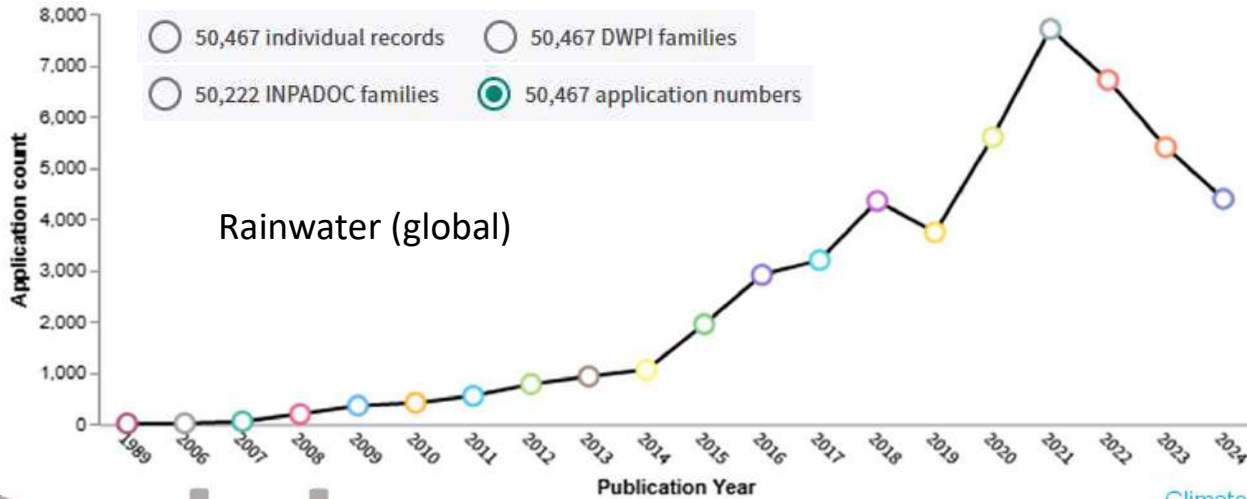
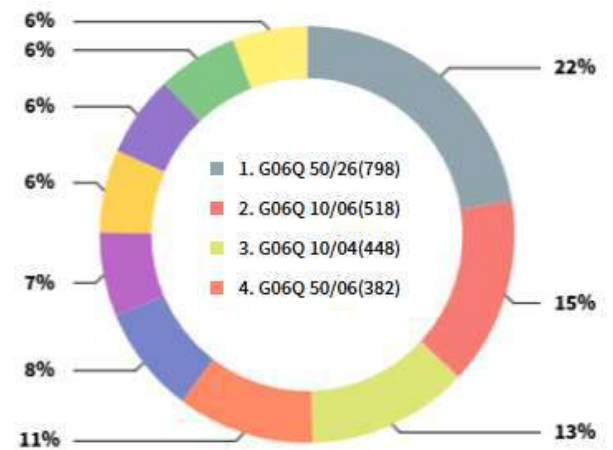
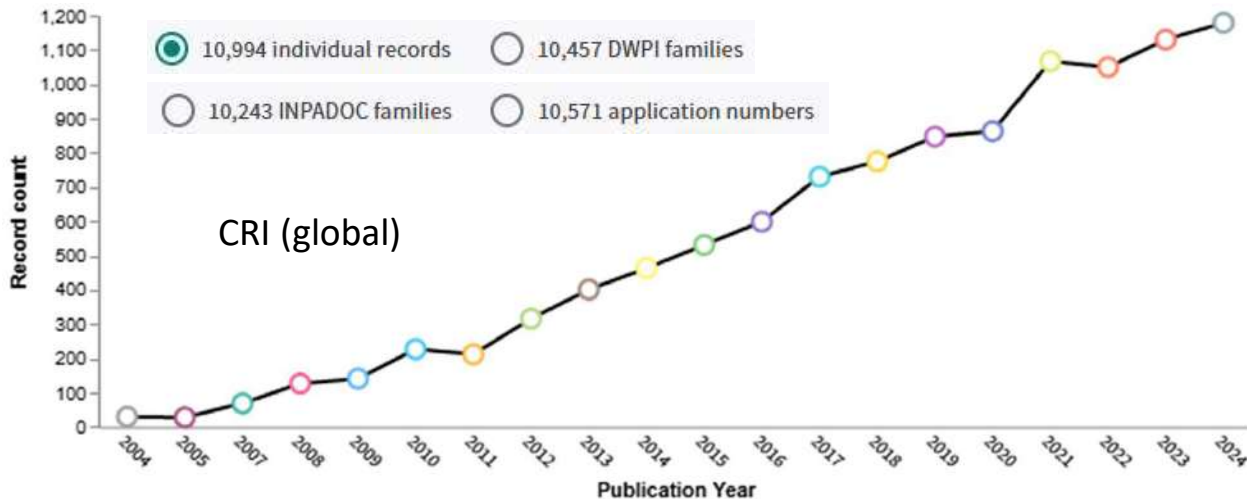
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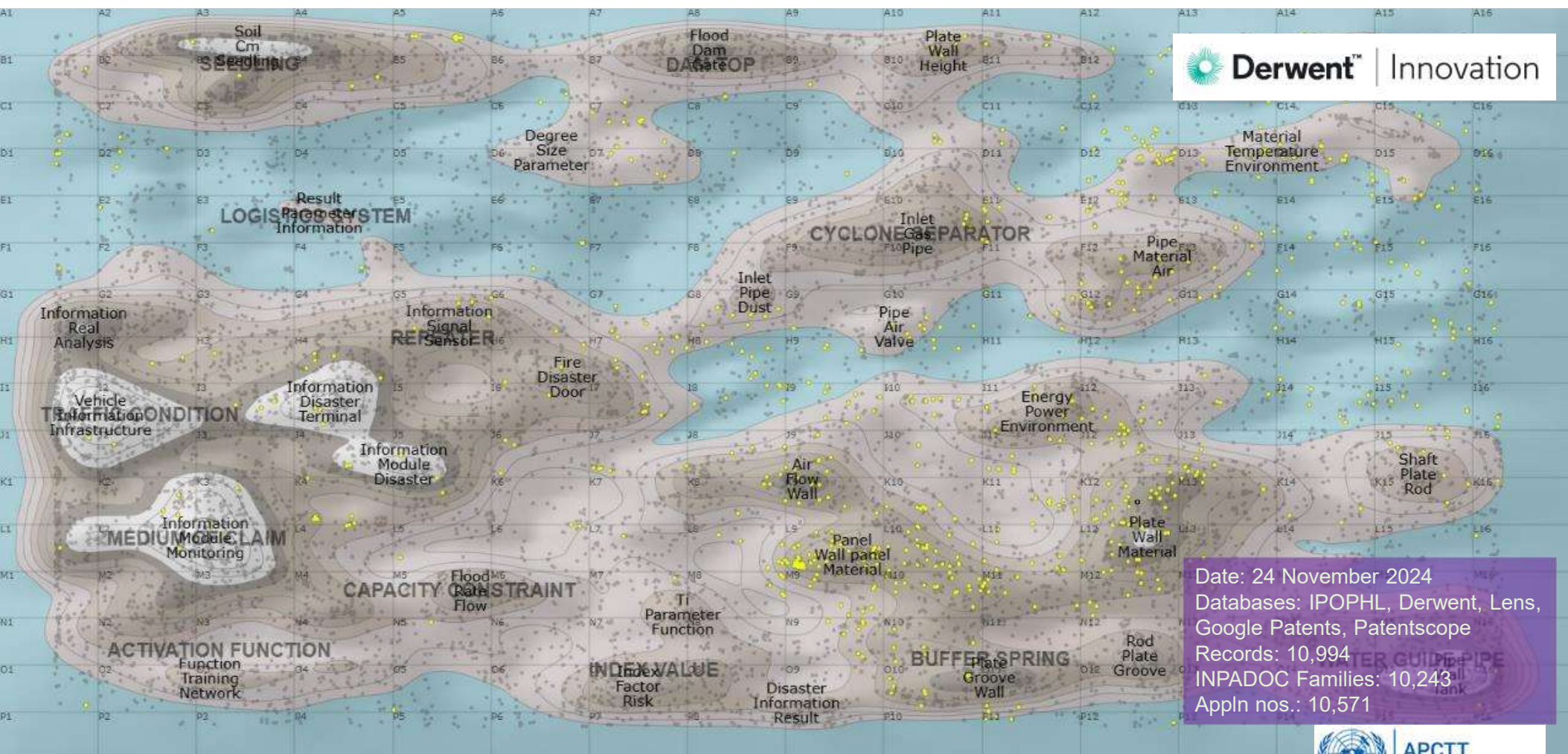




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Development, Upscaling and Deployment (Philippines)





Date: 24 November 2024
 Databases: IPOPHL, Derwent, Lens, Google Patents, Patentscope
 Records: 10,994
 INPADOC Families: 10,243
 Appln nos.: 10,571

