FY 2021 PCAARRD LIST OF GRANTS-IN-AID PROGRAMS/PROJECT

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
Good Agri-Aqua Livelihood Initiatives towards National Goals (GALING) - PCAARRD Kontra CoVID-19 Program	Employing Hydroponics and Vegetable Gardening Technologies to alleviate COVID-19 Threats to Food Security in Selected Municipalities in Region IV-A	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Through the DOST- Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (DOST-PCAARRD) initiative called GALING-PCAARRD Kontra COVID-19 Program which offers technologies from various R&D outputs. It is ultimately aimed to help alleviate hunger during this COVID-19 pandemic outbreak Through the adoption of these GALING PCAARD technologies, communities will be able to address their food requirements and also offer them alternative livelihood opportunities. Recognizing the value and potential of vegetable gardening to address those concerns, an initiative to provide assistance for capacity building and enhancing productivity through technology interventions could not be overemphasized. The creation of agriculture-based small businesses will stimulate the local economy and support the community by creating jobs allowing fresh, nutritious produce to become available to communities that have never had access in the past. To model these concepts, these two implementation sites will showcase the GALING PCAARRD Program.	Products â€¢2 Technologies adopted (DOST PCAARRD Community/backyard vegetable farming technology and Hydroponics technology â€¢3 Greenhouses in BK Center and at least 2 hectare vegetable gardens in Angono Rizal maintained â€¢At least 2,400 kg vegetables produced per cycle (900 kg in BK and 1,500 kg in Angono) â€¢Profitability Analysis produced on the livelihood established on both Project sites People and Services â€¢Identify and train at least 80 beneficiaries (30 beneficiaries either as residents or community workers in the Bukid Kabataan Center who will benefit in the vegetable production and trainings to be conducted in the Center and 50 existing members of New Normal Farmers of Angono consists of senior citizens, unemployed husbands and wives with a common goal of strengthening their current vegetable production through a government program such as the DOST PCAARRD€™s GALING PCAARRD Gulayan sa Pamayanan) â€¢Conduct at least 6 training/seminars on vegetable farming modules â€¢Conduct technical advisory and consultancy â€¢Employ at least 2 staff for project monitoring and at least 3 farm-workers who will oversee the Greenhouse Operation in BK Cavite â€¢Strengthen technical and organizational capabilities of the project beneficiaries Places and Partnership â€¢Strengthen Linkages and partnerships between DOST Agencies (DOST-CALABARZON and DOST-PCAARRD), Department of Agriculture IV-A, State Universities (CLSU, URS) and stakeholders â€¢One (1) MOA forged with two project partners (Caritas Manila Inc. thru Bukid Kabataan Center in Gen. Trias, Cavite and New Normal Farmers of Angono, Rizal)	DOST-IV-A	1.Bukid Kabataan Center, Barrio del Fuego, Brgy. San Francisco, General Trias City, Cavite 2.New Normal Farmers of Angono, Hillsdale Village, Brgy. San Isidro, Angono, Rizal	16-Nov-20	31-Mar-22	ONGOING	5,000,000	500,000
Managing Cocoa Quality in the Post-Harvest Process: Biological Approaches for the Management of Mycotoxins and Storage Pests of Cacao	Proj. 1 Quick Detection of Mycotoxins in Cocoa using Nanobiosensor	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Mycotoxins such as aflatoxins and ochratoxin A can occur in cocoa as a result of fungal infection of crops. They are a major cause of economic loss in the cocoa sector. The recognition of the health hazards of mycotoxins has led to regulatory limits being set around the world, particularly in the European Union. Since the Philippines is resurrecting the cacao industry and potentially can be one of the leading exporters of cocoa worldwide, it is therefore necessary to monitor the levels of OTA and aflatoxin in cocoa beans to determine whether the cocoa beans being produced in the Philippines conform to international standards. The export value of Philippines was USD 196.42K, and the export volume was 38.54K metric ton in 2020. The Philippines should target the production of high quality beans with no to low level of mycotoxins to avail of the growing market opportunities locally and internationally. This proposed project under the program will develop innovative tool using nano-biosensor in the detection of molds causing mycotoxins for early detection and quick response to mitigate the effect of the molds on the quality of cacao beans	Project Establish the Operation of the Community-based vegetable production in Bukid Kabataan Center in Gen. Trias, Cavite YEAR 1 â€¢ 1 publication Year 2 â€¢ 3 publications â€¢ Manuals, Guide, IEC materials for onsite detection (at least 3) Patent YEAR 1 â€¢ Patent application on the nano-biosensor tool YEAR 2 â€¢ Continuation of the patent applications Product(s) YEAR 1 â€¢ Nano-biosensor diagnostic kit (prototype) YEAR 2 â€¢ Field validated prototype People Services YEAR 1 â€¢ At least 1 graduate students (MS/PhD in Chemistry YEAR 2 â€¢ Capacity (at least 25 per each locations) Agricultural technicians (at least 2 for each partner agencies	UPLB	Postharvest Facilities Other Partners/Adaptors Bureau of Plant Industries (Pest Clinic Laboratories) Municipal Agricultural Offices Farmers as identified by DA Regional Offices	1-Sep-21	31-Aug-23	ONGOING	5,671,287	1,611,456
Phase 2 Cacao Pest Management Program: Biologically-based Approaches	Project 3. Validation and Pilot Testing of the Portable Nanobiosensor for the Detection of Fungal Diseases of Cacao	KRA 3: Rapid, Inclusive and Sustained Economic Growth	validate and pilot test the developed portable nanobiosensor for the detection of fungal diseases of cacao	Product: A validate nanobiosensor for the detection of fungal diseases in cacao. Patent: A patent applied for the method of detection of fungal diseases in cacao. Publication: At least two (2) papers submitted for publication. People Services: At least five (5) students (Undergrad and graduate) Places and Partnerships: Michigan State University, De La Salle University, Bureau of Plant Industry	UPLB	Cacao and Coconut-Farmers (cacao isusuallyintercroppedwithcoconut) ï¿½ AgriculturalTechnicians ï¿½ Pest Control Companies ï¿½ Cacao Traders ï¿½ Cacao Processors/Grinders ï¿½ Cacao Food and Wellness Markets	1-Mar-20	28-Feb-22	ONGOING	5,153,328	1,055,890
Smarter Approaches to Reinvigorate Agriculture as an Industry in the Philippines (SARAI) - Phase 2	Project 1.1. Using Crop Simulation Models for Issuing Crop Advisories to Farmers	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Major crop growing province is divided into several land evaluation units (LEUs) defined in terms of more or less homogenous agro-ecological characteristics defined by climate, soil properties, topography. Each LEU has its characteristic input data on weather, soils, cultural management practices which are inputs to location-specific process-based crop models. Database for each LEU may be updated as new data and information become available. Soils data such as soil type, soil texture, soil depth, etc. for each LEU will have to be added to the database. Expected crop yield for each LEU is estimated using a crop simulation model based on variety-specific genetic coefficients and model input data for each LEU (e.g. weather data, soils data, planting date, planting density, etc.). Area planted for each LEU is determined using latest available satellite data that are freely accessible. Expected crop production for each LEU is estimated as the product of area planted and expected crop yield for the LEU. Crop production for the province is the sum of expected crop production for all LEUs within the province. Estimate(s) or recommendation(s) is provided for each LEU, and/or for the entire province. These data and information may be compared with official statistics, or recommendations or practices in the area. Methodologies and tools applied are based on the advances in science and technology such as information and communications technology, crop physiology, crop simulation, optimization, and database management. These applications may be updated as new information become available. The component protocols and procedures automated as application software (or apps) incorporated into Crop_Calculator are developed for a laptop computer, or even a smart phone. These applications are also expected to be web-based later for easy access by intended users. Component Applications: The Crop_Calculator provides a platform for incorporating or adding applications software that address specific decision-making problems or questions. It has the following component applications briefly described below: 1. Yield Gap Analysis. This involves quantifying and analyzing the crop yield gaps due to defining and limiting factors for a specific location in a major crop growing area (province); focused on rice and corn (other crops may be included). Crop yields are differentiated into potential yield, attainable yield, and actual yield. Potential yield is determined via process-based crop simulation model based on optimum conditions (i.e. without water and nutrient limitations, pests and diseases infestation). Attainable yield is	1. Crop variety-specific crop genetic coefficients for corn; 2. Validated crop simulation models for selected crops for specific locations (can be used to estimate crop yields), i.e. yield calculator; 3. Estimated crop yields (i.e. potential; nutrient-limited; water-limited yields) for specific crops in selected areas/ locations under different environmental and climatic conditions (i.e. average/ normal year; wet/ La NiÃ±a year; dry/ El NiÃ±o year); 4. Estimated cropped areas for specific crops in selected areas/ locations under different environmental and climatic conditions (i.e. average/ normal year; wet/ La NiÃ±a year; dry/ El NiÃ±o year); 5. Crop forecasting system and advisories for cereals for selected locations/ areas; 6. Location-specific crop simulation model, crop yield gap analysis; 7. Site-specific crop and water management protocols and advisories; 8. Site-specific of crop protection protocols and advisories given seasonal climate information.	UPLB	DA RFO personnel; LGU agricultural officers; Extension workers and technicians; SUC researchers; Farmer leaders; NGOs working with farmers	1-May-18	31-Dec-21	ONGOING	8,087,511	908,747
Smarter Approaches to Reinvigorate Agriculture as an Industry in the Philippines (SARAI) - Phase 2	Project 1.2. Phenology Studies, Crop Management, and Model Development for Sugarcane and Coconut	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Coconut and sugarcane are two of the most important crops in Philippine economy. Sugar exports are valued at about US$ 87.3 million while coconut continues to be the top agricultural export valued at US118 million. The Philippines ranks second to Indonesia in coconut production and is among the top 40 countries in sugar exports. From 2014 to 2016, coconut production has fluctuated with 13.8 million MT in 2016 down from 14.7 million MT in 2015. On the other hand, 2010 to 2014 saw sugarcane production in the Philippines grew at an average of 11.6% with total sugarcane production estimated at 25.03 million MT in 2014 (Philippine Statistics Authority, October 2015). In the same period, area harvested grew by 5.5%. However, the past two years saw a decline in production that may be due to decrease in production area from 423,334 to 411, 502 hectares as of June 2016 (Sugar Production Bulletin for CY 2015-2016, SRA) and low farm productivity. The country€™s average production is at 60 ton-canes per hectare, 25% lower than Thailand€™s 75 to 80. Thailand is the only ASEAN country in the five top sugar-producing countries worldwide. With too many sugar mills fighting for cane supply, mills operate at an average of 60% capacity only with lower sugar mill recovery . Recent years characterized by extreme weather events have posed challenges to the production of these two crops and hence the country€™s economy. The years ahead bring bigger challenges to the due to dwindling farm areas and unfavourable climate conditions and weather patterns. Changes in both the mean and the variability of climate, natural or man-made, pose a threat to crop production globally. Recent advances in understanding the sensitivity of crops to weather, climate and the levels of particular gases in the atmosphere indicate that the impact of these factors on crop yields and quality may be more severe than previously thought. Information on the importance to crop yields of extremes of temperature and rainfall at key stages of crop development are being generated. Crop models are required to perform simulations of climate variability and change, together with predictions of how sugarcane will respond to different climate variables. Variability of climate, such as that associated with El NiÃ±o events, has large impacts on sugarcane production. If predictions of the probability of occurrence of these extreme events can be made a season	Year 1 1. Database for upscale yield prediction models 2. Database for the development of site-specific nutrient manager 3. Database of crop phenology Year 2 1. Yield prediction model for Coconut and Sugarcane 2. Validation and field-testing of site-specific nutrient manager Year 3 1. Capacity-building to sustain the R&D activities over the medium- and long-term. 2. Site-specific nutrient manager for Coconut and Sugarcane 3. Scientific papers and other publications	UPLB	Policy and decision makers, academe (e.g. students, researchers, faculty members), private organizations, business community engaged in agro-industrial enterprises, smallholder farmers, local government units	1-May-18	31-Jan-22	ONGOING	8,557,191	908,894

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Smarter Approaches to Reinvigorate Agriculture as an Industry in the Philippines (SARAI) - Phase 2	Project 1.3. Phenology Studies, Crop Management, and Model Development for Coffee and Cacao	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project is essentially a basic research towards model development as it studies reproductive physiology which constitutes the assumptions upon which models are based. Specifically phenology will be studied which is the study of the sequence of events leading to flowering, fruit set, fruit development, and maturation and their duration under different climatic regimes. At the same time it is an applied research as it tries to do the above in actual production sites or systems so it can eventually predict fruit or product availability in different production zones. The trees will also be manipulated or trained to manageable forms to increase labor efficiency and reduce production costs. The phenological studies need to be done under different climatic types as rainfall greatly influences leaf flushing and flowering and eventual fruit development. Inputs from weather stations will be needed. The observations on phenology will be done over three years to determine if they change as the trees grow older or as they experience climatic changes. Eventually, all these phenological and environmental data will be integrated into a model.	Year 1-Year 3 1. Characterized phenological growth stages of coffee and cacao; 2. Identify the crop maturation period of coffee and cacao; 3. Determine the effects of climate change on the phenology of coffee and cacao; 4. Scientific papers and other publications 5. Support to student research 3 MS/PhD students (Horticulture) 3 BS students (Horticulture)	UPLB	Policy and decision makers, academe (e.g. students, researchers, faculty members), private organizations, business community engaged in agro-industrial enterprises, smallholder farmers, local government units	1-May-18	31-Jan-22	ONGOING	8,140,995	840,055
Smarter Approaches to Reinvigorate Agriculture as an Industry in the Philippines (SARAI) - Phase 2	Project 1.4. Phenology Studies, Crop Management, and Model Development for Banana	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will focus on the model development of two banana cultivars Lakatan and Saba (Musa acuminata and Musa balbisiana) based on empirical and existing process-based models that had been developed in other countries. It will also monitor the existing fields based on the area identified by Project 2.1 for crop phenology in major crop producing areas. Soil parameters and daily weather variables like temperature, solar radiation and rainfall will also consider in the development of growth and physiological characteristic of banana using the process-based algorithms. Data set on crop coefficients generated from SARAI phase 1 will be used as baseline profile and will increased the sample population to have a better regression model. Basic and exploratory researches will also be conducted with interventions on soil nutrient and water management. The project will also monitor the effect of changing environment on the fruit quality of crop.	Year 1 1. Database for yield prediction models 2. Database of crop phenology Year 2 1. Model development Year 3 3. Yield prediction model for Banana cultivars 4. Scientific papers and other publications	UPLB	Policy and decision makers, academe (e.g. students, researchers, faculty members), private organizations, business community engaged in agro-industrial enterprises, smallholder farmers, local government units	1-May-18	31-Oct-21	COMPLETED	10,919,994	1,234,193