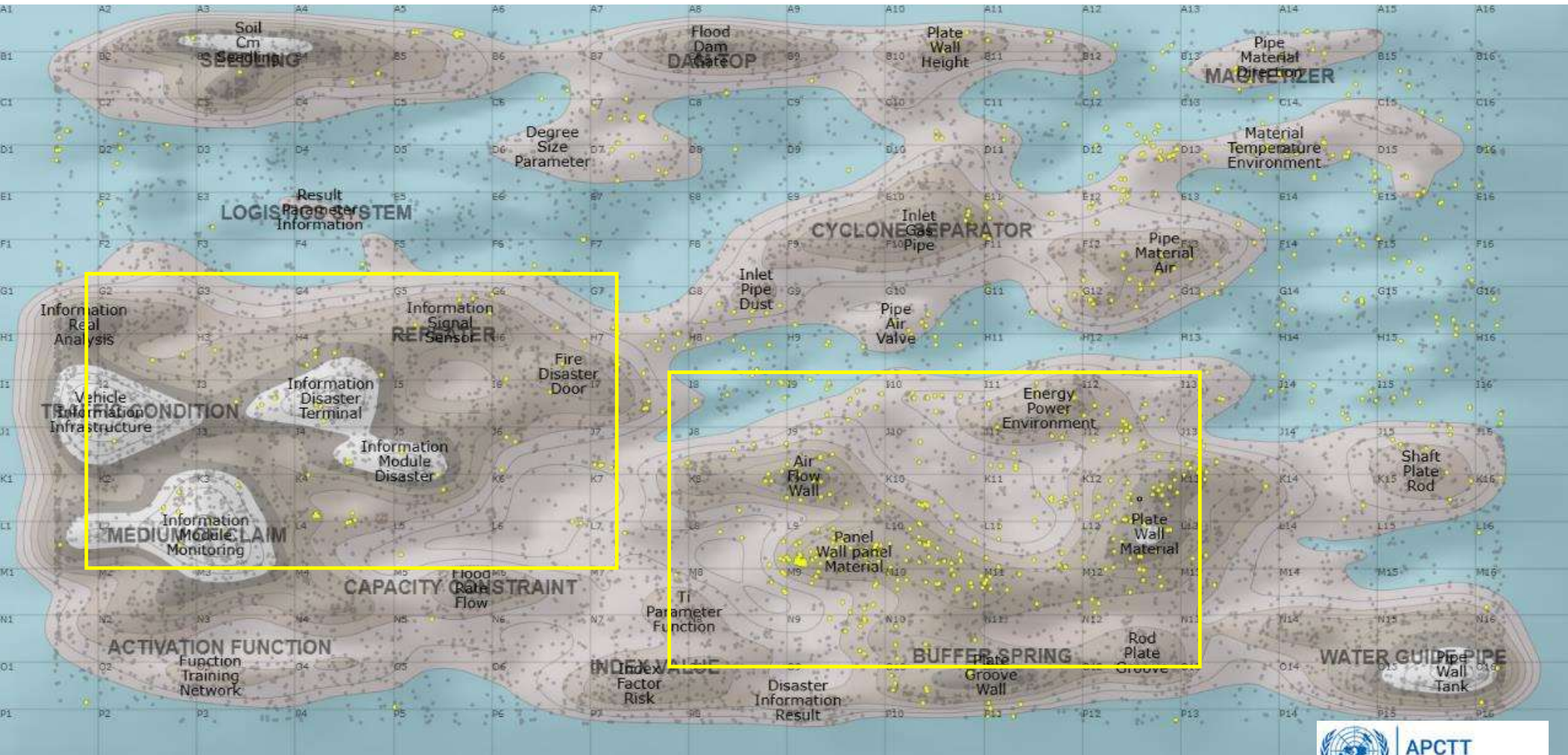
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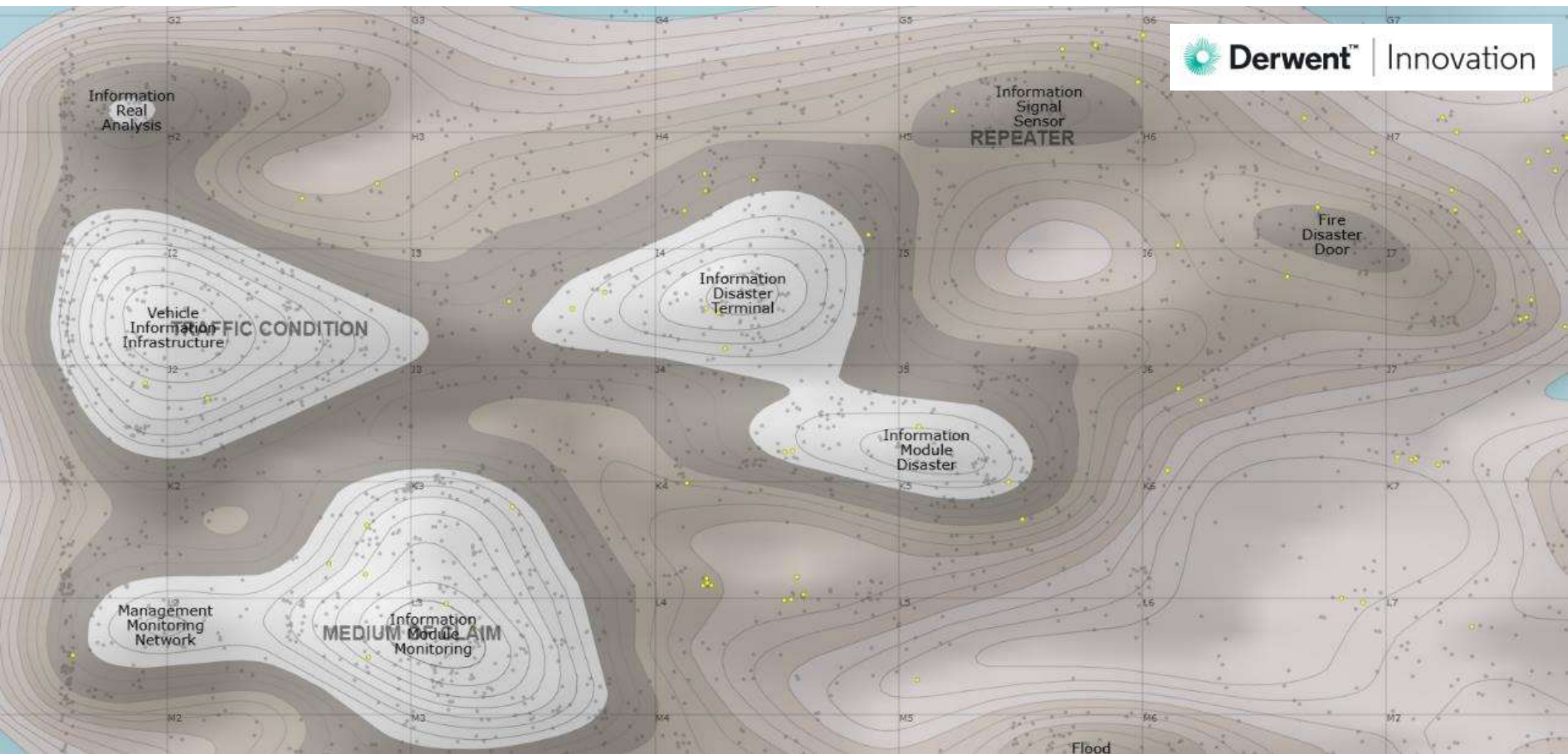
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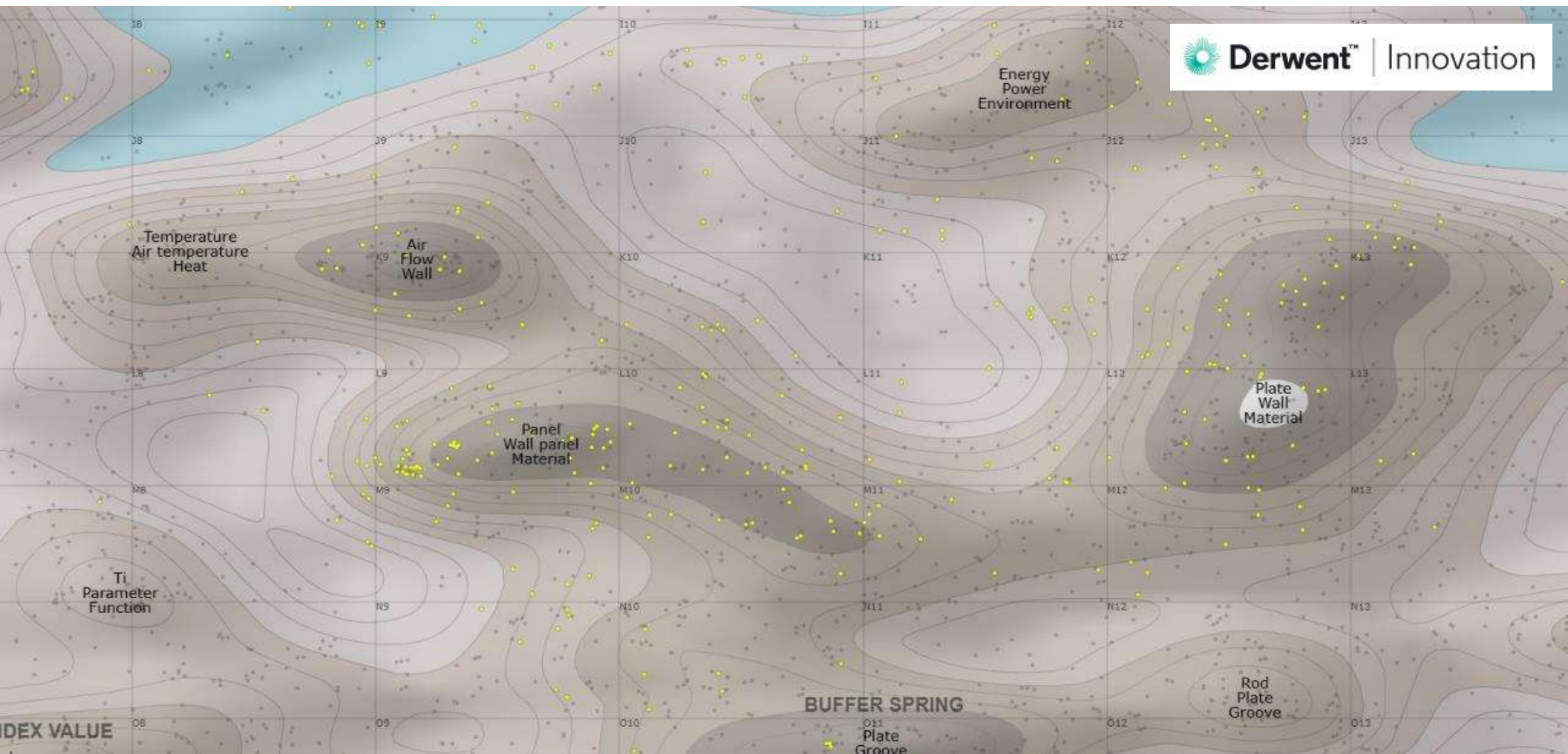
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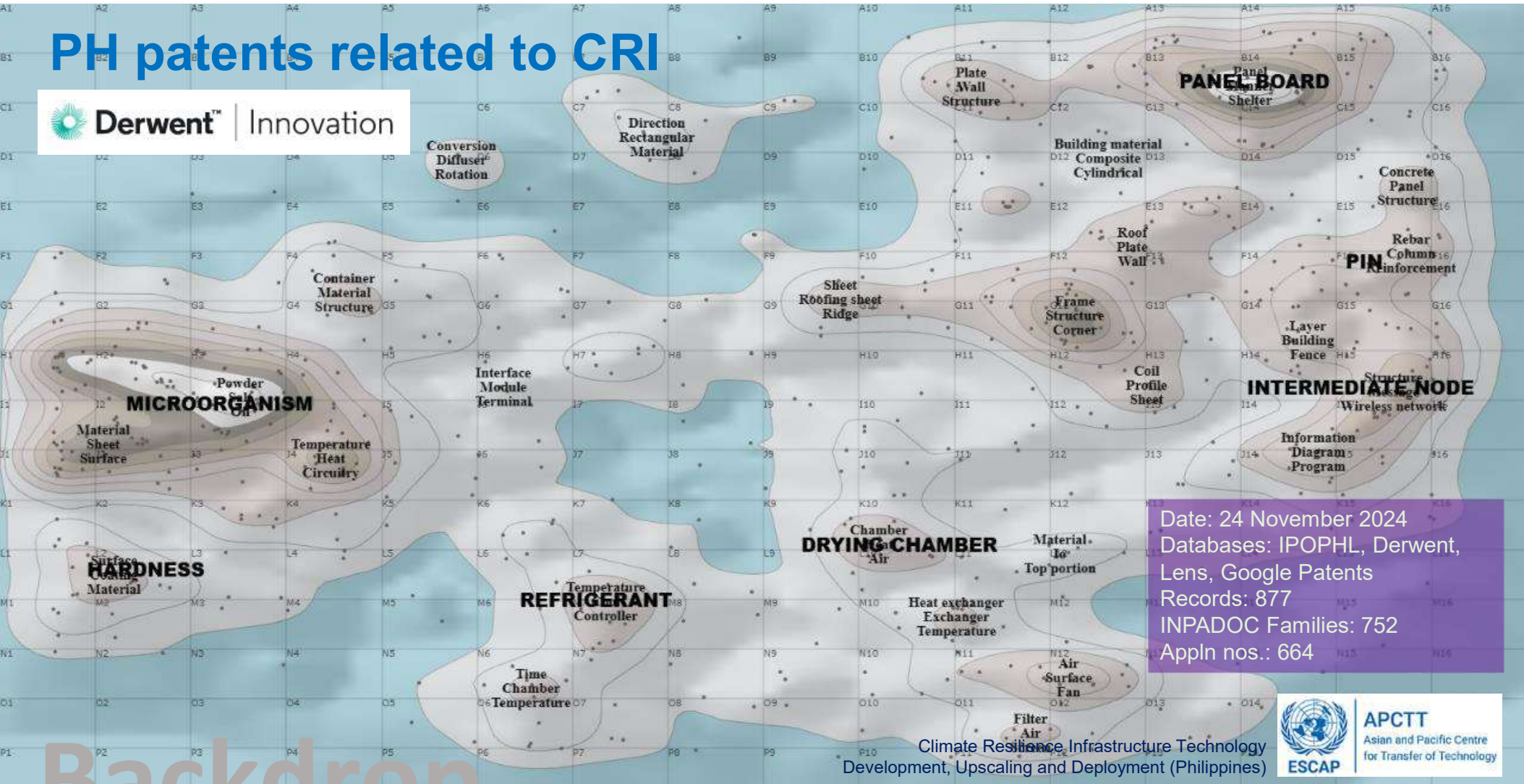
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PH patents related to CRI