Smarter Approaches to Reinvigorate Agriculture as an Industry in the Philippines (SARAI) - Phase 2	Project 1.5. Evaluation of Crop Growth Simulation Model for Soybean and Tomato	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project will closely work with Project 1.1 as soybean will be planted after corn. This consists of three study areas focusing on soybean (Glycine max). The first study will determine the crop genetic coefficients of selected local varieties of soybean using the existing crop growth simulation model. Using the crop genetic coefficients generated from the first study, the crop models will be validated using a different experimental data set. The simulated yield and observed yield will be analyzed statistically. When the crop model performance reaches the acceptable margin of error, computer-based experiments will be done to simulate the potential crop yield under a given climate scenario. The crop model will be applied to determine appropriate crop management strategies for a particular climatic condition.	1. Crop genetic coefficients of at least two local varieties of soybean using the existing crop growth simulation model 2. Validated crop growth simulation model for soybean 3. Integrated crop management protocol for specific local varieties of soybean generated from validated crop growth simulation models 4. Published scientific papers and technical papers 5. Individuals trained to use the validated crop growth models for soybean	UPLB	academe, researchers, students, farmers and farming communities, agro-industries, policy and decision makers, private organizations, local government units	1-May-18	31-Oct-21	COMPLETED	6,122,896	679,596
Smarter Approaches to Reinvigorate Agriculture as an Industry in the Philippines (SARAI) - Phase 2	Project 2.1. Community-Level SARAI-Enhanced Agricultural Monitoring System (SEAMS) and Dissemination of Crop Advisories	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The main objective of the project is to develop a community-based SEAMS. Specifically, it aims to 1. Integrate GIS/RS technology with indigenous knowledge from farming communities to: a. establish the characteristics of selected farming communities in terms of the historical and present farming systems, land use/land cover, landscape, water resources, and weather and climate; b. develop a community level monitoring, advisory and yield forecasting system; c. develop a community level DRRM; 2. Integrate the community-based SEAMS with SARAI; and 3. Train the communities and SARAI partners on the use of the community-based SEAMS	1. GIS-format database on historical and present characteristics of eight (8) farming communities in terms of farming systems, land use/land cover, landscape, water resources, and weather and climate; 2. Eight (8) community level monitoring, advisory and yield forecasting system incorporated into a GIS/RS structure; 3. Eight (8) community level DRRM incorporated into a GIS/RS structure; 4. Eight (8) community-based SEAMS integrated into the SARAI-ICMP network; and 5. Trained communities and partners on the use of CB SEAMS.	UPLB, ISU, CLSU, MinSCAT, WPU, BU, WVSU, CTU, CMU, USTP, USM, MMSU	PCAARRD Regional Consortia, Department of Agriculture, Regional Agricultural Officers, Municipal Agricultural Officers, eight (8) Farming Communities, two each for the four climatic types	1-May-18	31-Jan-22	ONGOING	61,051,546	3,068,941
Smarter Approaches to Reinvigorate Agriculture as an Industry in the Philippines (SARAI) - Phase 2	Project 2.2. Enhanced Operation and Connectivity of Automatic Weather Station and Unmanned Aerial Vehicle Units	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project aims to use, maintain and add intelligent farming instruments such as Automatic Weather Stations (AWS) and Soil Sensor Stations (SSS) and build an interconnected network of weather stations of projects under DOST-PCAARRD. The project also intends to use the Near-Infrared Reflectance (NIR) imagery together with the Unmanned Aerial Vehicle (UAV) for crop monitoring and data validation of remotely-sensed and plant-specific data. Specifically, the project aims to: 1. Continue the maintenance of the SARAI AWS and SSS units 2. Set up additional AWS and SSS units at identified sites 3. Conduct regular calibration of the AWS and soil sensors 4. Conduct capacity building activities for weather and soil data and crop monitoring among partner agencies 5. Interconnect various newly installed and non-SARAI AWS and SSS units to the existing SARAI AWS network 6. Collate all the AWS and sensor data in a common database to be used for weather forecasting 7. Provide weather information and forecasts to different program components 8. Monitor state of identified SARAI crops using RGB and multispectral imaging mounted on UAV 9. Determine vegetation index values of the identified SARAI crops to create a database of spectral crop signatures for further processing 10. Compare the NDVI values of the various SARAI crops taken by the multispectral camera mounted on UAV with satellite-derived and ground sensor values 11. Conduct validation studies on weather data generated by the SARAI AWS, Soil Sensor Stations and crop spectral images taken by UAV with PAGASA data, satellite and other ground data 12. Conduct capacity building activities by providing training in using UAV and spectral imaging for agricultural monitoring and assessment	Automatic Weather Station (AWS) - AWS set up, installation, maintenance - Capacity building on AWS/SSS among partner agencies - Interconnection of SARAI AWS, additional SARAI AWS and non-SARAI AWS under DOST-PCAARRD to SARAI network Near Infra-Red (NIR) Imagery and Unmanned Aerial Vehicle (UAV) - Capacity building on NIR/UAV among partner agencies - Crop monitoring - Validation studies - Development of protocol for nutrient and crop protection applications of UAV	UPLB	PCAARRD Regional Consortia, Department of Agriculture, Regional Agricultural Officers, Municipal Agricultural Officers, Farming Communities and Academe	1-May-18	30-Apr-22	ONGOING	11,075,929	1,340,244

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Smarter Approaches to Reinvigorate Agriculture as an Industry in the Philippines (SARAI) - Phase 2	Project 2.3. Smarter Technologies for Crop-Water Management	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project intends to integrate the outputs from the water management component (Project I) of SARAI Phase I in developing an effective and smarter crop water management. Precise monitoring of soil moisture, crop water requirement, and water stress are achieved by utilizing ground-based sensors such as automatic weather stations, soil moisture sensors, atmometers, field spectrometers, etc. Furthermore, wireless transmission of soil, crop and weather data play a crucial role in the implementation of early warning and monitoring system for crop water stress and irrigation requirement. While these state-of-the art technologies have already been demonstrated in various exhibits and SARAI-sponsored trainings, field demonstration set-ups have not been established to validate its usability and efficacy. The proposed activities for this project will include (a) field testing and calibration of capacitance-type soil moisture sensors, (b) development of web/GSM-based version of Water balance-Assisted Irrigation Scheduler (WAIS), (c) field performance evaluation and calibration of atmometers in estimating evapotranspiration, (d) generation of spectral reflectance signature of additional crops in relation to water stress, and (e) establishment of field demonstration setups for hands-on trainings and technology transfers.	↳ Wireless SARAI Soil Moisture Monitoring System ↳ Web-based version and mobile application of Water balance-Assisted Irrigation Scheduler (WAIS) ↳ Locally fabricated atmometers that are adapted for use in many fields to assist in irrigation scheduling ↳ Field Demonstration site featuring wireless soil moisture sensors, web-based decision support tool (WAIS) and automated irrigation system ↳ Spectral reflectance database of priority crops under different water stress condition ↳ Water management recommendations and advisories using web-based/mobile WAIS ↳ Conduct of Trainings and Workshops ↳ Paper presentations and publications ↳ Student involvement ↳ Patent	UPLB	Agricultural producers, field technicians, and researchers will benefit from the project. The use of sensors and irrigation decision support tool will give end users quick access to information on soil moisture status and irrigation recommendations. This will allow agricultural producers to better utilize water resources and reduce the impact of climate change and variability.	1-May-18	15-Dec-21	ONGOING	10,967,294	1,533,797
Smarter Approaches to Reinvigorate Agriculture as an Industry in the Philippines (SARAI) - Phase 2	Project 2.6. Drought and Crop Assessment and Forecasting (DCAF) Phase 2	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Just like its first phase, the 2nd phase of the Drought and Crop Assessment and Forecasting (DCAF) project will be implemented jointly by the Institute of Environmental Science and Meteorology (IESM), Philippine Atmospheric, Geophysical, and Astronomical Services Administration (PAGASA) and Bureau of Soils and Water Management (BSWM). This time it is being proposed as one project component of the SARAI Project Phase 2 in order to integrate outputs from the different project components towards enhanced agricultural drought assessment, monitoring and forecasting. Figure 1 shows how DCAF connects with other sub-project components of SARAI. The inputs to DCAF include soil moisture data, AWS data, hydrological data and other datasets in SEAMS. On the other hand, agricultural drought onset and severity, which is the primary output of DCAF, will be provided as inputs to water management models, crop management and yield projection models and assessment of its possible contribution to pest infestation and crop diseases.	1.Database of satellite-derived and ground data of temperature, rainfall, evapotranspiration and vegetation indices, and soil moisture 2.Seasonal Forecast (temperature, rainfall, evapotranspiration, soil moisture, vegetation indices) 3.Crop damage estimate 4.Agricultural Drought Assessment, Monitoring and Forecasting 5.Agricultural Drought index	UPD, DOST-PAGASA, BSWM	â€¢GASA, BSWM, agriculture officers/technicians, farmers and the general public	16-May-18	15-Aug-21	COMPLETED	20,234,350	1,057,141
Smarter Approaches to Reinvigorate Agriculture as an Industry in the Philippines (SARAI) - Phase 2	Project 3.1. Knowledge Portal and Mobile Application Development for Digital Agriculture	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The coverage of the project is threefold. First, is the continued enhancement of the SARAI knowledge portal by sustaining the real-time monitoring of weather data and continuous development of decision support systems to include additional crops and support more agricultural municipalities. Second, is to utilize the computing power of mobile technology to develop a variety of practical applications targeting farmers and farm managers as end-users. The technologies available online through the knowledge portal will be re-engineered to provide an accessible mobile application that can be delivered by province or to individual users to enable exchange and transfer of agricultural knowledge generated from research at national, regional and provincial levels. Lastly, is to develop, deploy and align the SARAI Knowledge Grid with the PCAARRD Knowledge Management System to facilitate online collaboration between and among the farmer groups, experts, extension workers and policy makers. Collaboration modules among experts will be developed and integrated with PCAARRDâ€™s Knowledge Management System to take full advantage of the decision support systems of the program. This platform will allow the various communities of practice to interact, share their experiences in adopting the technologies, exchange farming tips, and receive advisories and recommendations for best practices in farming. The same platform will be used to support access to indigenous knowledge as a heritage for new generations, and provide infrastructure to deliver timely economic and social knowledge to different stakeholders at operational, management, and decision-making levels. The performance of the enhanced system in both web and mobile platforms will be continuously assessed and improved to facilitate better collaboration and innovation. The three-pronged thrust of the project is envisioned to enable the wider diffusion of the programâ€™s developed technologies so that more target stakeholders can experience their benefits.	1. Real-time weather, climatic, and other environmental data monitoring and data storage system 2. Comprehensive data management (databases, data warehousing and knowledge bases) platform 3. Enhanced SARAI knowledge portal 4. Knowledge management system 5. Agricultural mobile applications 6. Capacity building to sustain the networking and systems development initiatives 7. Scientific papers and other publications	UPLB	Farmers, LGU Policy and Decision Makers, Agricultural Officers, Academe, Researchers, DA, PSA, Extension Workers, Students, K-12 STEAM Program	1-May-18	31-Jul-21	COMPLETED	8,454,291	1,110,644
Smarter Approaches to Reinvigorate Agriculture as an Industry in the Philippines (SARAI) - Phase 2	Project 3.2. Knowledge and Capacity Building	KRA 3: Rapid, Inclusive and Sustained Economic Growth	In line with the Capacity and Knowledge-Building on SARAI Phase I, the component aims to strengthen capacities and enhance the technical abilities of the farming communities/farmers and ensure that the outputs of SARAI will be translated into meaningful information and usable tools. Aside from the farmers and their communities, the project also aims to strengthen capacities and improve technical abilities of the persons involved in the different components of the program. In addition, different communication channels (electronic and print media) and learning frameworks will be used to transfer the information, technologies and systems to stakeholders. This also aims to update the stakeholders of the current SARAI Technologies and conduct trainings with the technologies and systems that will be developed.	1. Established links with partner SUCs, government agencies, LGUs and farming communities 2. Analyzed Training Needs Analysis for priority crops 3. Generated Information and Education Communication materials (print and electronic) 4. Developed training modules/manuals relevant to the crops and crop production system 5. Conducted capacity building activities 6. Developed training programs, and 7. Analysis of data collected from the field and validation activities	UPLB	Regional Agricultural Officers, Provincial Agricultural Officers, Municipal Agricultural Officers, Agricultural Extension Workers, Farming Communities, Academe, Private Sector	1-May-18	31-Dec-21	ONGOING	13,792,653	1,674,720
Smarter Approaches to Reinvigorate Agriculture as an Industry in the Philippines (SARAI) - Phase 2	Project 3.3. Integrating Research Results, Communication Planning, and Linking Science to Policy	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Project 3.3 envisions to bring Project SARAIâ€™s research results to the level usable, not only by academicians and researchers, but also by policy makers, daily consumers, local communities, and most importantly by farmers. This component is anchored on building partnerships to encourage the engagement of the various stakeholders and key players of the agriculture sector. First, it is tasked to maintain and expand the network of partners built during Project SARAI Phase 1; Phase 1 focused on forging collaboration among SUCs, Phase 2 will now extend its reach to linking with regional and community offices. Second, it is tasked to integrate the research results of the whole program,and craft the science into a message that can be appreciated by policy makers. The goal is to present the research results as a solid backbone for identifying policy implications, and for improving policies at a local level. Lastly, it is tasked to communicate the research results in various messages and platforms. The strategy is to come up with stakeholder-specific messages and content to meet the needs and capacities of the different groups of stakeholders. With the baseline and profiling studies done during Project SARAI Phase 1, the project component can explore the use of Information and Communication Technologies (ICTs) in promoting science for development. One example is the establishment of the community-based SARAI- Enhanced Agricultural Monitoring System (CB SEAMS); while there is a general system that operates to provide the crop advisories and crop monitoring information, the setup of CB SEAMS will vary from one community to another. CM SEAMS can be designed together with the local government units and the communities; the component can even assign community leaders that will spearhead and maintain the setup in their communities.	Systems/Networks: 1. SARAI network of partner agencies and SUCs 2. Information sharing protocols Publications/Documents: 1. Policy briefs 2. Scientific papers, books, and other publications 3. Communication materials (videos, story books, magazines, etc.) 4. ICT platforms (in collaboration with Project 3.1) 5. Communication plan	UPLB, PhilRice, PCA	PCAARRD Regional Consortia, Department of Agriculture, Regional Agricultural Officers, Municipal Agricultural Officers, Farming Communities	1-May-18	30-Apr-22	ONGOING	15,594,815	1,730,724
	Appropriate Instrumentation and Data Acquisition System for Performance Testing of Agricultural Machinery	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will focus on the design and development of appropriate instrumentation and DAQ systems for agricultural and fisheries machinery testing in the Philippines. Development of a low-cost, reliable, compliant with standards instrumentation and data acquisition system will greatly improve testing of agricultural machinery by providing an efficient way of handling data and producing reports with the data gathered.	Products: instrumentation and DAQ system; fuel consumption meter Publications: 2 conference papers, 2 journal articles Patents/copyrights: none People Services: 1 graduate and 3 undergraduate students that would take up Instrumentation courses: ABE 147, AENG 270	UPLB	Though AMTEC will be the main beneficiary of the improved instrumentation and DAQ system, the system could also be used for research and instructions (faculty, researchers and students of UPLB). Moreover, the system could be used by farmers, farmer-groups or cooperatives in the operation of postharvest equipment like dryers, silos and rice mills	1-Jun-20	31-May-22	ONGOING	4,994,150	809,140

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
	Biological Control- Based Approaches Against Major Diseases of Coffee in Region XII	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The study will provide information to the farmers and community that there could be a high potential in using indigenous endophytic microorganisms as biocontrol agents to protect coffee plants from known pests.	Products: At least 2 biopesticides and 2 Indigenous endophytic microorganisms Publication: Distribution map of major diseases in Coffee in region 12; at least 2 techno guides for biopesticides/ endophytic microorganisms for coffee prepared for the growers (translated in vernacular language); 1 publishable article preparedPatents: At least 4 patents prepared and submitted to IPO/PhilPeople and Services: At least 2 capability building conducted for the personnel; At least 2 capability building conducted for staff & farmers; At least 6 farm cooperators identified in Region 12 Places and Partnerships: At least 6 MOA/Us forged with the farm co-operators and LGUPublicatons: At least 2 techno guides for biopesticides/EMs for coffee prepared for the growers (translated in vernacular language); 1 publishable article prepared	SKSU	Coffee farmers	1-Dec-21	30-Nov-23	ONGOING	5,000,000	2,800,603
	Cost-Effective Cold Chain Systems and Product Monitoring for High Value Crops	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Cost-effective alternatives to conventional refrigerated facilities have been found to be appropriate for small-scale growers and marketers, for short-term holding or situations needing emergency storage, and/or holding of crops with low respiration rates. The project will use tomato and cabbage only as test crops but the technologies and systems to be developed can be used for other high value crops. A trader or retailer will adapt and use the prototype cold chain system as part of the testing and evaluation of the study.	Publications: Paper publications (3), oral and poster presentations on the design and testing of forced-air precooler, cold room, pallet wrap, artificial fruit, IEC Materials and operations manual; Places & Partnerships: Partnership with local growers and traders for continuous testing and evaluation of the cold chain system (e.g. weekend markets and small retailers in Los BaÃ±os); at least 2 MOUs forged People & Services: 1 MS student to work on performance evaluation of low-cost cold chain system for small-scale growers ;1 MS student to work on design and development of 3D-printed shell for artificial fruit, Trainings of farmers or end-users on the proper use of the developed technology; Collaborative R&D activities with PHTRC; Team teaching of short courses on postharvest handling, storage and systems improvement with the PHTRC Products: Prototype of mobile forced-air precooler with temperature control system (1 unit), Prototype of cold room with temperature control system (1 unit) Prototype of reusable insulated pallet wrap (3 units), Prototype of Arduino-based artificial fruit for impact stress, temperature and humidity measurement (5 units); Patents: Utility model applications for forced-air precooler, cold room, and pallet wrap, Patent application for artificial fruit; Policy: Submit draft national standard and methods of test for small cold rooms	UPLB	The prototypes to be developed are expected to benefit farmer cooperatives, traders, and retailers in the fruit and vegetable industry.	1-Aug-21	31-Jul-23	ONGOING	5,000,000	3,017,917
	Design and Development of a Solar-powered Dryer for White Copra	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The widely available energy source of solar radiation has significant potential for drying coconut meat. To promote solar drying processes to coconut farmers in rural communities, a solar-powered dryer capable of producing good quality copra is hereby proposed for development. The proposed solar-powered dryer requires no external electrical sources because the heat requirement shall be tapped from heat collected by the solar panels. It would not only minimize labor and time cost of drying but also improve copra product quality.	Year 1: 1.Established sorption and isotherm models for solar dried copra 2.CAD model of the prototype of the solar powered copra drier design Year 2: 1.One (1) prototype model of solar powered copra dryer fabricated and tested. 2.Performance data from solar dryer testing and evaluation. 3.Economic analysis on the operation of solar powered copra dryer 4.Technology manual for operation and maintenance and standard drying schedule of copra using solar dryer	PCA-ZRC	Coconut farmer organizations, copra traders and machinery fabricators	1-Nov-20	31-Oct-22	ONGOING	5,000,000	2,514,121
	Design and Development of Low-Cost Temporary Immersion Bioreactor System for Coffee Micropropagation	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will locally develop bioreactor system to speed up the production of quality coffee planting materials and increase its efficiency as well as its mortality rate.	Year 1: Optimization data (final specifications and design of the temporary immersion bioreactor) Year 2: Low-cost temporary immersion plant tissue culture bioreactor Publications â€" at least 1 article published in ISI/Scopus-indexed journal; Manual of Operations of the equipment; Coffee Somatic Embryogenesis protocol Patents/Intellectual Property â€"patent and/ or IPR of the equipment filed Products â€" 1 unit of temporary immersion bioreactor system; 3,000 plantlets People services â€" engaged at least 2 undergraduate/MS students Places and Partnerships â€" partnership with chosen fabricator established	CvSU	Tissue culturists, researchers, laboratory technicians, coffee farmers, coffee nursery owners, students, Department of Agriculture	1-Aug-21	31-Jul-23	ONGOING	5,000,000	3,487,100
	Design, Development and Optimization of an Automated Combined Mechanical Demucilager-Fermenter-Dryer for Cacao (Old Title: Design, Development and Optimization of an Automated Control Combined Mucilage Extractor-Mechanical Cacao Fermenter-Dryer)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This proposed machine continually process the fresh bean to produce dried fermented beans and incorporates the automation controls with built-in sensors in the system. Thus, this project will be undertaken to address the lack of cacao postharvest knowledge, appropriate equipment/facility for cacao postharvest process. It also addresses the reduction of the amount of heavy labor and dependence on good weather condition	2 patents (Utility model) of CCFD and cacao processing protocol filed 2 units of CCFD prototype fabricatedand 1 unit upscaled/optimized model At least 2 cacao DA technicianat least 25 cacao growers trained on cacao processing Collaboration with Cacao Growers and Cocoa Phil Cooperative	USeP	Cacao growers, cooperative and machinery fabricators	16-Jul-19	15-Jan-22	ONGOING	4,945,925	1,297,651

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	Development and Installation of an Autonomous Navigation System Platform in a Hand Tractor for Agricultural Applications	KRA 3: Rapid, Inclusive and Sustained Economic Growth	A lab-scale working prototype of the hardware system of the Autonomous Navigation System Platform was initially developed as a proof of concept and to simulate the interface of the actuators and other mobile components. The Autonomous Navigation System Platform can be installed in different agricultural mobile machines. The proponent selected the hand tractor as the test machine because of its versatility and it is widely used by our local farmers. The prototype robot can navigate through predefined waypoints and straightforward mathematical models were used to test the navigation and steering performance of the robot. Based from the initial tests conducted, a 2-meter error was evident as the robot navigates through the waypoints due to the inaccuracy of the GPS module. The accuracy of navigation is currently acceptable for delivering and carrying loads around the field (point to point navigation) but the tracking errors demonstrate it is not accurate enough for reliable in-line as in case of seed planting and harvesting. Hence, this proposal intends to further improve the autonomous navigation system platform installed in a hand tractor and fine tune test the robot in actual rice field with an aim to come up with a reliable and modular navigation platform for use in a hand tractor setup	The expected output of this project is an autonomous hand tractor navigation platform that can be installed in a hand tractor unit. The platform will allow a commercially available hand tractor to perform tillage operation autonomously or without the manual involvement of the farmer. In the course of the project, operation manual and safety guidelines for the operation of autonomous agricultural robots shall be accomplished	UST	The primary beneficiaries of this project are progressive rice farmers and farm cooperatives. Engineering students and robotics researchers from different universities can be inspired to design similar machines in different areas of agriculture. This includes young farmers that might be interested to go back to farming once they see the exciting use of technology in action. Hopefully, more young generations will be interested to study agricultural robotics for the food security and sustainability of our country	1-Sep-19	31-Aug-22	ONGOING	4,727,728	1,169,534
	Development and Pilot Testing of Hand Tractor Driven Onion Harvester	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The study aims to develop a hand tractor driven onion harvester which will be pilot-tested in actual field conditions of Ilocos Region to come up with a technically and economically feasible final prototype that could be commercialized in the local market. It would utilize existing hand tractors to power the onion harvester thus increasing its utilization as it was mainly used in land preparation and transport operations. With the harvester, onion farmers would be more productive reducing manual labor problems in the harvesting operations which could also be operated timely reducing crop losses thus increases income. The hand tractor driven-onion harvester may also be used to harvest other similar root crops like potato and peanuts given some modifications. Aside from its benefits to farmers, it could also provide opportunities for the local manufacturing industry for further business endeavors. Hence with the attachment, increased income for both the onion farmers and would-be fabricators could be expected.	2 onion harvester implement 1 Technology Patent Applied/utility model 1 Indexed Journal Publication/ 1 Operators Manual/1 technical poster 1 BSABE student assisted/ 45 farmers (15 farmers/municipality) and 6 cooperatives (cooperatives/municipality) trained on the operation of onion harvester 1 accredited fabricator and 3 Municipalities (Bantay and Sinait, Ilocos Sur and Badoc, Ilocos Norte Recommendation for the creation of PAES for onion harvester implement	DMMMSU	The target beneficiaries of the proposed project are; (a) the individual onion farmers, (b) group of farmers or cooperatives, (c) Don Mariano Marcos Memorial State University and other interested institutions, agencies, and individuals for purposes of education in instruction, research, and study tours, and (d) other stakeholders who are engaged in manufacturing and or fabrication.	1-Jul-20	30-Jun-22	ONGOING	4,684,358	1,335,281
	Development of a Detection Tool for Fungicide Resistant Isolates of Fungal Pathogens Affecting Vegetable and Fruit Crops in the Northern Philippines	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The proposed project will determine the emergence and widescale prevalence of fungicide (antifungal) resistance of fungal plant pathogens affecting vegetable and fruit crops in the Northern regions of the Philippines. These include emphasising on the emerging problems and the risks of fungicide resistance in vegetable production and how the proposed project will help alleviate the global concern on the general antimicrobial resistance due to heavy reliance to synthetic/chemicals used in agricultural management practices.	Product- Multiplex PCR-based markers; People & Services- Train at least 3 groups of beneficiaries (university-based service labs, RCPC, NCPC) Conduct at least 3 training/seminars and technical advisory on molecular diagnostic tools in plant pathology and mycology, Involve undergraduate 1 graduate student, 3 staff, >10 farmers through farmer field day activities e.g., advisory on use of fungicides; Places & Partnerships- One (1) MOA/MOU among 2 partner agencies (Benguet State University, Regional Crop Protection Centers) signed Publications: two (2) manuscripts submitted to scientific journal; Training modules for the capacity building activities, extension bulletins/infographics for the advisory systems, protocols for the technology developed, proceedings and presentations from scientific conference attended Policy: Drafted policy recommendation on the regulation of fungicide use	UPD	Vegetables and strawberry farmers, chemical industry, LGUs, Fungicide resistance action committee, NGAs: FPA, NCPC, RCPC,	1-Oct-21	30-Sep-23	ONGOING	5,000,000	3,302,036
	Development of nanofertilizer from poultry waste biogas digestate	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project is a research collaboration between the University of Mindanao and AnaâĉĆ™s Breeders Farm, Inc. (ABFI). ABFI is one of the leading integrated poultry farm producers of high-quality broiler chicken meat in the Philippines. Their scope of operation includes feed mill plant, parent stock farms, hatchery, broiler farms, dressing plant, cold storage facility, and meat processing plant. One of the problems the company is facing is the salability of their fertilizer from chicken manure. A few of the factors that affect its marketability are the undesired odor and moisture possessed by the produced fertilizer. With a production rate of 120 m3 digestate per day in their biogas reactor, the company is expected to recover 12 tons of fertilizer after 30 days of fermentation. Although the companyâĉĆ™s existing technology uses a decanter to separate the solid fertilizer, the approach was not enough to produce fertilizer with higher market value. The current technology is estimated to cost Php 20 per kg for the treatment, while the market price of the product is only at Php 2, hence, the company is suffering a significant loss, and thus, the process must be improved. Organic fertilizers such as these are cheaper than chemical fertilizers, e.g. urea which is priced at around Php 1140 per sack or Php 22.8 per kg. The use of this fertilizer will result in the increase our farmerâĉĆ™s profits through reduction of fertilizer cost and at the same time increasing crop yield. This project aims to produce a nanofertilizer which is considered a promising approach to improve crop production, thus, making it more attractive in the market. The project also aims to develop a technology	Publication: At least one (1) publication for the technology to simultaneously deodorize and produce solid and liquid nanofertilizer from biogas plant digestateâ,Ã Patent: At least one (1) patent application for the technology to simultaneously deodorize and produce solid and liquid nanofertilizer from biogas plant digestateProduct: Products (3) Solid Nanofertilizer Liquid Fertilizer Biogas plant digestate processing equipmentPeople: People Services (5) 2 Masters students and 3 undergraduate studentsâ,Ã Place: Places and Partnerships (2) Partnerships with AnaâĉĆ–â,Cs Breeders Farm Inc. and Radicor Manufacturing Inc.Policy: N/A	UM-Bolton	AnaâĉĆ–â,Cs Breeders Farm Inc. General Community Environment Academe (researchers, educators, students)	1-Dec-21	30-Nov-23	ONGOING	4,990,000	2,712,602