Date: 24 November 2024
Databases: IPOPHL, Derwent, Lens, Google Patents
Records: 877
INPADOC Families: 752
Appln nos.: 664

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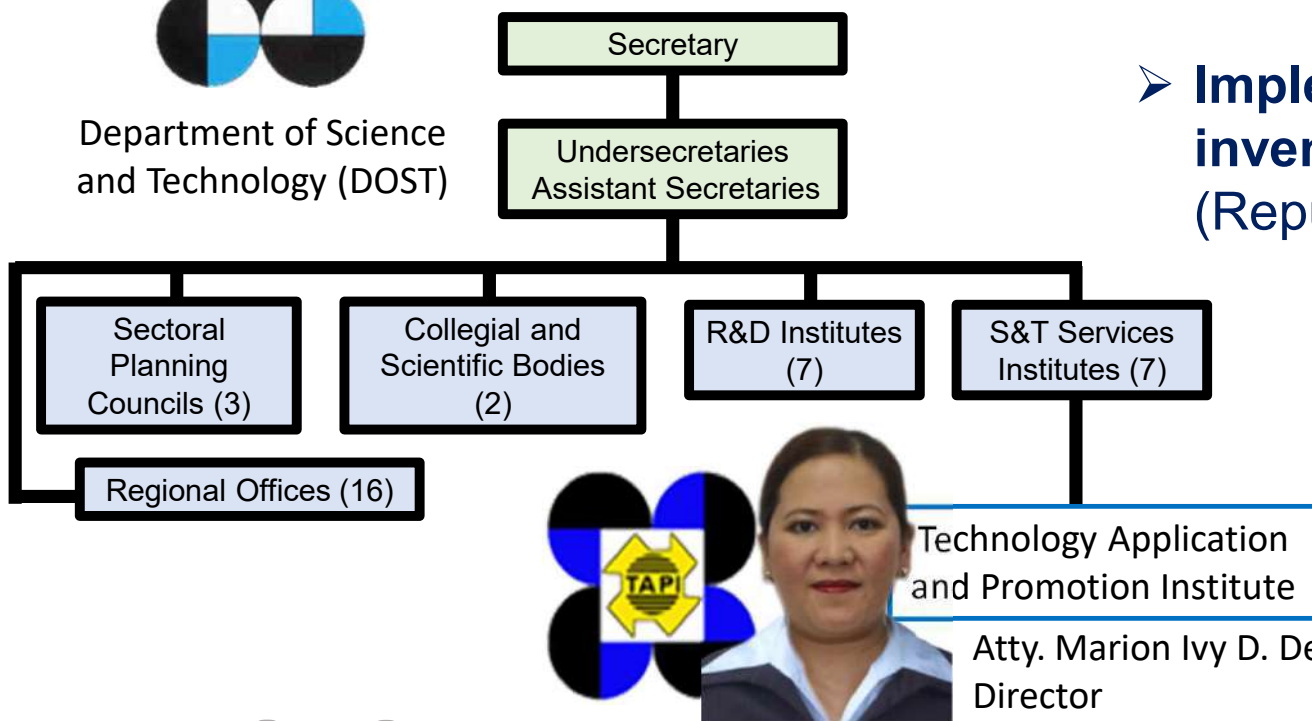
Climate Resilience, Infrastructure Technology Development, Upscaling and Deployment (Philippines)



Who we are



Department of Science and Technology (DOST)



➤ **Technology transfer arm of the DOST**
(Executive Order 128, 1987)

➤ **Implements inventors' and inventions incentives law**
(Republic Act No. 7459, 1992)

➤ **Depository institution of fairness opinion reports**
(Amended IRR, Republic Act No. 10055, 2009)



Technology Application and Promotion Institute

Atty. Marion Ivy D. Decena
Director

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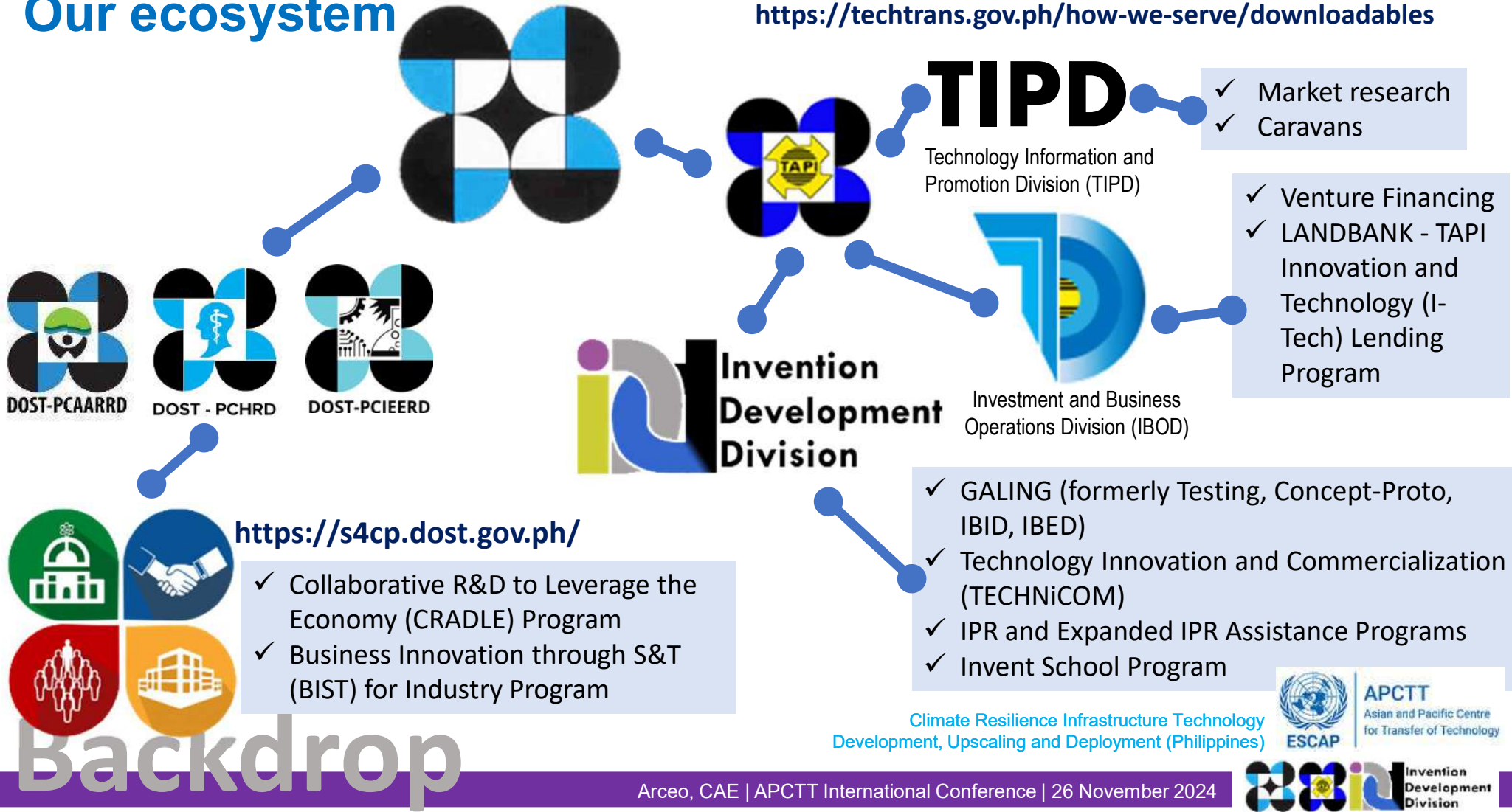
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Our ecosystem



COUNTRY'S FIRST-EVER ADVANCED FREEDOM-TO-OPERATE TRAINING ONGOING

28 June 2019

The Technology Application and Promotion Institute of the Department of Science and Technology (DOST-TAPI) conducting the first ever Advanced Freedom-to-Operate Training and presently being held at the Dusit Thani Manila, Ma 28 June 2019. The training is in collaboration with the Swedish Patent and Registration Office (PRV).

The two-day live-in training is an event being organized by the DOST through TAPI under the project entitled "Su Commercialization of 500 DOST Generated Technologies & Strengthening the Country's Intellectual Property &



<https://www.linkedin.com/pulse/certified-patent-valuation-analyst-philippines-david-wanetick/>



Certified Patent Valuation Analyst in the Philippines



David Wanetick
CEO - Davos in the Desert



September 6, 2018

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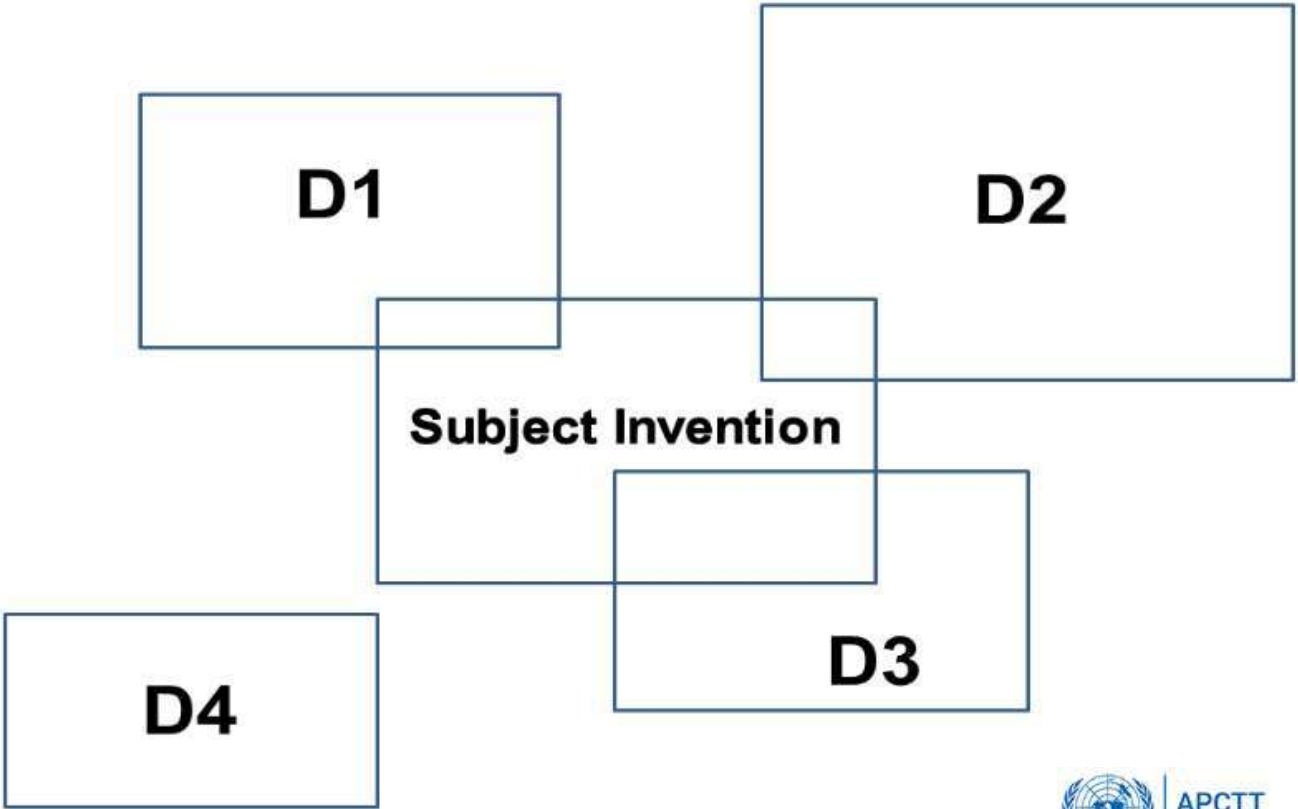
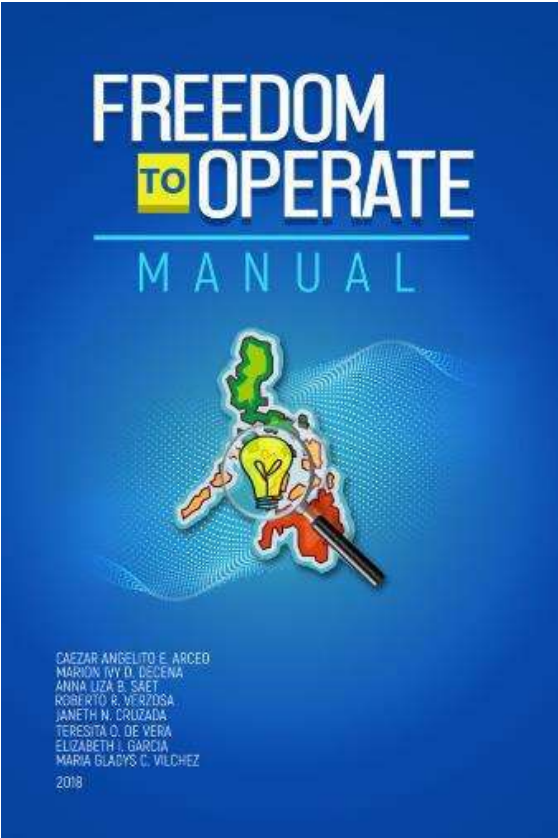
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Journey



DOST conducts royalty rates, other financial terms drill for researchers

The Department of Science and Technology (DOST) with the Technology Application and Promotion Institute (DOST-TAPI) and the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (DOST-PCAARRD) sponsored a two-day live-in training on Setting Royalty Rates and Other Financial Terms on December 5 & 6 at the B-Hotel, Alabang.