	Enhancing Biopesticide Efficacy of Entomopathogenic Fungi (EPF) against Citrus Rind Borer (CRB) in Calamansi and Pummelo by Myco-synthesis of Bio-Nanoparticles (Old Title:Enhancing Biopesticide Efficacy by Myco-synthesis of Bio-nanoparticles Mediated by Entomopathogenic Fungi (EPF) against Citrus Rind Borer (CRB) in Calamansi (Citrus x microcarpa) and Pomelo (Citrus maxima))	KRA 3: Rapid, Inclusive and Sustained Economic Growth	A four-year project entitled Bioefficacy Evaluation of Biopesticides Derived from Entomopathogenic Fungi Against Rind Borer and Twig Blight Disease of Citrusâ€ developed biopesticides derived from EPF against CRB and found effective both in laboratory and in field condition. In order to enhance more of its efficiency and efficacy of formulated fungal derived from EPF, other techniques will be harnessed that will improve stability and biological activity of the products. The project aims to develop nano-biopesticides (utilizing nanoparticles mediated by fungi- the fourth generation pesticide) which have higher bio-efficacy/efficiency and highly specific to a target pest. Application of nanotechnology in developing biopesticides now days is one of the most potential techniques with better efficacy. In fact, it gives 20% higher efficiency compared to other forms of biopesticides. In recent years, the use of nanomaterials has been considered as an alternative solution to control plant pests including insects, fungi and weeds. Several nanomaterials are used as antimicrobial agents in which several nanoparticles such as silver nanomaterials are in great interest. Many nanoparticles (Ag, Fe, Cu, Si, Al, Zn, ZnO, TiO2, CaO2, Al2O3 and carbon nanotubes) have been reported to have some adverse effects on plant growth apart from the antimicrobial properties. This technology uses nano-sacale carriers will react to fungal biomolecules. Fungal biomolecules could either be in the form of protein, toxin, enzymes (cell wall degrading enzymes), secondary metabolites and other forms of amino acids. When these molecules react with metal ions forms thin film of bio-nanoparticles. Hence, this project was conceptualized. The project aims to enhance biopesticide efficacy by harnessing myco-synthesis of bio-nanoparticle mediated by EPF against CRB in Calamansi and Pomelo. Studies on compatibility of the two Philippine isolates of EPF on the biosynthesis of AgNO3 and compare the two methods of biosynthesis of EPF-AgNPs using intracellular and extracellular routes; to optimize myco- synthesis of EPF-AgNPs production and formulation; to document structural pathogenesis of EPF-AgNPs; and to test bio-efficacy of myco-synthesized EPF-AgNPs against CRB under in-vitro and in-vivo/field trial condition.	Publication 2 scientific papers to be published in ISI journal Patents 2 utility model for mass production of EPF-AgNPs, drafting of Patent application harnessing myco-synthesized EPF against CRB Products 1 Bottled product of organic-based bio-nanoparticle in the form of EPF-AgNPs People Services 2 undergraduate students and 5 trained personnel (NVSU), 1 lab assistant from NVES of DA-Region 2, 30 trained farmers on field application of EPF-AgNPs Places and Partnership Municipal Agriculture Office, Aurora, Isabela, Calamansi Growers Association, Aurora, Isabela Policy Promotion on the use of EPF-AgNPs	NVSU	â€œRFOs most especially the Regional Crop Pest management Centers (RCPMCâ€™s) â€œResearchers and agricultural scientists â€œProfessor and students â€œCitrus growers and consumers	1-Aug-21	31-Jul-24	ONGOING	10,348,034	5,382,678

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
	Extraction of Phytohormones from Waste Coconut Water using Biochar Derived from Agricultural Residues	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Coconut (Cocos nucifera linn.) is a key agricultural crop of the Philippines besides rice, corn and sugarcane. In 2013, coconut production in the Philippines yielded 15.3 billion coconuts (Bureau of Agricultural Statistics, 2014), making the country the second top producer of coconut and the top exporter of coconut products worldwide. Coconut has been the major trade item of the Philippines, with 902,009 metric tons of coconut oil exported during the first three quarters of 2013 that resulted in $538.31 M income for the first half of the year (Coconut Industry Profile, Valencia, 2013). Unfortunately, the extraction process to produce coconut oil from dried coconut meat (copra) generates a huge volume of wastes that includes coconut husks, shells and coconut water (Philippine Coconut Authority [PCA], 2005). In particular, waste coconut water poses deleterious effects in the environment due to its high biological oxygen demand (BOD), and low pH value, resulting to fish kills, bad odors, and spoiled natural resources. However, no documented environmental problems due to untreated water discharge are available. The treatment necessary to reduce BOD of waste coconut water to acceptable levels before they can be discharged into the environment is much too costly (Asian Productivity Organization, 2006). The highly acidic pH of coconut water prevents it from being used as an irrigation water to rice paddies. Therefore, many coconut oil industries release their waste untreated, polluting the environment with unpleasant odor, kills aquatic life, and spoils soil and plants. This was a major concern of Peter Paul Philippines Corporation (PPPC) in Candelaria, Quezon, one of the largest desiccated coconut firms in the Philippines generating 80,000 liters a day of coconut water. In 1993, PPPC channeled its waste coconut water to Chia Meei plant in Taiwan for concentrating, freezing and final processing of coconut water as a commercial drink. Alternatively, a small number of industries have used waste coconut water to yield value-added products such as vinegar, nata de coco and wine (lambanog). However, many of these products are already available at an excess market supply, and therefore, are gaining smaller revenues. In this regard, other resource-recovery approaches to reduce pollution loads from coconut oil industry, and at the same time boost the economic returns of waste coconut water, are needed. Some excellent value-added products that can be recovered from coconut processing wastewater, but have not been fully realized, are plant hormones or â€œphytohormonesâ€. Phytohormones are plant growth regulators that play essential roles throughout the different stages of plant growth, from seed germination to tissue development, and to flowering. Owing to their growth- promoting activity, these biochemicals have been correlated to improved levels of harvest (Fu et al., 2011). Plants synthesise hormones at very low concentrations, and other plants are genetically deficient in one or two of them. Hence, plant propagation via tissue culture is very common wherein hormones are added to promote seed germination, influence growth and cell differentiation. The concentration of hormones required for plant responses is from 1-10 mM. Several researches identified and quantified phytohormones in coconut water, namely auxins, gibberellins, abscisic acid cytokinins (kinetin and zeatin), benzyl aminopurine and indole-3-butyric acid (Ge, et al, 2004, 2005, 2006, 2007, 2008).	Publication 1-submitted publication on optimized biochar production and phytohormone extraction from waste coconut water 1- submitted publication on pre-scale up studies for phytohormone extraction from waste coconut water Products 1-Activated biochar for phytohormone extraction from waste coconut water 1-Phytohormone product extracted from waste coconut water People 1 PCAARRD GREAT Scholar- MS Chemical Engineering 3 Undergraduate BS Chemical Engineering 1 Undergraduate BS Chemistry Patent 1-Utility Model filed for extraction of phytohormone extraction 1-patent filed for Activated biochar for phytohormone extraction from waste coconut water 1-patent filed for Phytohormone product extracted from waste coconut water Upgraded laboratory that will be the front-runner in bioenergy, waste utilization and materials innovation research.	UPLB	Coconut farmers Coconut processors Cut flower industry	1-Jan-20	31-Dec-22	ONGOING	22,970,636	4,168,402
	Formulation of a Biopesticide and its Efficacy in Controlling Armyworm (Spodoptera exigua)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project aims to formulate a biopesticide that can be used as an alternative to synthetic pesticides in the control of armyworm (Spodoptera exigua). This alternative pesticide will be called nanoparticle-enhanced biopesticides (NPEB).Â Â from plant extracts and metallic oxide nanoparticles. Botanical plants, extraction methods, and solvents will be assessed.Â Â Evaluation of the different plant extracts with bioactivity against armyworm will be the initial step in the formulation process.Â Â The mechanism of action of these plant extracts to armyworm will be determined through the expression of the phenoloxidase (PO) gene.Â Â The plant extract with the highest activity against armyworm will be utilized in the synthesis of metal (Cu, Ag, Zn) oxide nanoparticles.Â Â This process of producing nanoparticles is called the bioreduction of the metal ions into metal/metal oxide nanoparticles.Â Â The parameters such as volume ratio of extract and metal salt solution, pH, and temperature will be optimized using Response Surface Methodology.Â Â The optimization process will be monitored via UV-Vis spectrophotometry by measuring the Surface Plasmon Resonance (SPR) of the nanoparticles. Efficacy tests of the different formulations (single or combinations of plant extracts) in comparison with a commercial insecticide will be conducted.Â Â The mechanism of action of the different formulations will be determined through the phenoloxidase gene of the armyworm. The measured indicator of immune responses can be analyzed in the activity of the PO hemocyte. Therefore, one of the aims of this research is to analyze the effect of the formulated biopesticide on the PO expression before and after the treatment in different periods. Plant growth and yield and the economic benefit of using the NPEB against armyworm will be determined.	Publication: Objectives Outputs 6Ps and 2 Is Year 1 Year2 To formulate nanoparticle-enhanced biopesticides using plant extracts and metallic/metallic oxide nanoparticles; Â Â	CLSU	The specific beneficiaries of the project are the more than 4,000 onion farmers in 15 towns of Nueva Ecija who were affected during the outbreak of onion armyworms.Â Â Onion farmers in the Ilocos Region and Cagayan Valley. If this nanoparticle-enhanced biopesticide can control onion armyworms, then the onion industry, in general, will benefit from the results of the project.Â Â It is expected that the results of the project may be applied in the production of other crops identified to be host plants of armyworms.	1-Dec-21	30-Nov-23	ONGOING	5,000,000	2,813,790
	Near-realtime Monitoring of Banana Nutritional Status and Yield Forecasting Using Airborne Multispectral Imaging	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project intends to address nutrient management issues of cavendish bananas through the introduction of IoT-based multispectral nutrient sensing technology. This will be done by detecting shortages in macro elements requirements of cavendish bananas by analyzing fluorescence, reflectance and transmittance. This project will specifically evaluate the use of multispectral sensing for identify shortages of macronutrients (N, P, K) in the plant nutrition management of cavendish bananas. In addition, it will also look developing predictive models for determining the future fertilizer requirement and develop a nutrient management decision system for the banana industry. This research will use an Unmanned Aerial Vehicle (UAV) to remotely sense nutrient shortages and will utilize multispectral camera with bands capable of sensing near-infrared spectrum.	Publication: One (1) Publication on the Near-realtime Monitoring of Banana Nutritional Status and Yield Forecasting using Airborne Multispectral Imaging Patents/IP: One (1) patent Near-realtime Monitoring of Banana Nutritional Status and Yield Forecasting Products: One (1) Mobile application for Monitoring of Banana Nutritional Status and Yield Forecasting One (1) web based Expert Management System People Services: 1 industry players and one Cooperative leverage in Banana nutrition management Partnership: Three (3) Institutional partners like Hijo Resources Corporation, one (1) banana cooperative, LGU/PAO of Tagum Policy: 1 organizational policy on the protocols on plant nutrition management Expected Impacts (2is) Social Impact â€“ leverage banana industry competitiveness, thus, promoting S & T among its workers. Economic Impact â€“ Yield increase by 20% and reduce fertilizer cost by 25%	USeP	Hijo Resources Corporation Banana smallholders	21-Nov-21	31-Oct-23	ONGOING	5,000,000	2,994,998
	Pilot Testing of a Local Riding-type Rice Transplanter (Phase II)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	PhilRice has developed a local riding-type transplanter under the project, â€œDesign and Development of a Local Riding â€“type Transplanter â€ with funding from PCAARRD in 2016. Series of field tests were conducted in Nueva Ecija during the first pilot testing conducted in 2018 and necessary modifications were incorporated in the design that improved the machineâ€™s performance. The machine can transplant 2 ha/day, transplants 24â€“5 seedlings per hill at 24â€“6 cm planting depth, with 12â€“18 cm hill spacing, and 30 cm fixed row spacing. The machine had an average missing hills of 9.27% which passed the PAES standard with 2%±10% missing hill and uniform seedling distance and placement requirement. There is a need to conduct the piloting activity to several pilot areas under different technical, economic, social geographical and environmental conditions to determine the acceptability of the technology. During the piloting stage, the prototype would be subjected to different field conditions and modified accordingly.	The expected output of this project: ¿ A technically efficient, economically viable, and socially acceptable riding-type rice transplanter that is being manufactured by accredited manufacturers for commercial production.	PhilRice	¿ Farmers/Seed Growers ¿ Seed Centers/Cooperatives ¿ Irrigators Association ¿ NGOâ€™s ¿ Private Company (Local Manufacturers)	1-Jan-21	30-Jun-22	ONGOING	2,213,778	1,687,985
	Pilot testing of Hybrid Solar Powered Dehydrator Machine for Processing of Agri-Products	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Pilot Testing of Multi-powered Dehydrator Machine for Processing of Ginger, Turmeric and Cocoa-based Health Food Products (old title) ISATU has developed a dehydrator machine for drying leaves for herbal tea materials under the project, â€œDesign and Development of a Programmable Dehydrator Machine for Herbal Tea Materials. The ISATU developed dehydrator has been field tested at the Ephrathah Farms in Badiangan, Iloilo which reduces the farmâ€™s electric consumption and established a science-based drying protocols for the different tea products. The success of the previous research grants on the dehydrator machine and the demand of the said machine by Small and Medium Enterprises (SMEs) on food processing in Panay Island inspires the researchers to continue the research endeavor through pilot-testing study. Moreover, this pilot testing study would address the production problem of SMEs and infuse technological innovations in the food production process in order to meet the market demands and to produce agricultural products that customers needed and good quality products, boost competitiveness of the food products in the market and create more jobs for the realization of inclusive growth in the countryside and in the country as a whole.	The expected output of this project: ¿ A technically efficient, economically viable, and socially acceptable dehydrator machine that caters to different agricultural products. ¿ locally developed machine would significantly reduce the acquisition cost of dehydrators as compared to imported units.	ISAT-U	¿ Local machinery fabricators i.e.AMF Metal Industry ¿ Local food business/SMEs involved in food processing/agri-products manufacturing (Al Di Foods Iloilo, Ephrathah Farms, Conniesâ€™s Dabong Banana Crackers) ¿ Fisherfolks, local vendors and LGU of San Dionisio, Iloilo	1-Aug-21	31-Jul-23	ONGOING	4,999,474	2,853,780

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