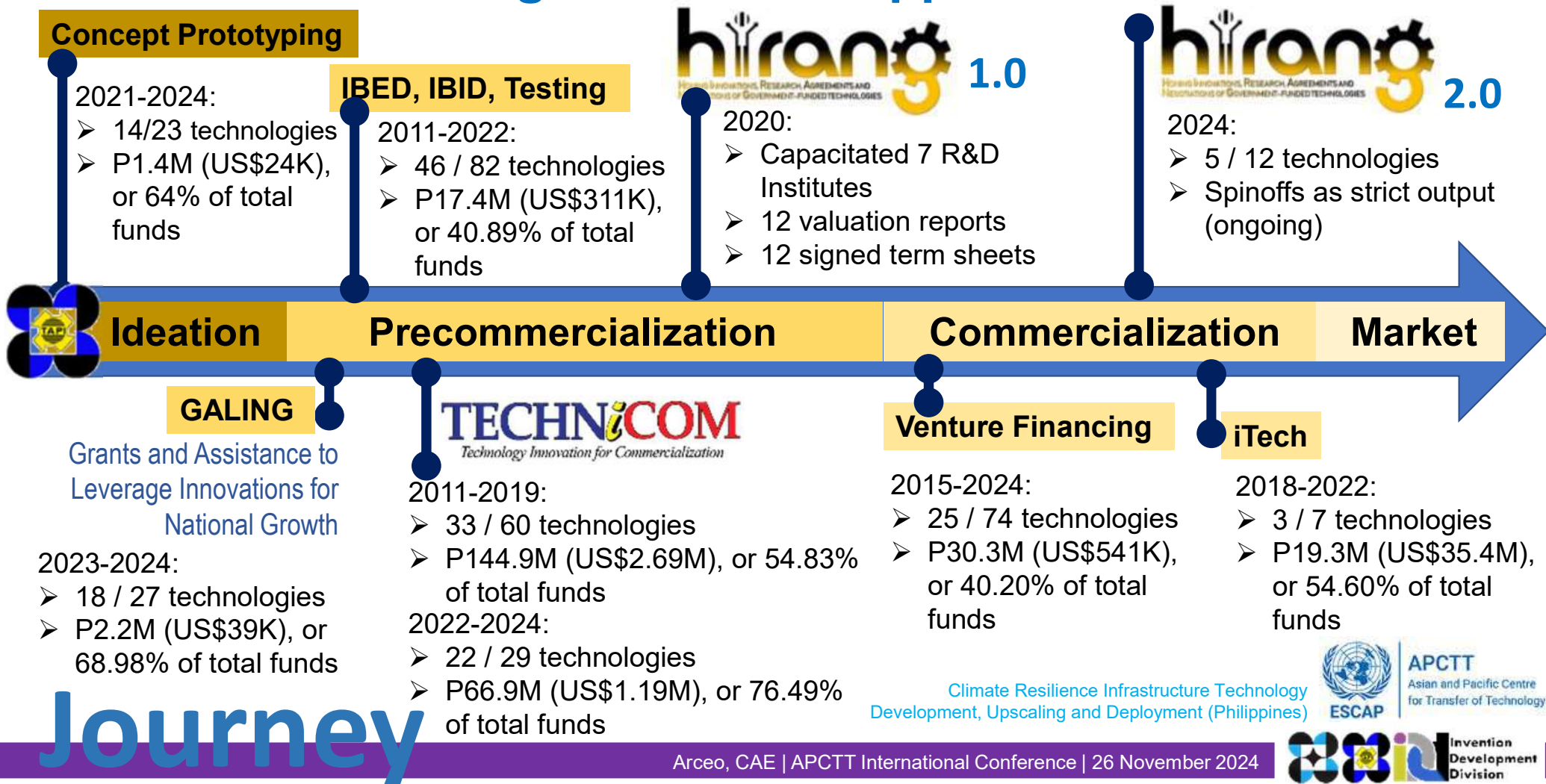


Journey

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Some PH technologies with CRI applications



Journey

Some AI patents from PH



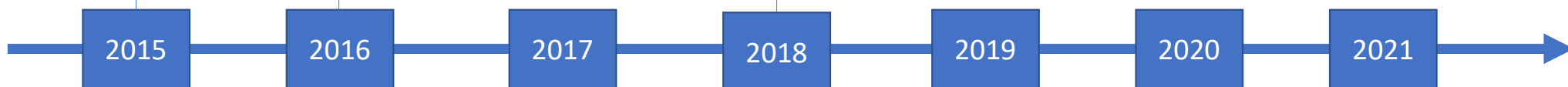
Source:
Engr. Wilfredo O. Calaguan,
Intellectual Property Office of
the Philippines

**Arceo, CAE. AI Asia Expo,08
November 2023**

Ph22015000315	Method for Predicting Physical Attributes of Milled Rice Using Image Processing Software	Philippine Rice Res Institute Philrice [Ph]
Ph22015000316	Method of Image Acquisition of Milled Rice for Image Processing	Philippine Rice Res Institute Philrice [Ph]
Ph12015000419	Method and System for Detecting and Classifying Cardiovascular Diseases Using Portable Monitoring Ecg Device	Montano Vincent D [Ph]

Ph12016000024 Drowsiness Detector Cap Tabal Keith Marlon R [Ph]

PH12018000201	Artificial Intelligence Based Service Control and Home Monitoring	Accenture Global Solutions Ltd [Ie]
PH12018000311	Adaptive Product Management Platform	Accenture Global Solutions Ltd [Ie]



PH12019000098	Virtual Services Rapid Deployment Tool	Accenture Global Solutions Ltd [Ie]
PH12019000172	Generating an Execution Script for Configuration of A System	Accenture Global Solutions Ltd [Ie]
PH12019050062	An Active Monitoring, Risk Assessment, Pilferage Detection and Fraud Mitigation Device	Spingine Corp [Ph]
PH12019050076	Enhancing Device Geolocation Using 3d Map Data	Samsung Electronics Co Ltd [Kr]
PH12019050079	Speech Enhancement of Coded Voice Calls Using Deep Neural Networks	Samsung Electronics Co Ltd [Kr]
PH12019000255	Maturity Identifier of Sugar Cane Via Image Processing and Artificial Intelligence	Tech Institute of The Philippines Manila [Ph]

PH22021050738	Real-Time Computer Vision System for Physical Distance Monitoring In Public Areas	Univ of Science and Technology of Southern Philippines [Ph]
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PH12020551461	Hair and Scalp Diagnosis and Treatment	T Biomax Sdn Bhd [My]
PH12020050067	System and Method of Feature Detection In Satellite Images Using Neural Networks	Department of Science and Tech Advanced Science and Tech Institute [Ph]
PH22020050167	System for Detecting, Monitoring and Reducing Fraud In Healthcare and Health Or Medical Insurance Programs	Smartinfo Philippines Inc [Ph]
PH22020050631	A Wireless Disinfecting Apparatus Using Ozone	Hinolán Carlos Jose G [Ph]

Journey

Development, Upscaling and Deployment (Philippines) ESCAP | for transfer of technology

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Abaca fiber tiles
Inventor: Jay F. Sanchez

▶ Grants and Assistance To Leverage Innovations For National Growth (GALING)



Some stories

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Koolgear
Inventor: Ivan Brent F. Nara


- ▶ Intellectual Property Assistance Program
- ▶ Grants and Assistance To Leverage Innovations For National Growth (GALING)
- ▶ Others

Some stories

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Foldable water tank with ceramic filter
Inventor: Eleanor M. Olegario

- ▶ Intellectual Property Assistance Program
- ▶ Grants and Assistance To Leverage Innovations For National Growth (GALING)

Some stories

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Development, Upscaling and Deployment (Philippines)





- ▶ Intellectual Property Assistance Program
- ▶ Innovation and Technology Lending Program (iTECH)
- ▶ IP Due Diligence
- ▶ Others