	Solar Powered Irrigation System: A Clean Energy Management Solution to Dairy Production in Marginalized Communities in Cagayan Valley (Solar-powered Pump Irrigation System: A Clean Energy Water Management Solution to Dairy Cattle Production in Marginalized Communities in Cagayan Valley)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project intends to develop and evaluate a solar-powered pump irrigation system for dairy cattle production in marginalized communities of Cagayan Valley.	Products 1.At least 50 tons (1,250 bags) green corn-based silage produced in an irrigated one-hectare green corn forage area in dairy producing marginalized communities of Region 02. 2.Green corn produced four times a year for silage production. 3.Corn silage available year-round 4.Environment pollution free model farm equipped with solar powered source of irrigation. 5.Availability of year-round clean water/source of irrigation for green corn production. People and services 1.Capacitated at least two marginalized dairy communities and graduating agriculture students on greening the dairy environment using solar powered source of irrigation in Cagayan Valley. 2.Provided additional employment opportunities and added source of income to marginalized dairy farmers. 3.Increased awareness on renewable energy, climate change effects, mitigation and adaptation by green corn farmers. 4.Women empowerment on alternative energy applications in dairy production in marginalized communities of Cagayan Valley. Publications 1.Studies on the efficient use of the two types of solar powered pump irrigation system (fixed type and solar tracker â€" equipped) on green corn-based silage production for the dairy industry. 2.Drip irrigated and flooded irrigated green corn production. 3.Role of women in the use and enhancement of renewable energy in marginalized dairy communities. Patents 1. Designed and processes in the use of fixed type and solar tracker equipped solar powered pump irrigation systems for	ISU	All Dairy Stakeholders	1-Jun-20	31-May-22	ONGOING	4,999,904	786,043
Banana Bract Mosaic Disease (BBrMD) in the Philippines: Geographic Distribution, Yield Loss Assessment, Virus Elimination, and Evaluation of Germplasm Collection	Project 1. Distribution, Diversity and Host Range of Banana bract mosaic potyvirus in the Philippines	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	This project will characterize the disease symptoms and pathogenicity and virulence properties of the BBrMV isolates from select region in the Philippines to better understand epidemiology of BBrMD and plant-BBrMV interaction. The knowledge of the pathogenic and virulence properties of BBrMV isolates from the different regions improves our understanding of the BBrMV strains present in the country, which also tells of possible region-specific strains.	1. Knowledge on distribution maps of BBrMD 2. Optimized detection protocol for BBrMV 3. Genetic diversity of BBrMV from the Philippines 4. List of alternative hosts of BBrMV and symptom description 5. At least one journal article published	UPLB	â€" Plant pathologists, plant breeders, provincial and municipal agriculturists, extension workers, regulators (e.g. Burearu of Plant Industry â€" National Plant Quarantine Services Division) and banana growers.	1-Sep-20	31-Aug-23	ONGOING	8,850,000	1,342,094
Banana Bract Mosaic Disease (BBrMD) in the Philippines: Geographic Distribution, Yield Loss Assessment, Virus Elimination, and Evaluation of Germplasm Collection	Project 2. Evaluating the Impact of BBrMV on the Yield of Selected Banana Cultivars in the Philippines	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Yield loss assessment caused by Banana bract mosaic virus and mitigate Banana Bract Mosaic Disease in the field through different nutrient management regimes. This project is initiated to expand the narrow information available on the extent of yield loss caused by BBrMV. Common banana cultivars consumed in the country along with two promising saba strains selected from a previous DOST-PCAARRD funded project will be used as test plants to generate a coherent data on their response to the viral disease.	1. Knowledge on yield loss in common banana cultivars due to BBrMD 2. Yield loss response of Lakatan, Latundan, Cardaba, and some other promising strains. 3. Nutrient management regime for BBrMD mitigation. 4. Published at least one article	UPLB	â€" Banana growers â€" Agricultural officers/technicians â€" Non-government organizations â€" Researchers â€" Students	1-Sep-20	31-Aug-23	ONGOING	8,075,000	1,376,132
Banana Bract Mosaic Disease (BBrMD) in the Philippines: Geographic Distribution, Yield Loss Assessment, Virus Elimination, and Evaluation of Germplasm Collection	Project 3. Virus Elimination and Production of Virus-Free Planting Materials of 'Saba' Varieties	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	The limitations in the production and supply of disease-free quality planting materials of high yielding and promising â€"Saba â€"™ varieties will be addressed in this project. Continuous supply of quality disease-free planting materials will boost the existing production and will accelerate further expansion programs of the country in order to meet the growing demand of the â€"Saba â€"™ industry.	1. Optimized sampling technique for BBrMV indexing 2. Micropropagated virus-free indexed plants of Saba varieties 3. At least two protocols optimized for BBrMV elimination 4. Technology dissemination through trainings and seminars 5. In vitro bank of disease-free bananas 6. At least 1 publication	UPLB	â€" Farmers â€" Banana growers â€" Researchers â€" Tissue culture laboratories engaged in banana production â€" Agricultural workers	1-Sep-20	31-Aug-23	ONGOING	7,250,000	1,269,682
Banana Bract Mosaic Disease (BBrMD) in the Philippines: Geographic Distribution, Yield Loss Assessment, Virus Elimination, and Evaluation of Germplasm Collection	Project 4. Evaluation of Selected Irradiated Cardaba Mutants with Short Stature and Other Musa Accessions for Banana bract mosaic virus (BBrMV) Resistance	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Promising Saba strains had been identified in previous DOST-PCAARRD funded project but the reaction of these promising materials to BBrMV must be assessed and confirmed before mass propagation. All in vitro and in situ collections will be mass propagated and evaluated for reaction to BBrMV under greenhouse conditions. The reactions of promising materials will be confirmed under field condition where there is high disease pressure. The mechanism of resistance will be analyzed.	1. Confirmed reactions of Cardaba and Saba to BBrMD. 2. Confirmed reactions of in vitro and in situ germplasm collections to BBrMD. 3. Data on field performance of promising lines. 4. Information on the mechanism of resistance to virus and vector 5. Published at least 1 article in ISI-indexed journal	UPLB	â€" Banana growers â€" Agricultural officers/technicians â€" Non-government organizations â€" Researchers â€" Students	1-Sep-20	31-Aug-23	ONGOING	8,825,000	1,789,963
Development of Integrated Crop Management (ICM-Tomato) for Increasing the Productivity of Fresh and Processing Tomato Production	Project 1. Development of Disease Management Technologies for Fresh and Processing Tomato Production	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Tomato (Solanum lycopersicum L.) is the fourth major vegetable crop in the Philippines. It is grown mainly for its fruits which are either consumed fresh or processed into paste. Tomato production provides an important source of livelihood to Filipino farmers. Many farmers grow tomato as a major vegetable crop because of its high crop value. Tomato production is a growing industry in the country with a production volume of 214, 576 MT (PSA, 2015). Tomato is grown all over the country and the top producing regions by volume of production are Ilocos Region (34%), Northern Mindanao (22%) and Central Luzon (11%). The other production areas contribute 34% of the total volume of production. The top producing provinces are Bukidnon (18.4%), Ilocos Norte (14.1%), Ilocos Sur (10.8%), Pangasinan (8.1%) and Nueva Ecija (5.7%). The Ilocos Region, particularly in Ilocos Norte and Ilocos Sur grows tomato mainly for processing, and it is where the only tomato processing plant, the Northern Foods Corporation (NFC), in the country is located. The NFC in Ilocos Norte supplies 4,000 tons (13.3%) amounting to PhP 232 M of the 30,000 MT demand for tomato paste in the country. The other 24,000 MT of the demand is imported mainly from China. The processing tomato is grown after rice in a total area of 800 ha involving about 2,000 contract growers, each with an average of 0.40 ha landholdings. However, tomato production is affected by several constraints including diseases (Fresco, 2001). Tomato leaf curl is the most serious and widespread disease of tomato in the country causing significant yield reduction in both fresh and processing tomato production. The disease is caused by a virus transmitted by whitefly which can build up their population at high level during the dry season when tomato is being grown. The damage caused by tomato leaf curl largely contributes to low crop productivity and sustainability of fresh and processing tomato production. For instance, the occurrence of leaf curl disease affects the productivity of processing tomato production resulting in about 18-50% reduction of crop yield and even higher with very severe infections. Leaf curl disease occurs in every tomato season although of varying severity, and thus the crop cannot be grown free from the disease. Currently, the Ilocos Red variety is the only processing tomato available for processing tomato production. It has a potential yield of 60 tons/ha. However, the variety is highly susceptible to tomato leaf curl. Under moderate disease, the yield is 40 tons/ha while 30 tons/ha with more severe disease. Under very mild infection, the yield can reach up to 50 tons/ha. However, the disease is generally moderate to severe (Mendoza, 2017, personal communication). Under this situation, NFC can produce an average of 4000 tons/year of tomato paste. The low capability of NFC to produce more tomato paste is partly attributed to pest problem mainly leaf curl disease. The breeding program of NFC has produced some tomato lines showing some level of tolerance to the disease. However, these lines do not possess the processing quality comparable to that of Ilocos Red. The level of tolerance also needs to be improved (Mendoza, 2017). The average yield of fresh tomato is 13.5 tons per ha. Yield reduction is estimated to be as high as 45% which can be partly attributed to tomato leaf curl.	1.At least two (2) publications in ISI-indexed journal 2.Disease profile in fresh and processing tomato production 3.Efficacy of healthy seedling technology for leaf curl management in fresh and processing tomato production 4.Determined the effective concentration and induction time of carrageenan application, and efficacy of the carrageenan technology for leaf curl management for fresh and processing tomato production 5.IEC materials on healthy seedling and carrageenan technologies, and ICM recommendation. 6.Trained manpower in the form of students BS (1 BS Agriculture - Plant Pathology and 1 MS (Plant Pathology) and their thesis research supported by the project	UPLB, NFC	Researchers will benefit from the generated scientific information about integrated crop management for fresh and processing tomato production using adaptable technologies and site specific disease management. Government extension agencies (RCPCs, SUCs, and LGUs) will benefit from the gained scientific information and generated products and technologies. Students and SUCs will benefit from the trained manpower that will be one of the outputs of this project. Tomato farmers will be the ultimate beneficiary of project outputs.	1-Nov-17	31-Oct-20	COMPLETED	6,726,305	700,428

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
Development of Integrated Crop Management (ICM-Tomato) for Increasing the Productivity of Fresh and Processing Tomato Production	Project 2. Development of Insect Pest and Weed Management Technologies for Fresh and Processing Tomato Production	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Tomato, second to eggplant, is the most widely cultivated vegetable in the Philippines. The crop is grown using varied cultural management practices and under different cropping systems, which include the highland, upland, lowland after rice cropping system and under protected structures. It has also special cultivars for specific market like table tomatoes, salad tomatoes and processing tomatoes. Production of the latter is restricted in the Ilocos region where the only operational processing plant in the Philippines is located, the Northern Foods Corporation (NFC), a government-owned and controlled corporation. Northern Foods Corporation supplies 4,000 tons (13.3%) amounting to PhP 232 M of the 30,000 MT demand for tomato paste in the country. The other 24,000 MT of the demand is imported mainly from China. The processing tomato is grown after rice in a total area of 800 ha involving about 2,000 contract growers, each with an average of 0.40 ha landholdings. Tomato production is a growing industry in the country with a production volume of 214, 576 MT (PSA, 2015). It is grown all over the country and the top producing regions by volume of production are Ilocos Region (34%), Northern Mindanao (22%) and Central Luzon (11%). The other production areas contribute 34% of the total volume of production. The top producing provinces are Bukidnon (18.4%), Ilocos Norte (14.1%), Ilocos Sur (10.8%), Pangasinan (8.1%) and Nueva Ecija (5.7%). Insect pests remain a major limiting factor in the profitable production of tomato. Though it has relatively fewer species of pests of major importance than on eggplant, early detection and correct diagnosis is much critical in tomato because of its more herbaceous growth habit and shorter productive period and more importantly, its susceptibility to several virus diseases. The crop is quite sensitive to injuries resulting from the feeding activity of the pests and has less time to recover or compensate from these injuries. This makes for a more systematic planning in formulating pest management (PM) program for the crop. A major constraint in developing PM program is the need to deal with complex of pests and emerging pests where control strategies may not be compatible. The challenge among pest managers is to identify management practices and available biological control agents for some pests that are compatible to or will allow the use of selective insecticides for other pests in which non-chemical control tactics are not yet available. Withholding of early season applications of insecticides may be tried to encourage build-up of other natural enemies or the use of biological control agents like Trichogramma chilonis, Earwigs, and Nucleopolyhedrosis viruses (NPVs) for some major pests of tomato like fruitworm and cutworm. Trichogramma, earwigs and NPVs have been used to manage pests of economically important crops; technologies for its mass production and field application have been tested and recommendations regarding its utilization have been formulated. In particular, Trichogramma chilonis have been found effective in managing fruitworm population through release of the parasitoid at the rate of 25 tricho cards per hectare starting at 2 weeks after transplanting (2 WAT) followed by weekly releases for 5 weeks (Gonzales et al., 1991). Meanwhile, spraying of Helicoverpa NPV (HNPV) mixture 3-4 times at 2 WAT is also recommended (Barisan et al.). The HNPV mixture is composed of 10-15 HNPV-infected fruitworm larvae per 16 liters of	1.Site-specific insect pest succession pattern under a given crop growing environment (climatic and edaphic factors) and pest management (biological, cultural, behavioral and chemical control) in fresh and processing tomato production 2.Efficacy of modified release strategy of biological control agents and carrageenan technology to manage insect pests of fresh and processing tomatoes 3.Improved weed management strategies in fresh and processing tomato production 4.Field validated ICM recommendation 5.At least 3 scientific paper published in ISI-indexed journals and IEC materials on insect pest succession pattern and emerging insect pests, training materials on village-level mass production of biological control agents, crop protection technology recommendations (insect pest & weeds) 6.Trained at least 20 farmers in village-level mass production and utilization of Trichogramma, earwigs and NPV for fresh and processing tomato production for each site; Enhanced capability of RCPC bicon laboratory in mass production 7.Enhanced the capability of trained farmer leaders, extension and project personnel on information campaign strategies of biologically-based insect pest management 8.MOA with SUC, LGU and Cooperative. 9.Enhanced the capability of RCPC I in mass production of BCAs 10.Established network and collaboration with partners such as Mariano Marcos State University, Northern Foods Corporation, Regional Crop Protection Center I, local government units, Farmer's Leaders, Cooperators and Cooperative.	UPLB	Researchers and students will benefit from the generated scientific information about the site specific succession pattern of insect pests and biological control based crop protection technologies for fresh and processing tomato. Tomato growers and government extension agencies (DA-RCPCs, SUCs) will benefit from technologies, recommendations, and trainings on mass production of biological control agents.	1-Nov-17	31-Oct-20	COMPLETED	4,199,098	247,954
Development of Integrated Crop Management (ICM-Tomato) for Increasing the Productivity of Fresh and Processing Tomato Production	Project 3. Development of Site-Specific Nutrient Management Program for Tomato Production	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Tomatoes grow well in fertile soil with a lot of organic matter. The common fertilizer application rates for tomato under tropical condition is 60-120 kg N, 60-140 kg P and 60-120 kg K per hectare (PCAARRD, 2015). While some farmers, especially those that have been adequately provided with extension and technical assistance, follow the recommended rate, most farmers either apply excessively or below the recommended rate. In nutrient or fertilizer management, the amount, timing, and type of fertilizer to be applied are crucial in attaining optimum yields. Of equal importance, is the nutrient-supplying capacity of the soil which may vary with production area due to varying soil physico-chemical properties that affect the storage, release of nutrients and crop uptake of nutrients. Fertilizer recovery efficiency in tomato production areas is also important. This parameter is greatly affected by tomato crop and its interaction with environment (climatic & edaphic). Set target yield is also an important consideration in determining appropriate amount and ratio of fertilizer nutrients to be applied that will support the expected plant biomass and economic yields that have to be attained. Tomatoes are heavy feeders and need high amount of nitrogen, phosphorous and potassium within a crop cycle. A ton of fresh fruit will require about 2.5-3 kg N, 0.2-0.3 kg P, and 3-3.5 kg K (Hegde, 1997). The Philippines is reported to be self-sufficient in fresh tomato but not of the processing type. But despite self-sufficiency in fresh tomatoes, the potential to increase tomato yield, both fresh and processing is tremendous. One way to achieve this is through site-specific nutrient management (SNNM). SSNM approach advocates sufficient use of nitrogen (N), phosphorus (P) and potassium (K) fertilizer to overcome deficiencies, and accounts to some extent for the nutrient removal of P and K with harvested products to avoid the depletion of the soil nutrient supply (Ocampo et. al., 2015). The end-result is to maximize financial advantage and minimize production risks while at the same time ensuring environmentally-sound production practices. Farmers profit is increased by increasing crop yield per unit fertilizer applied and reducing disease and insect damage (IRRI 2008). Site-specific nutrient management which considers soil variability, crop nutrient requirement, nutrient supplying capacity of soil, efficiency of nutrient utilization and productive capacity of the varieties would reduce the cost of production from fertilizer and increase yield while maintaining a healthy soil. However, proper nutrient management is just one aspect of tomato production. The other equally important aspects are disease and insect pest management. To fully benefit from the advantages of site-specific nutrient management, and to generate a more significant impact on improving tomato production, site-specific nutrient management should be complemented with effective disease and insect pest management strategies. An integrated crop management strategy involving site-specific fertilizer recommendation, along with effective and adaptable disease, insect pest and weed	Year 1 â€Networking and coordination with NFC, LGUs, MMSU and farmers in the selected sites â€Baseline profiling of farmers nutrient and soil management practices/production systems â€Profiling, collection and laboratory analysis of soil characteristic â€Consolidated baseline data for use in the formulation of SSNM â€Set-up MOET and OPT in selected farmersâ€™ fields â€Identified yield-limiting nutrients in farmers field â€Estimated yield and various nutrient use efficiency parameters â€Estimated soil nutrient supplying capacity â€Determinated/formulated fertilizer rates for the SSNM treatment plot â€Formulated ICM incorporating specific fertilizer recommendation and disease, insect pest and weed management Year 2 â€Set-up ICM experiment in farmersâ€™ fields â€Monitored crop response to the integrated crop management strategy â€Estimated yield and various nutrient use efficiency parameters Year 3 â€Field validated ICM strategy and evaluation crop responses to the recommendation â€Estimated various nutrient use efficiency parameters â€Fine-tuned and calibration of ICM strategy â€Prepared manual and IEC materials on site-specific nutrient management technology â€Prepared and submitted articles on the result of the experiment for publication	UPLB	NFC which is the only processing company for tomato in the country will benefit from this technology as well as their farmer cooperators. Researchers will benefit from the generated scientific information and datasets that are basic inputs in the development of site-specific nutrient management program for tomato in selected tomato growing areas/domains in the Philippines. Government extension agencies (DA, SUCs) will benefit from the developed site-specific nutrient management program, that is generated from a decision-aided tool, and integrated in an integrated crop management for tomato. Students will benefit in terms of undergraduate/graduate reseach conduct, while government agencies in terms of capacity building within the area of nutrient management R & D and application of decision-aided tool in nutrient management as a component of tomato ICM. Trained manpower will be one of the major outputs of this project.	1-Nov-17	31-Oct-20	COMPLETED	4,259,408	384,954
Enhancing Competitiveness of Philippine 'Carabao' Mango through Varietal Improvement Program "Molecular Markers in 'Carabao' Mango Associated with Peel Color and Thickness, and Resistance to Anthracnose and Fruit Fly- old title"	Project 1. Characterization of 'Carabao' and other Mango Varieties with Red Blush and Thick Peel, and Development of Hybrids	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	'Carabao' mango, the country's only export variety, is one of the best varieties in the world. The distinct taste and nutritional value of the â€œCarabaoâ€Ý mango puts it above any other mango varieties in the world. Despite high production and the good climatic conditions to produce mango fruits all-year round, the export potential of this variety is hampered by small land holdings resulting to inconsistency in quality, low percentage of exportable quality production, and short shelf life. Constraint posed by these problems could be solved by varietal and genetic improvement to produce improved mango varieties with thicker peel and red blush color of skin, better shelf life, and smaller tree for easier management. On-site selection and identification of different varieties available in the country could also give us bright opportunities to offer and import wider range of mango varieties, which can suit different consumer preferences especially during off-season or lean months of 'Carabao' mango production. Peel thickness is also an important trait of mango because thicker peel renders the mango fruit more resistant to insect pest and disease development and longer shelf life	1. Validated 3 potential 'Carabao' mango strains/selections with red blush and 1 with thick peel from other mango varieties 2. Identified at least 1 stop-gap mango cultivar/variety for 'Carabao' mango 3. Produced 3 more putative hybrids by pairing/clipping method of hybridization 4. Established breeding blocks for mangro hybridization program 5. Fully characterized fruits of 3 hybrids produced from the previous project 6. Published at least 2 papers in scientific journals	UPLB	1. Mango growers/exporters 2. Researchers 3. Breeders 4. Researchers/Breeders	1-Nov-15	30-Apr-22	ONGOING	15,949,890	2,311,116
Enhancing Competitiveness of Philippine 'Carabao' Mango through Varietal Improvement Program "Molecular Markers in 'Carabao' Mango Associated with Peel Color and Thickness, and Resistance to Anthracnose and Fruit Fly- old title"	Project 2. Characterization of 'Carabao' and other Mango Varieties with Resistance to Fruit Fly and Anthracnose	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	In the past, evaluation of different mango varieties for resistance to different pests and diseases has been conducted through the project entitled: Improvement of â€˜Carabaoâ€™ mango fruit characteristics with resistance to insect pests and diseases. Potential resistance of different trees to major insect pests and disease were also identified. Based on the results gathered from the previous study, it is very important to verify and confirm the resistance of different selected materials especially the fruit fly and anthracnose resistant accessions. Such characteristics should also be utilized for the improvement of our â€˜Carabaoâ€™ mango and development of other stop-gap varieties.	1. Confirmed reaction of 3 'Carabao' and 2 other mango varieties resistant to anthracnose 2. Confirmed reaction of 2 'Carabao' and 1 other mango variety resistant to fruitfly 3. Confirmed reaction of 3 hybrids from the previous project and 3 new hybrids 4. Published at least 2 journal articles	UPLB	1. Mango growers/exporters 2. Researchers 3. Breeders	1-Nov-15	30-Apr-22	ONGOING	10,411,430	1,815,744
Improvement of Soybean (Glycine max (L.) Merr.) for Better Nutrition, Higher Income, and Enhanced Soil Health	Project 2. Soybean for Higher Income and Enhanced Soil Health Under Different Cropping Systems	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	While farmers are already convinced of the suitability and potential of soybean as rotating crop and intercrop, it is imperative therefore to establish scientific bases on the effects of soybean production on soil health and farm productivity under different cropping systems/patterns. Results of which will help farmers decide on what appropriate varieties and cultural management practices they will be adopting to achieve higher yield and income, hence this project will be conducted.	Publications(10),Different cropping system practices (corn-based, rice-based & cassava-based) and soil health i)"Refereed (2) ii)"Non-refereed (3) iii)"IEC materials (leaflets, posters, radio program) â€" (5) Products (3) --- Technologies for optimum yield management under different cropping systems (rice-based, corn-based, cassava-based) for Regions 02, 10, 11 & 13 - (3) People & Services --- Trained farmers/stakeholders on the developed technology (900)	UPLB, DA-RFO 2, DA-RFO 10, DA-RFO 11, DA-RFO 13	a.Farmers in corn, rice, cassava- based farming communities will see the benefit of including soybean in their cropping system specifically its impact on soil health. b.Agri-entrepreneurs (SMEs)	1-May-18	30-Apr-21	COMPLETED	15,744,919	1,010,443

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
Improvement of Soybean (Glycine max (L.) Merr.) for Better Nutrition, Higher Income, and Enhanced Soil Health	Project 3. Enhancing the Sustainability of the Informal Soybean Seed Sector	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	An important challenge for the informal seed sector is maintaining seed quality on-farm. The success of any crop production enterprise depends on the quality of seeds for planting. A deteriorated seed will naturally result to poor crop growth and performance and subsequently, to lower yield. Therefore, what is already being done by the farmers should be enhanced by the current state of the art techniques. The project will focus on advancing farmer seed saving techniques, from seed selection to storage, and on developing sustainability mechanisms including expanding governance, developing local seed business, integrating with the local soybean markets, and enhancing linkage with the formal seed system.	Publications (14) a. Sustainability mechanisms i) Refereed papers: 1 ii) Conference papers: 2 iii) Guides, factsheets, technical info: 1 iv) Leaflets, posters, and related IECs in English and 1 local language: 1 b.On-farm seed processing and storage i)Refereed papers: 1 (shared with on-farm seed selection) ii)Conference papers: 2 iii)Guides, factsheets, technical info: 1 iv)Leaflets, posters, and related IECs in English and 1 local language: 2 c.On-farm seed selection i)Refereed papers: (shared with on-farm seed processing and storage) ii)Conference papers: 1 iii)Guides, factsheets, technical info: 1 iv)Leaflets, posters, and related IECs in English and 1 local language: 1 â€¢Patents â€¢Products (3) a.On-farm Seed Processing and Storage: 1 system recommended b.On-farm Seed Selection: 2 varieties purified, multiplied, and distributed â€¢People Services â€" training a.Sustainability mechanisms: 3 farmer organizations assisted (related to partnerships) b.On-farm seed processing and storage: 100 farmers trained c.On-farm seed selection: the same farmers as in trained in seed processing and storage â€¢Partnerships: 3 MOAs with farmer organizations and LGUs	UPLB, DA-RFO 2, DA-RFO 10, DA-RFO 11, DA-RFO 13	1.DA and LGU policy makers might be encouraged to enhance support to informal seed systems for all crops 2.Farmers growing soybean and saving their own seeds will be assisted in saving better quality seeds 3.Agricultural technicians and extension workers promoting soybean production will have better understanding of soybean seed saving 4.Researchers and experts working on soybean and other difficult-to-store orthodox seed crops will be assisted in proper seed processing and storage 5.Entrepreneurs who may want to engage in the business of high quality soybean seeds 6.Genebanks (all crops) will benefit from the additional detailed information on seed anoxia	1-May-18	30-Apr-21	COMPLETED	14,566,795	1,600,277
Improvement of Soybean (Glycine max (L.) Merr.) for Better Nutrition, Higher Income, and Enhanced Soil Health	Project 4. Soybean Variety Development for Large Seed Size, Higher Yields, and Enhanced Functional Properties	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Soybean in 2015 is mainly used for processing (61,733 mt) and roughly one-third is for food (22,408 mt). However, local varieties are less preferred for processing because of the small seed size. Meanwhile there is an increasing demand for soybean products because of their health benefits particularly as source of plant-based protein, antioxidants and for management of cholesterol levels and other cardio-vascular problems from its lunasin content. Manchuria is the preferred variety but yield is lower than the Tiwala Series. It has a narrower adaptation than Tiwala. It would benefit the farmers and the industry in general if Manchuria can be improved to have higher yield and wider adaptation including tolerance to pests and diseases. Overall, the industry needs soybean varieties with larger seeds, good processing quality and enhanced functional properties banking on the health effects of the flavonoids unique to soybean (isoflavones) and lunasin.	a.Two (2) variety recommendations for the 2 major agro-climatic zones b.Ten (10) stable soybean lines with large seeds, good processing quality, high yields and tolerance to diseases c.Two (2) soybean lines with enhanced levels of functional properties (isoflavones and lunasin) d.Three (3) publications e.Two (2) thesis students mentored	UPLB, DA-RFO 2, DA-RFO 10, DA-RFO 11, DA-RFO 13	a. Rice farmers with potential to grow soybean after the rice crop b. Corn farmers with potential to grow soybean after the corn crop c. Upland farmers	1-May-18	30-Apr-21	COMPLETED	13,627,821	1,574,705
Improvement of Soybean (Glycine max (L.) Merr.) for Better Nutrition, Higher Income, and Enhanced Soil Health	Project 6. Improvement of Soybean in Davao Oriental through Enhanced Value Chains, Sustainable Seed Sector, and Better Varieties Under Different Cropping Systems	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Although soybean production is well established in the Cateel river floodplain, its expansion has been limited by competing crops such as irrigated rice and corn and unfavorable supply chain and markets. Soybean is grown as a cash crop and volatile prices have discouraged the farmers to continue its production. Moreover, local consumption and utilization is very limited. The DOST-PCAARRD is currently funding the implementation of the program entitled â€œImprovement of Soybean (Glycine max (L.) Merr.) for Higher Income, Enhanced Soil Health, and Better Nutritionâ€. The soybean technology to be developed will include soybean as essential component of a sustainable cropping system, improved seed maintenance and storage, and better varieties.	Publications â€¢ One (1) guide/factsheet/technical info â€¢ One (1) IEC material in English and in local language (leaflet/poster/related material) â€¢ Training People Services â€¢ Two (2) organizations assisted (related to partnerships) - with 20 households for each organization â€¢ Twenty (20) students trained Partnerships â€¢ Two (2) MOAs with organizations	DOSCST	1. DA and LGU policy makers encouraged to enhance support to soybean production and utilization 2. Upland farmers assisted in growing soybean and saving their own seeds 3. Agricultural technicians and extension workers promoting soybean production will have better understanding regarding soybean production and utilization 4. Entrepreneurs encouraged to engage in the soybean business	1-May-19	30-Apr-21	COMPLETED	2,499,500	618,875