Construction panels
Inventor: Maresciel Yao

Some stories

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SOIL PH MAP
PROVINCE OF SAMAR
MUNICIPALITY OF PARANAS

5 5 10 km

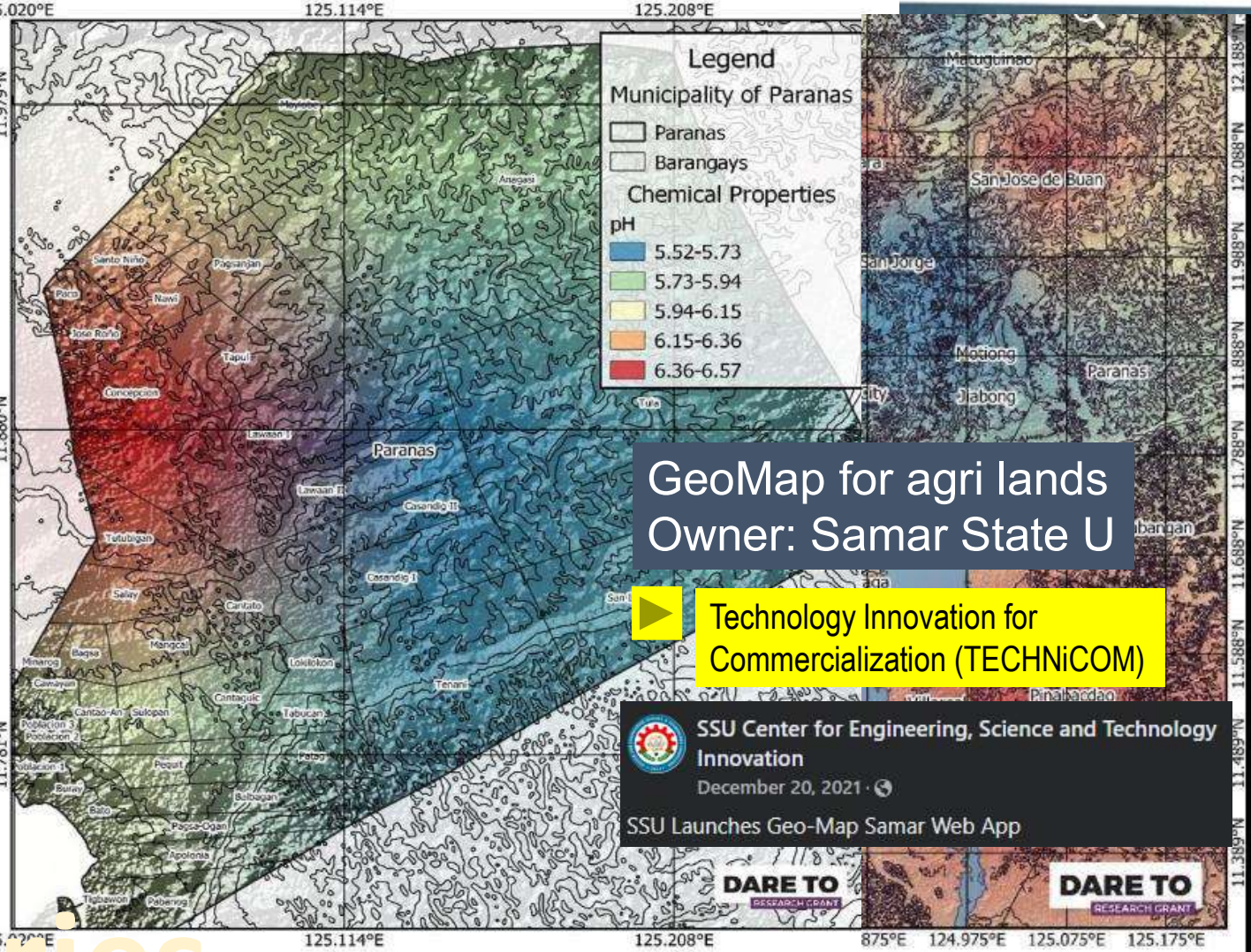



San Jose de Buan Dolores
 San Jorge Can-Avid
 Motiong Paranas
 Jiabong Taft
 Hinabangan Sulat
 San Sebastian San Julian

Geographic Coordinate System: WGS 84
Datum: WGS 84
Prime Meridian: Greenwich
Angular Unit: Degree




Developed by:
SAMAR STATE UNIVERSITY
Center for Engineering, Science and
Technology Innovation
Address: Artech Blvd, Brgy. Guindapunan,
Catbalogan City, 6700 Samar
Phone: (055) 251 2139,
Website: www.ssu.edu.ph



GeoMap for agri lands
 Owner: Samar State U

▶ Technology Innovation for
 Commercialization (TECHNiCOM)



SSU Center for Engineering, Science and Technology Innovation
 December 20, 2021

SSU Launches Geo-Map Samar Web App

Some stories

Advanced remote data acquisition
Owner: DOST-Advance Science and
Technology Institute (DOST-ASTI)



- ▶ Intellectual Property Assistance Program
- ▶ IP Due Diligence
- ▶ Others

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APCTT Visit

Vazbuilt plant, Laguna, Philippines

Eco-friendly construction materials
Inventor: Edgardo Gaddi Vazquez

- ▶ Intellectual Property Assistance Program
- ▶ Others



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 Search

Advanced features of HazardHunterPH may now be accessed by partner organizations with GeoRiskPH accounts.

- Use Current Location
- Use Coordinates
- Go to Map View

HazardHunterPH is the country's one-stop shop for hazard assessment.
Find out if a location is prone to seismic, volcanic, or hydrometeorologic hazards. Generate hazard assessment reports.
See which critical facilities and areas in the Philippines are prone to different hazards.
All hazard information used for assessment has been generated by government agencies.
Know more about HazardHunterPH [here](#).

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LOCATION TOOLS

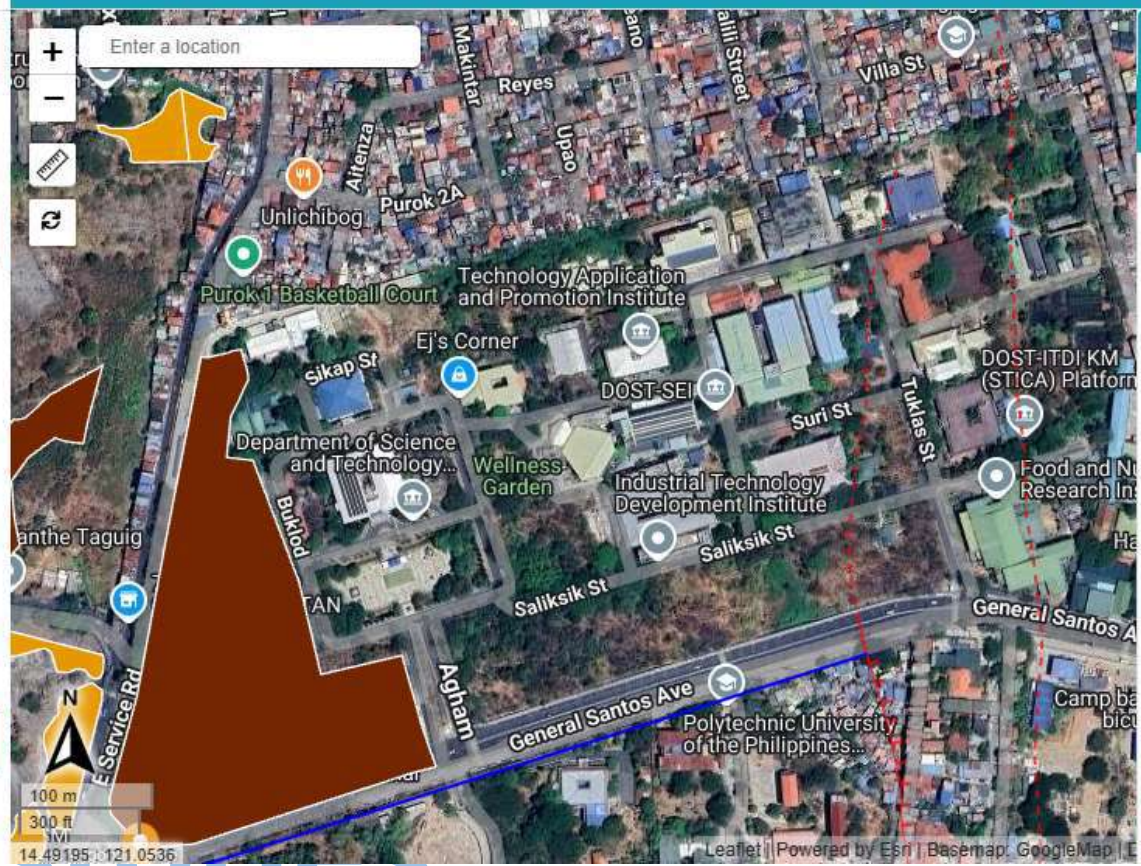
- Current Location
- Long-Lat Coordinates

DISPLAY OPTIONS

- Basemaps
- Hazards
- Exposure
- Coping Capacity
- Impact
- Advanced Layers
- Project LIGTAS

MONITORING

- Earthquake
- Volcano



Assessment Results

SEISMIC HAZARD ASSESSMENT	
Nearest Active Fault	Approximately 567 m west of the Valley Fault System: West Valley Fault
Ground Rupture	Safe
Ground Shaking	Prone; Intensity VIII
Earthquake-Induced Landslide	Safe
Liquefaction	Safe
Tsunami	Safe
VOLCANIC HAZARD ASSESSMENT	
Nearest Active Volcano	Approximately 53 km north of Taal
Nearest Potentially Active Volcano	Approximately 52.3 km east of Corregidor; No immediate volcanic hazard

[View Report with Recommendations](#)



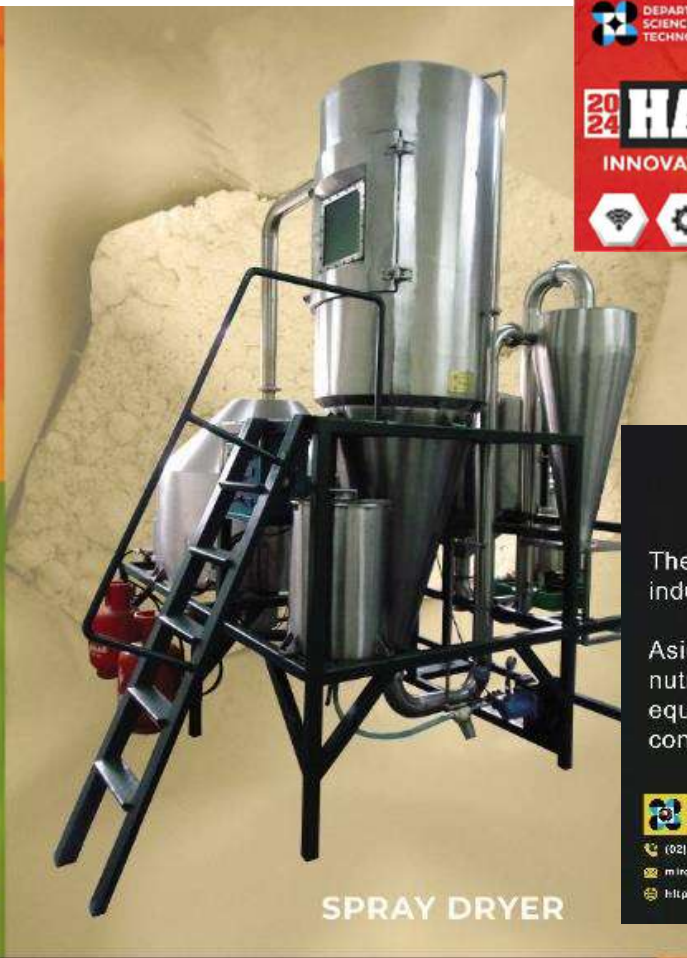
VACUUM FRYER



FREEZE DRYER



WATER RETORT



SPRAY DRYER

DEPARTMENT OF SCIENCE AND TECHNOLOGY

2024 HANDA PILIPINAS:
INNOVATIONS IN CLIMATE AND DISASTER RESILIENCE

FOOD PROCESSING EQUIPMENT

The availability of these equipment reduces the industry's dependence on imported technologies.

Aside from retaining the flavor, color, and nutritional content of processed food, these equipment prolong the shelf-life and allow more convenient transportation of products.

METALS INDUSTRY RESEARCH AND DEVELOPMENT CENTER

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 mindc@mindc.dost.gov.ph
<https://www.mindc-volcs.dost.gov.ph>

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MASID TECHNOLOGIES

The ASTI-developed Technologies for Meteorological Data Acquisition Stations for Information Dissemination (MASID) consist of locally-developed weather monitoring and warning stations collectively known as PhilSensors. These PhilSensors were designed to automatically gather on-site weather data and alert communities during approaching disasters. Collected data are recorded near-to-real time on the PhilSensors website for public use.

Among these PhilSensors are the Automated Weather Station (AWS), Automated Rain Gauge (ARG), Water Level Monitoring Station (WLMS), Water Level and Rain Monitoring Station (WRMS, also known as Tandem), Agrometeorological Station (AGROMET), Flood Early Warning Station (FEWS), Community Tsunami Alerting Station (CTAS), and Meteorological Buoy Station (Melbuoy).

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REIINDRROPS

REIINDRROPS proposes to build upon the gains from the Resilient Education Information Infrastructure for the New Normal (REIINN) by utilizing REIINN's technology demonstrators to cover four Disaster Risk Reduction and Management (DRRM) aspects: disaster prevention and mitigation, preparedness, response, rehabilitation and recovery. While REIINN is originally geared towards narrowing the digital divide, there is an opportunity for its core technologies, LokalFi and RuralCasting, to be reconfigured as interventions that addresses the need for an alternative and complementary communication channel when conventional communication infrastructures fail during calamities. REIINDRROPS is intended to be robust and can be readily deployed in times of emergencies and disasters.


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ASTI Innovation
 Development
 Division




kōōha



KOOHA

Kooha is an Android application empowering users to collect real-time participatory photo and sensor data using smartphones and other mobile devices. Named after the Filipino word "kuha," meaning capture, this tool aims to foster public participation in data collection, thereby generating a wealth of real-time data for various applications. The gathered data can then be used to create new knowledge and yield actionable insights across multiple sectors, including environmental monitoring in Disaster Risk Reduction and Management (DRRM).

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GEOTEXTILE TESTING

The DOST-PTRI Geotextile Testing Services is the Philippines' first and only geotextile testing facility meant to ensure compliance with international standards for materials used for infrastructure, buildings, roadworks, and bridges, for example. Testing is critical to ensure public safety and instill safety and confidence in government-funded public works and private construction/civil engineering projects.

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REDAS

RAPID EARTHQUAKE DAMAGE ASSESSMENTS SYSTEM



PlanSmart

Ready to Rebuild



VolcanoPH

iNFO

DYNASLOPE PROJECT

The Dynaslope Project is a research program focused on developing an early warning system for deep-seated and catastrophic landslides. Our goal is to contribute to the landslide resilience of Filipino communities.


We achieve this by building the capacities of our partner communities and local government units to develop and implement a people-centered early warning system.





HazardHunterPH™

HAZARD ASSESSMENT AT YOUR FINGERTIPS

CHANGING THE GAME IN HAZARDS ASSESSMENT AND MONITORING



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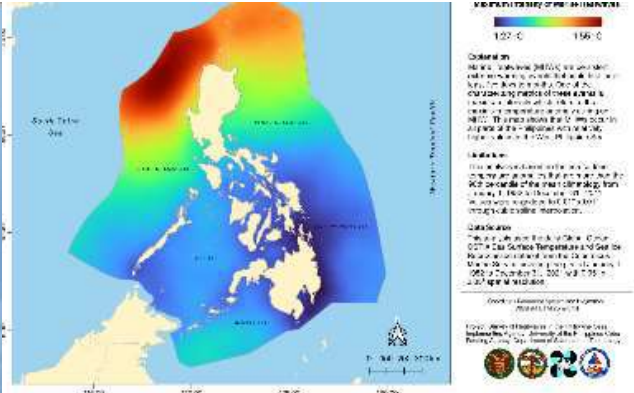


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SatREx

A Tool for Monitoring Extreme Rainfall
a web-based platform
containing near-real-time
information of
extreme rainfall
events

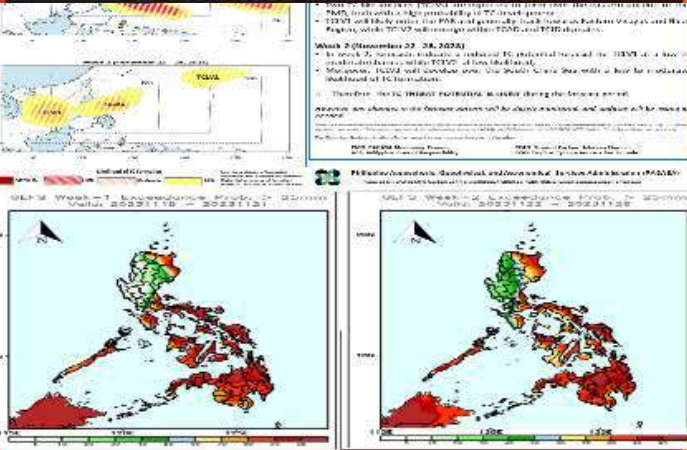


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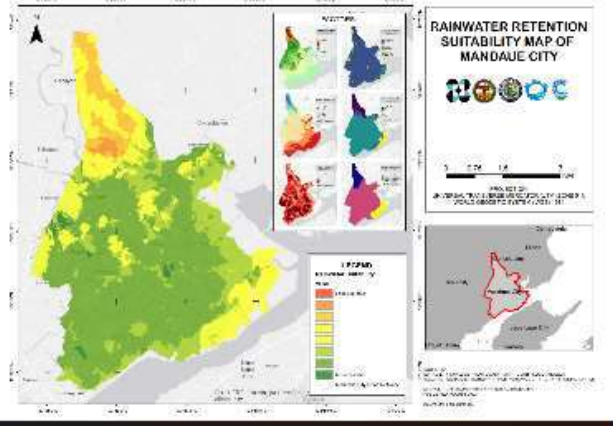
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Icons representing various climate and disaster resilience technologies.

SATELLITE-BASED MONITORING OF RAINFALL EXTREME



Survey of Heatwaves in the Philippine Seas (SHIPS)



What is impact-based forecasting?

Impact-based forecasting (IBF) provides detailed information on how hazards may impact communities. Progression from weather forecasts and warning to multi-hazard impact-based forecasts and warning services requires a coordinated multi-service delivery for many meteorological agencies.

EXAMPLES OF WARNING ISSUANCE

KEY SUCCESS FACTORS AND COLLABORATION

COMMUNICATION & COOPERATION

Weather and Climate Science for Resilient Partnerships for South-East Asia (WCSA - SEA)

IMPACT-BASED FORECASTING (AND EARLY WARNING SYSTEM)