	Biological Control of Fall armyworm, Spodoptera frugiperda (J.E. Smith) (Lepidoptera: Noctuidae) Using Entomopathogens (i.e., bacteria, fungi, NPV)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Biological control studies of S. frugiperda in this project proposal will include Mass rearing studies using natural hosts and meridic diets in the laboratory (Study 1), Laboratory and field evaluation of nucleopolyhedrovirus against FAW (Study 2). Laboratory and field evaluation of entomopathogenic fungi (Study 3) and 4) Laboratory and field evaluation of entomopathogenic bacteria and nematodes (Study 4). The objectives will be geared towards generation of local data about S. on entomopathoges of S. frugiperda on corn and other commonly infested host plants in corn- growing areas in Luzon as bases for the development of IPM strategies that are climate change resilient, ecologically friendly and sustainable.	â€¢Data on mass rearing technique for FAW â€¢Preliminary evaluation of OAW and Cutworm entomopathogens against FAW under laboratory conditions â€¢Preliminary efficacy testing of entomopathogens continued â€¢Field tested effective entomopathogen/s â€¢Shelf life, delivery system of entomopathogens â€¢Mass produced effective entomopathogens	UPLB	1. Corn Growers 2. Researchers/ Breeders 3. Agricultural Technicians 4. R&D planners, researchers, policy makers	1-Feb-20	31-Jan-22	ONGOING	4,672,076	1,706,153
	Breeding and Transcriptomics of Fusarium Wilt Resistance for a Competitive Local Banana Industry	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	This project shall embark on mutation and conventional breeding strategies to generate improved banana cultivars. The popular local dessert variety â€"Lakatanâ€™ will be subjected to in vitro chemical mutagenesis to create desirable lines with tolerance/resistance to Fusarium wilt caused by Foc TR4. Crosses following established banana breeding schemes will also be employed using the FHIA improved male-fertile diploid SH-3142. These activities shall result in new and improved genetic resources and cultivars of banana. This project shall also identify genes/network of genes responsible for Foc TR4 resistance of select banana germplasm. Analysis of transcriptome in conjunction with differential gene expression will shed light on the functional variation and underlying biochemical pathway of TR4 resistance. The project shall use DEG-markers that have been reported to exhibit some degree of Fusarium wilt tolerance/resistance to explore other banana germplasm. The information gleaned from these studies can also be of direct use for gene-editing projects in the future.	1. Molecular basis of resistance to Foc TR4 2. Transcriptome and differential gene expression profiles of resistant and susceptible bananas 3. Mutant populations of â€"Lakatanâ€™ 4. Early screening of putative tolerant/resistant mutants for forwarding to field evaluation	UPLB	â€¢ Molecular biologists and geneticists from public and private institutions â€¢ Young professionals and student researchers involved in molecular biology and breeding projects â€¢ Banana farmers/growers	1-Feb-21	31-Jan-24	ONGOING	12,995,550	5,315,312

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
	Comparative Genomics of the Armored Scale Insects, Aspidiotus destructor Signoret and A. Rigidus Reyne (Hemiptera: Diaspididae)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Although the whole genome sequences of a number of insect pests has been published, no information on armored scale insects has been reported. DNA sequences for A. destructor and A. rigidus are limited to DNA barcodes for phylogenetic studies (Gruwell et al., 2007, Gruwell and Normark, 2009, Andersen et al., 2010, Campbell et al., 2014, Guerrero and Caoili, 2015, Caoili et al., 2015, 2017 and Amouroux et al., 2017). The availability of the whole genome can also be used to scan for genes that are correlated with insect resistance of coconut varieties as well as understand the roles of insect effectors in plant infestations. This information will help design strategies for future coconut breeding researches. This project therefore, aims to generate at least a draft genome of the two (2) coconut scale insects, A. destructor and A. rigidus, which will be utilized for comparative analysis and mining to identify genes of pest management importance.	1.Genome size estimate of Aspidiotus destructor and A. rigidus; 2.Draft genome sequence of A. destructor and A. rigidus submitted to the GenBank or other online databases; 3.Partial list of genes of pest management importance; 4.Partial list of SSR and SNP markers for the two (2) coconut scale insect species; and, 5.A paper presented in conferences leading to a research publication in ISI or Scopus-indexed journal.	UPLB	The target beneficiaries are other researchers specifically those studying coconut scale insect and its management, students, policy makers, and most importantly the Filipino coconut farmers.	1-Jun-20	31-May-22	ONGOING	5,000,000	1,419,681
	Development of an Early Warning System against Fall Armyworm, Spodoptera frugiperda through Population and Distribution Modelling	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	In the Philippines, there are four species of noctuid pests under the genus Spodoptera , namely: S. exigua, S. exempta, S. litura, and S. mauritia. These species are considered highly invasive, polyphagous and economically important pests to approximately 36 crop species (e.g. maize, rice, sorghum, sugarcane and wheat, and other vegetable crops- cabbage and onion and cotton). Middle of this year, presence of another species of Spodoptera, Spodoptera frugiperda popularly known as fall armyworm (FAW) was detected in Cagayan and Ilocos Norte set an alarm to government agencies, academe and private industries due to its fast spread attributed to its strong migratory behavior. Fall armyworm, considered native to America got introduced and first reported in Africa in 2016. After 2 years it had crossed to the Asian continent. Presence of FAW was confirmed based from two (2) larval samples collected in Piat, Cagayan (Navasero and Magsino, 2019). Based from the confirmation for the presence of FAW in the Philippines, one of the grave concerns is to provide an Integrated Pest Management Program (IPM), specific for FAW. The first course of action for introduced and invasive species is to use chemical control. However, insecticides to be recommended for use should be properly selected taking into consideration the efficacy, residue profile and relative safety to non-target organisms. In addition, plants with insecticidal or repellent properties must be explored to increase available options among farmers since pesticide resistance occur at faster rate. This information is important in crafting Insecticide Resistance Management (IRM) program for FAW. Similar approach was done for onion armyworm, Spodoptera exigua, a major problem in onion production.	â€CModel/s that can simulate population and number of FAW generations through time. â€CMaps of potential spread and distribution of FAW in PH. â€CFall armyworm monitoring and early warning system. â€CIEC materials containing potential population and distribution delivered to farmers and partners in government and private industry.	UPLB	1. Corn Growers 2. Researchers/ Breeders 3. Agricultural Technicians 4. R&D planners, researchers, policy makers	1-Feb-20	31-Jan-22	ONGOING	4,709,463	1,875,944
	Development of Improved Eggplant Varieties with New Plant Defense Genes for Multiple Insect Resistance using Innovative Technologies	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Eggplant, Solanum melongena L., is one of the most important and popular vegetable crops grown and consumed in the Philippines. For the past 10 years, it has remained as the leading vegetable crop grown in the country with an average total production area estimated at 21,481 hectares valued at Php 2.599B at constant prices (PSA, 2017). Eggplant production is severely constrained by two major insect pests, the eggplant fruit and shoot borer or EFSB (Leucinodes orbonalis Guenee; Lepidoptera: Crambidae) and leafhopper or LH (Amrasca biguttula (Ishida); Hemiptera: Cicadellidae). Yield losses from EFSB and LH infestations have been estimated at up to 90% and 50%, respectively, at severe pest pressure. Farmers use excessive amount of chemical sprays to control EFSB and LH because conventional breeding for resistance has failed to produce commercial varieties with acceptable levels of resistance to these pests. Other control practices are more expensive, impractical and/or ineffective. The preferred control method of heavy insecticide application significantly increases input cost by 25-30% and more importantly, poses immediate and long-term hazards on human health and the environment. It is expected that EFSB and LH infestations will be get more severe because of climate change and intensified production system for food security. Therefore, it is imperative to develop effective and environmentally sustainable solutions to control EFSB and LH. Consequently, this will improve farmers â€™ productivity and consumer access to this important food crop. The release of insect resistant varieties remains the best option which researchers can provide to farmers. Through the years, Institute of Plant Breeding (IPB) of UPLB has maintained an active eggplant breeding program using both conventional and non-conventional breeding techniques. IPB has released NSIC-approved OP eggplant varieties	1) A well characterized Philippine eggplant germplasm collection and database for local and global eggplant community 2) Eggplant insect resistance breeding pipeline consisting of parent lines, specialized populations, elite inbred lines, advanced breeding lines, and improved varieties with various combinations of defense gene/alleles for resistance to EFSB and LH for plant breeders, other researchers, students, farmers and/or consumers, seed companies; 3) Eggplant R&D resources and tools for scientists and academics: molecular maps and markers, genome/genes sequences of eggplant and target pests associated with plant defense mechanisms; NBT-related eggplant protocols 4) IT-based validated phenotyping apps and HTP screening technique for components of EFSB and LH resistance for entomologist, breeders, genebank researchers, students, extension workers; other relevant govt agencies; 5) at least five (5) publications in ISI journals and at least three (3) paper presentations per year in scientific meetings for other researchers, graduate students and the wider academic community; 6) at least three (3) MS graduates (Genetics, MBB, Plant Breeding, Entomology or Computer Science) and five (5) IPB researchers and (5) support staff with enhanced knowledge and training in marker technology, genomics, NBT and regulation and/or IT-based screening techniques 7) IEC materials and training activities specifically on NBT for other stakeholders and the general public.	UPLB, UPD	The target beneficiaries of the project research results are: i. Public and private sector institutions â€" academic and research institutes, SMEs involved in eggplant industry i. Eggplant researchers â€" plant breeders, gene bank managers, entomologists, geneticists, molecular biologist, i. Students interested in plant breeding, entomology and agricultural sciences i. Policy makers, regulators, agricultural extension workers - i. Farmers/consumers â€" long-term beneficiaries of profitable, less costly and safe varieties	1-Jul-18	30-Jun-23	ONGOING	36,668,412	3,650,743
	Development of Low Glycemic Index Rice Through Induced-Mutation and Marker-Assisted Selection (Old Title: Development of Low Glycemic Index Rice through Induced-mutation and Marker-assisted Backcrossing)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Glycemic index (GI) is a measurement carried out on carbohydrate-containing foods based on their tendency to increase blood glucose. It gives relative value on how fast carbohydrates in food is converted into glucose. On a nutritional point of view, a low glycemic index value is considered beneficial, especially to individuals suffering from diabetes. Rice, being one of the primary dietary sources of carbohydrates worldwide, especially in Asia, is of particular interest when it comes to assessing its glycemic index. The glycemic index (GI) of rice is known to be relatively high compared to other starchy foods. A GI of 96 for brown rice and a range of 58â€"104 for white rice was reported in the study of Jenkins et al. (1984). Miller et al. (1992) also reported GI value ranging from 64 to 93 for freshly cooked rice. Pure glucose has a GI of 100, which represents the standard value for index measurements. Another way of controlling type II diabetes is the consumption of foods rich in resistant starch (RS). Resistant starch are slowly digested and absorbed by the small intestines, hence, it decreases postprandial glucose or the glucose level in the blood after a meal (Raigond, Ezekiel, and Raigond, 2015). Aside from its positive effect on blood glucose level, RS also potentially protect against pathogen infection, diarrhea, inflammatory bowel disease, colon cancer, and chronic renal and hepatic diseases. These benefits are linked to the ability of RS to escape digestion and reaches the large intestines, where it is fermented by colonic bacteria producing short chain fatty acids (Carciofi, et al., 2012). Reports also show that RS consumption can increase satiety which may lead to reduction of calorie intake and helps in weight management. Rice is a staple food among Filipinos, and lowering the glycemic index in rice is a great measure to decrease the incidence of diabetes in the country.	Expected Outputs: 1.Publication â€"1 publishable scientific article 2.Patents/IP â€" 1 copyrighted knowledge product leaflet on low glycemic index rice 3.Products â€" 1 low glycemic index rice line and 1 knowledge product leaflet 4.People Services â€" 1 BS and 1 MS students, farmers and other stakeholders who will be the recipient of the knowledge product leaflets 5.Places and Partnerships â€" Memorandum of Agreement formed between DOST-PCAARRD, DOST-PNRI, Mariano Marcos State University and Philippine Rice Research Institute 6.Policy - Promotion of low glycemic index rice for possible adoption through partnership with PNRI	PhilRice-Batac	Filipino consumers, farmers, students, other stakeholders	1-Jan-20	31-Dec-22	ONGOING	6,948,772	1,718,067
	Development, Genotyping and Preliminary Evaluation of Genetically Stable Planting Materials of Selected Medicinal Plants	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	The project will focus on some of the DOH-recommended medicinal plants, and those plants prioritized by DOST-PCHRD and the herbal industry. As mentioned earlier, this will also serve as a re-entry project of the DOST GREAT program.	â€C At least one (1) ISI-indexed journal article â€C At least one (1) poster/paper presented in scientific conferences â€C At least 9 genetically stable, characterized and evaluated accessions/lines/genotype as reference and standard â€C At least 3,000 seeds of the four (4) sexually propagated and genetically stable medicinal plant ready for distribution and safety duplication â€C At least 50 propagules/seedlings of the five (5) asexually propagated medicinal plant ready for distribution â€C 4 project personnel trained on breeding, genetic resource conservation and management of medicinal plants â€C One (1) Bachelor â€™s, and one (1) Master â€™s student trained on genotyping, and evaluation of medicinal plants	UPLB	The target beneficiaries of the project research results are: Research organizations, men and women researchers, scientists, students, medicinal plant growers, and the general public will benefit from a promising and genetically stable source of planting materials of medicinal crop species.	1-Jul-21	30-Jun-23	ONGOING	4,999,216	2,761,608

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	Effect of temperature and host plants on the life history traits of Spodoptera frugiperda (J.E. Smith) (Noctuidae: Lepidoptera)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	In the Philippines, the emergence and invasive pests has been reported but there are limited publications, or some cannot be accessed easily. There are several factors to consider in the rapid spread of invasive pests. Climate is one of these factors and it plays a major role in determining the distribution and abundance of insects (Walter and Hengeveld 2000). More specifically, climate plays two principal roles: as a limiting factor that determines the relative importance of various biotic factors of population dynamics, and as a source of environmental variation that affects physiological rate processes and mediates interspecific interactions. The first role is considered secondary in comparison to the latter, which regards the physiological requirements and tolerances of individuals within the population as the key determinants of survival and reproduction, and thus abundance (Walter and Zalucki 1999). There are studies that emphasized the role of biotic and abiotic (environmental) factors in structuring trophic interactions. Abiotic factors, such as inorganic resources and the ambient environment such as light, temperature can have significant consequences for natural populations, either directly or indirectly, by altering biotic quality and quantity manifested for instance in host-plant quality and number or insect abundance and distribution (Hunter and Price 1992). Studying the effect of these factors (biotic and abiotic) on the development of insect pest will be beneficial to understand better the population dynamics of an insect. This gives us a clue on the extent of infestation on different plant families and explain the mechanism or nature of polyphagy in this kind of insect pest.	PublicationsGenerate at least two peer-reviewed publications in a recognized scientific journal Web of Science or Scopus-indexed journal Patents/IPDamage rating scale for field assessment ProductsAlternate host plants Biology information of FAW to crops Management protocol for FAW People ServicesAt least three (3) undergraduate Two (2) graduate students Places and PartnershipsPartnership with NCPC and BPI PolicyPolicy on management of FAW	UPLB	1. Corn Growers 2. Researchers/ Breeders 3. Agricultural Technicians 4. R&D planners, researchers, policy makers	1-Feb-20	31-Jan-22	ONGOING	4,986,964	1,458,617