S2S FORECAST

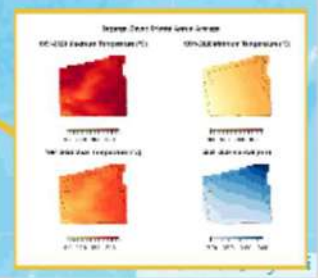
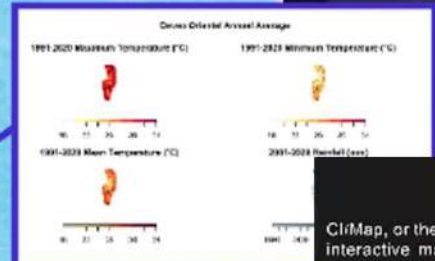
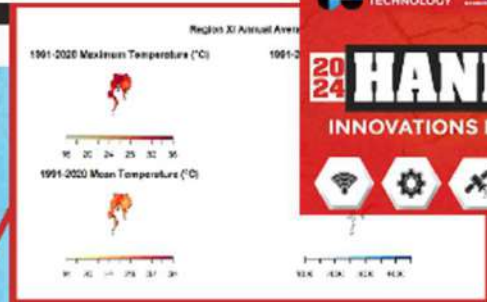
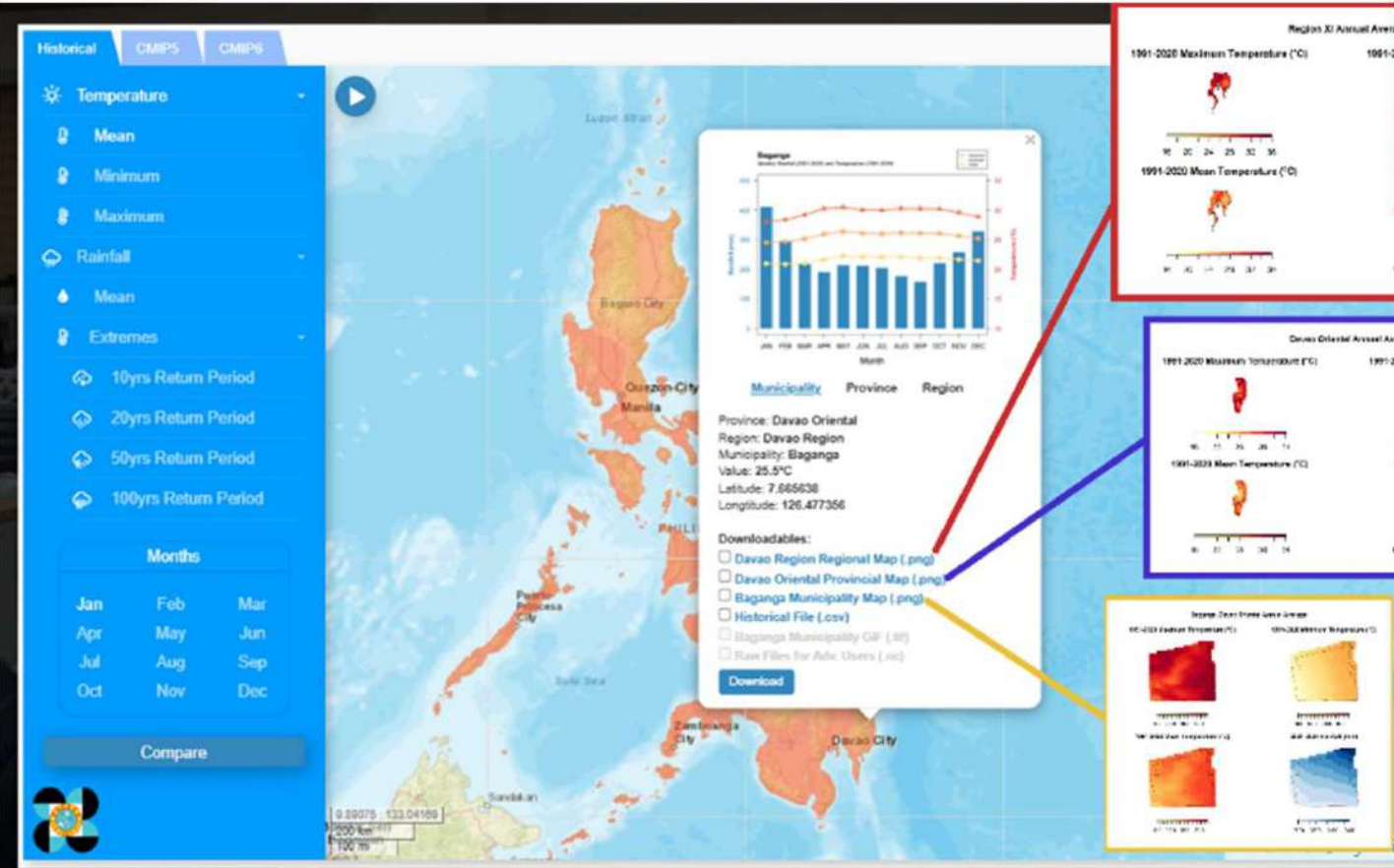
SMART-TuF Program City-Wide Urban Flood Modeling (CURB Flood) Project

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CliMap v2.0

CliMap, or the Climate Information Map is an online platform featuring an interactive map where users can explore and download the available climate data over the desired area anywhere in the Philippines. Clicking on any point on the map will reveal historical and projected changes in climate information of its municipality, province, and region.

This platform allows users to download maps of the annual average variables, historical monthly mean in a spreadsheet file, and monthly time series plots in the regional, provincial, or municipality-level from the historical data. The CMIP6-based Climate Information Risk Analysis Matrix (or CLIRAM) can also be downloaded from the climate projection data.

CliMap will primarily serve the public in providing the high-resolution observation-based gridded dataset of surface climate variables.

PHILIPPINE ATMOSPHERIC, GEOPHYSICAL AND ASTRONOMICAL SERVICES ADMINISTRATION

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LIGHTNING DETECTION SYSTEM

DOST-PAGASA introduces the new Lightning Alert System in operational use at the Ninoy Aquino International Airport to ensure the safety of airport crew and passengers, as well as aircraft and other facilities.

It monitors threatening lightning strikes from a reference point in NAIA using state-of-the-art equipment to monitor any lightning activities within the aerodrome and issue corresponding lightning alert, Yellow or Red alert.

The system sends critical information to NAA Management and Airport operations unit to aid their decision-making whether they will continue monitoring or halt airport operations during thundersorm activities to ensure the safety of ground personnel and transiting airline passengers.

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Latest Added Technologies

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List of Technologies Produced

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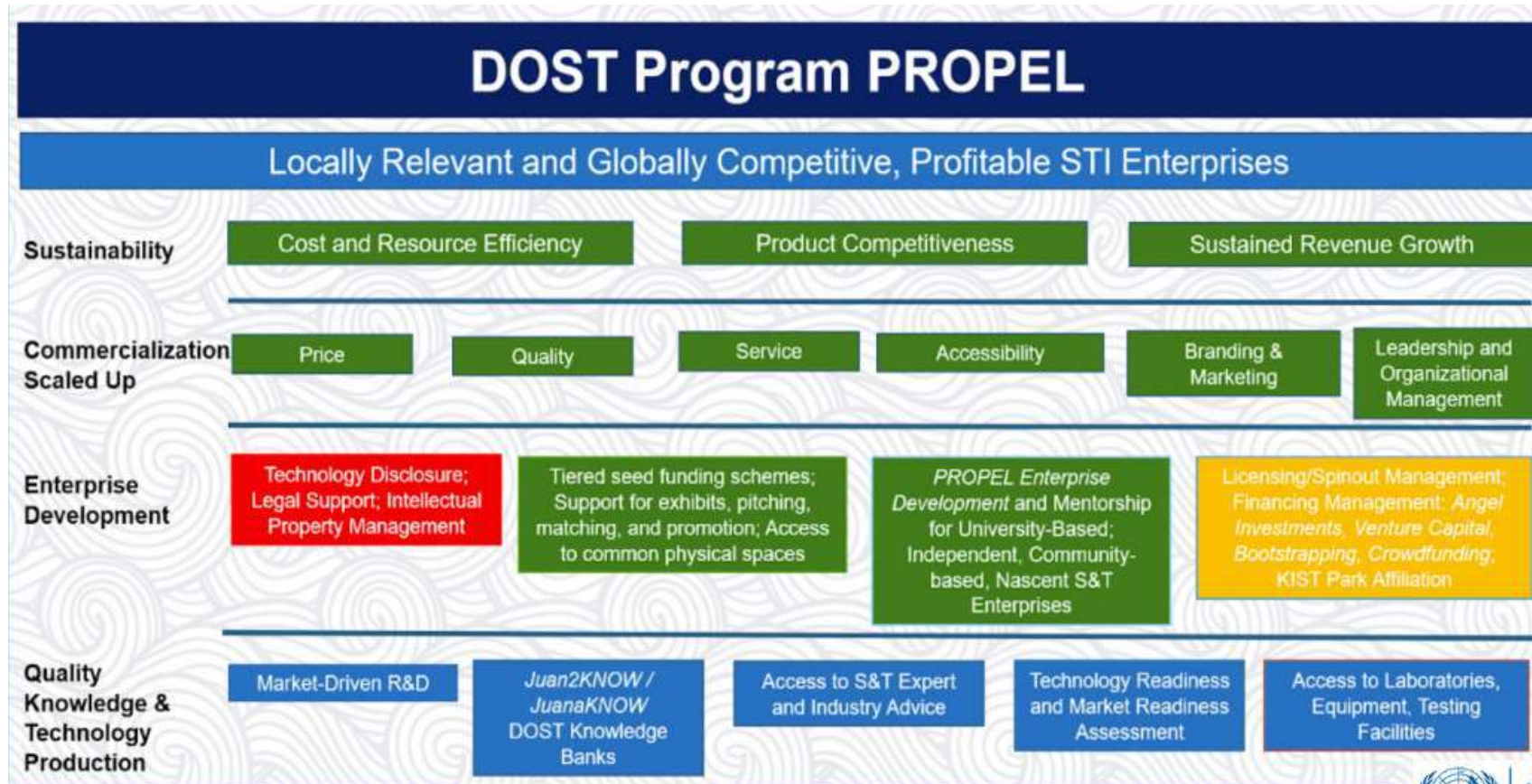


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Climate Resilience Infrastructure Technology Development, Upscaling and Deployment (Philippines)



New program



More stories

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To the beyond...

At least 60% of IP-protected technologies have CRI applications

Socio-political aspects

Procurement process (for government)

PH Technology Transfer Act

Prospects

Climate Resilience Infrastructure Technology
Development, Upscaling and Deployment (Philippines)



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Climate Resilience Infrastructure Technology Development, Upscaling and Deployment: Philippine Experiences and Prospects

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