	Enhancement of the Field Assessment Protocols and Suitability Maps for Coconut	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	In the recent passing of the Coconut Farmers and Industry Trust Fund Act (RA 11524) which is meant to improve the lives of coconut farmers and modernize the coconut industry, there is an urgent need to revisit and update the coconut crop suitability with special emphasis on the high-yielding hybrid varieties for massive propagation. Generation of area-specific suitability maps through the utilization of Geographic Information System (GIS) will enable various stakeholders in the data-driven utilization, decision making, and policy formulation.	1.Identified the baseline information and areas essential for the updating of coconut suitability maps; 2.Determined and ranked data requirements for coconut suitability based on priority; 3.Established database of essential data on (1) coconut, (2) soil, (3) climate, (4) thematic map, and (5) coconut performance; 4.Optimized field evaluation protocol for on-farm coconut hybridization; and, 5.Crafted atlas of coconut suitability (National, Regional, Provincial, Municipal, Barangay levels).	PCA	Coconut Farmers, Extension and Field Workers, Researchers, SUCs, Academes, Planners (CFIDP writers, LGUs), Policy Makers, Industry, and other stakeholders.	1-Aug-21	31-Oct-21	COMPLETED	2,693,236	2,693,236
	Establishment of Ten Hectares Abaca Hybrid Plantation at VSU and Evaluation of Fiber Quality for the Pulp Industry	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	The project will produce and grow abaca hybrid seedlings on a large scale basis at VSU to produce 5-10 tons of fibers for testing at SPMI. This will be done to validate the pulping and fiber characteristics for pulp and paper industry.	Establishment of 10 ha area for the abaca hybrids; 2. Production of 16,000 abaca hybrid seedlings for the 10 ha area; 3. Assessment and evaluation of the abaca hybrids as to their fiber quality/pulping characteristics	VSU	â€Farmers/Farmer Cooperatives â€CNursery Operators â€Local Government Units â€Abaca Processor	1-Nov-16	31-Oct-21	COMPLETED	4,893,698	895,551
	Fruit Quality Improvement in Carabao Mango through Quantitative Trait Loci (QTL) Identification for Scab and Stem-end Rot Resistance by Genotyping-By-Sequencing (GBS) and Genome Wide Association Studies (GWAS)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Mango is one of the important plantation fruit crops in the Philippines for local consumption and export. The Philippines is one of the major mango producers in the world with a total export of fresh mango of about 800,551 tons (FAOSTAT- 2014). â€˜Carabaoâ€™ mango is the most popular and prime export variety, which is acknowledged as one of the best mangoes in the world. On the other hand, mango production and quality in the country is constrained by several factors which include pests and diseases. Anthracnose, stem-end rot and scab are the most serious and destructive diseases of mango in the Philippines affecting fruit quality and yield. Stemend rot, caused by fungi Cytosphaera mangiferae, Dothiorella dominicana, Botryodiplodia theobromae and Lasiodiplodia theobromae, is considered a major problem limiting the storage and shelf life of mango fruits. The lesions develop slowly and in advanced cases, fruiting bodies may appear at the stem end. Mango scab is caused by the fungal pathogen, ElsinoÃ« mangiferae, which is also known as Denticularia mangiferae or Sphaceloma mangiferae. Losses due to scab disease was estimated to be 20% of the production (Nishijima, 1993). The disease is initially present as small dark brown or gray spots on the underside of leaves or fruit. These spots enlarge and darken over time and develops in young and mature fruits, twigs, leaves, and blossom spikes. Thus, there is a need to identify sources of resistance in mango germplasm that can be used in â€˜Carabaoâ€™ mango improvement. Conventional plant breeding in perennial crops such as mango requires a significant amount of time for the selection and evaluation of desirable traits over many generations. Marker-assisted selection (MAS) (Tester and Langridge, 2010) provides a more accurate and faster approach to select the desired phenotypes in a breeding population. The use of genetic approaches to detect and analyze the genetic variations associated with phenotypic differences has greatly facilitated the improvement of agronomic traits, which are mostly quantitative. The emergence of	Products (10)â€COne (1) GBS database for stem-end rot resistance in mango â€COne (1) GBS database for scab resistance in mango â€CAt least eight (8) molecular markers for scab and stem-end rot resistance in mango People Services (12)â€CTen (10) trained personnel â€CTwo (2) MS Plant Breeding/Biology/Plant Pathology Students Places and Partnerships (2) â€CPartnership with University of the Philippines Los BaÃ±os (UPLB) â€CPartnership with Bureau of Plant Industry-Guimaras National Crop Research, Development and Production Support Center (BPI-GNCRDPSC) Publications (4)â€CTwo (2) papers for publication â€CTwo (2) scientific paper presentations Patents (2)â€COne (1) molecular marker kit for scab resistance â€COne (1) molecular marker kit for stem-end rot resistance	USM	1.Mango growers and producers 2.Nursery owners 3.Researchers and plant breeders 4.Undergraduate and graduate students 5.Universities and research institutes	1-Jul-20	30-Jun-23	ONGOING	11,875,045	4,527,025
	Full Genome Sequencing of Selected Philippine Mango Species (Old Title: Full Genome Sequencing of Selected Philippine Mango Cultivars)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	The sequencing of mango genome will serve as a tool in future in providing information for breeding and research tools for mango farmers.	Products (5):â€C3 Mangifera genomes (M. indica L. cv. â€˜Carabaoâ€™, M. attisima and M. odorata) â€C1 online database with annotated SNPs for marker design â€C1 bioinformatics pipeline suitable for mango genome complexity People Services (3):â€CAt least 1 MS student and 1 BS student â€C1 Project Staff trained on data management Publications (1): â€CAt least 1 article in refereed and ISI journal Patents:â€C1-2 SNP markers	UPLB	1. Researchers 2. Breeders 3. Students	1-Jun-20	31-May-23	ONGOING	7,799,208	2,224,007
	Genetic Structure and Morphological Variation Analyses of the Fall Armyworm, Spodoptera frugiperda (J.E. Smith) (Lepidoptera: Noctuidae) in the Philippines	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Recently, genetic comparison studies revealed a novel interstrain hybrid population of uncertain behavioral characteristics of the African FAW population (Nagoshi et al., 2019), indicating that host plant and plant utility is not a determinant for the identity of the colonizing strain. Thus, genetic analyses using molecular markers are necessary to design an efficient pest management strategy for S. frugiperda to prevent the occurrence of outbreaks in the Philippines. Molecular data are also necessary for the genetic characterization to identify strains and haplotypes, estimate the genetic structure and study the population structure of the Philippine populations of this invasive insect pest. These basic information are valuable in the establishment of monitoring (Cock et al., 2017) and forecasting systems (Salinas-Hernandez and Saldamando-Benjumea, 2011), determination of source of invasion (Lui et al., 2019), Nagoshi et al., 2019), migration behavior (Nagoshi et al., 2008; Nagoshi et al., 2015; Nagoshi et al., 2018), distribution (Kuate et al., 2019), infestation levels (Nagoshi et al., 2012), susceptibility to insecticides (Storer et al., 2010), avoidance of the development of resistance to insecticides (Zhu et al., 2015), Bt crystal proteins (Cano-Calle et al., 2015), and Bt corn events (Niu et al., 2016). Furthermore, as the three final instars of FAW exhibit varying color patterns depending on the diet other factors (Hardke et al., 2015), a morphological-based identification key, in agreement with the molecular data that will be obtained in this study that correspond to the two strains, will also be developed in this study to facilitate the rapid FAW identification in the field.	â€CSpecimen for morphological and molecular analyses â€CMorphological description of the identified strains/haplotypes â€CIdentified FAW strains and haplotypes in the 5 major-corn producing areas â€CAmplicons of genetic markers for nucleotide sequencing â€CNucleotide and amino acid sequences deposited in the GenBank â€CGlobal FAW phylogenetic tree â€CNucleotide and haplotype diversity or polymorphisms, sequence variations data Geographical map	UPLB	1. Corn & rice farmers & other agricultural sectors 2. Researchers/ Breeders 3. Agricultural Technicians 4. R&D planners, researchers, policy makers	1-Feb-20	31-Jan-22	ONGOING	4,999,999	1,601,843

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
	Identification and Preliminary Evaluation of Natural Enemies Against the Fall Armyworm, Spodoptera frugiperda (J. E. Smith) (Lepidoptera: Noctuidae), in the Philippines	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Natural enemies associated with fall armyworm have recorded including parasitoids such as Trichogramma pretiosum in Brazil (Figueiredo et al 2015), Chelonus insularis in Mexico (Ríos-Velasco 2011), Aleiodes laphygmae and Campoletis sonorensis in Honduras (Wyckhuys and Ó€™Neil 2006), Telenomus remus in Africa (Kenis et al 2019), Apanteles sp in Costa Rica (Schmidt-Duran et al 2014), Cotesia icipe in Ethiopia and Paleorista zonata in Kenya (Sisay et al 2018). Predators like earwigs and ground beetles are reported to be associated with lower fall armyworm population throughout the corn season in Honduras (Wyckhuys and Ó€™Neil 2006). In the Philippines, initial field surveys indicated the presence of local natural enemies associated with fall armyworm - two species of hymenopterous parasitoids and one species of parasitic nematode (MVNavasero, personal communication, 2019). Based on the reported damage caused by the pest, the country has to be ready on the occurrence of any devastation caused by FAW. Measures for long term control should be prepared such as the use of existing biological control agents that poses less hazard in the environment. Augmentation of these biocon agents in the field could help reduce FAW population. This proposal aims to collect, identify and evaluate the effectiveness of biocon agents against fall armyworm in selected corn growing regions.	‚€Percent (%) field parasitism and predation by natural enemies on fall armyworm ‚€Identified 1 or 2 potential predatory pentatomoids and ladybeetles against FAW based on effectiveness parameters. ‚€Identified 1 or 2 potential Trichogramma, earwigs and green lacewings based on effectiveness parameters	UPLB	1. Corn Growers 2. Researchers/ Breeders 3. Agricultural Technicians 4. R&D planners, researchers, policy makers	1-Feb-20	31-Jan-22	ONGOING	5,000,000	1,526,286
	Increasing Heirloom Rice Production through Culturally Acceptable Management Options in Benguet and Mountain Province	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Traditional/Heirloom rice has superior eating quality. Over the years, it has been tested to be adapted and resistant to more destructive pests that are observed in high yielding varieties (HYV€™s) and requires low production input and management. Since heirloom rice is gaining its momentum in the international market, there is a need to increase the yield of traditional varieties to cater to the local and global market. Practices that can increase yield should be culturally acceptable. Culturally acceptable management practices are those technologies that can be followed by the community which do not affect their farming practices. These practices are considered traditional or the non-application of synthetic fertilizer and chemicals. One of the practices is the application of organic fertilizers. Pest control practices include the use of traditional methods such as scarecrows for birds and rat traps. There is no application of synthetic chemicals for insect and disease control. Information on the performance of rice landraces and their response to organic production practices is scarce; hence, the need to evaluate the best rice landrace and finally recommend under local conditions. Simultaneous with evaluation is the management of the soil fertility and pests to attain optimum yield and maximize production.	Publications-Publishable scientific articles for submission to Clavirate/Scopus indexed Journals or peer reviewed journals; IECs (Technoguide on Heirloom Rice Production) Patents and Copyrights-Patent is not applicable in this study, however, a copyrighted technoguide, ‚€œHeirloom Rice Production in CAR‚€ will be published Products-Seeds of promising rice landraces with market potential; Increased productivity of selected rice land races with market potential per location; Cost analysis resulting from best management practice Package of technology (POT) for heirloom rice People and Services-Training on heirloom rice production Places and Partnership-i, Signing of Memorandum of Agreement/Understanding between collaborating agencies: 1. LGU Kapangan 2. LGU Bauko 3. MPSPC	BSU	Heirloom farmers/growers, Researchers and Agricultural Extension Workers (AEWs), Agri-entrepreneur /seed producers, Consumers, Students	1-Jan-20	31-Dec-21	ONGOING	4,988,421	1,732,205
	Insecticide Management and Susceptibility Studies on Fall Armyworm, Spodoptera frugiperda (J.E. Smith) (Lepidoptera: Noctuidae)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Natural enemies associated with fall armyworm have recorded including parasitoids such as Trichogramma pretiosum in Brazil (Figueiredo et al 2015), Chelonus insularis in Mexico (Ríos-Velasco 2011), Aleiodes laphygmae and Campoletis sonorensis in Honduras (Wyckhuys and Ó€™Neil 2006), Telenomus remus in Africa (Kenis et al 2019), Apanteles sp in Costa Rica (Schmidt-Duran et al 2014), Cotesia icipe in Ethiopia and Paleorista zonata in Kenya (Sisay et al 2018). Predators like earwigs and ground beetles are reported to be associated with lower fall armyworm population throughout the corn season in Honduras (Wyckhuys and Ó€™Neil 2006). In the Philippines, initial field surveys indicated the presence of local natural enemies associated with fall armyworm - two species of hymenopterous parasitoids and one species of parasitic nematode (MVNavasero, personal communication, 2019). Based on the reported damage caused by the pest, the country has to be ready on the occurrence of any devastation caused by FAW. Measures for long term control should be prepared such as the use of existing biological control agents that poses less hazard in the environment. Augmentation of these biocon agents in the field could help reduce FAW population. This proposal aims to collect, identify and evaluate the effectiveness of biocon agents against fall armyworm in selected corn growing regions.	‚€Percent (%) field parasitism and predation by natural enemies on fall armyworm ‚€Identified 1 or 2 potential predatory pentatomoids and ladybeetles against FAW based on effectiveness parameters. ‚€Identified 1 or 2 potential Trichogramma, earwigs and green lacewings based on effectiveness parameters.	UPLB	1. Corn Growers 2. Researchers/ Breeders 3. Agricultural Technicians 4. R&D planners, researchers, policy makers	1-Feb-20	31-Jan-22	ONGOING	4,996,412	1,539,005
	Molecular Marker Assisted Breeding of Sweetpotato Varieties for High Beta-carotene, Anthocyanin and Resistance to Sweetpotato Feathery Mottle Virus (SPFMV) (Old Title: Molecular Marker Assisted Search for High Betacarotene, Anthocyanin and Resistance to Sweetpotato Feathery Mottle Virus (SPFMV) in Sweetpotato Germplasm and their Introgression to Sweetpotato Breeding Program)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	The role of sweetpotato as a major food and feed source for developing countries is unquestioned. In 2017, the country‚€™s total planted area is 84,974 ha producing around 537,303 metric tons (MT) with a value of 8.5 billion pesos. In addition, sweetpotato is cultivated throughout the country wherein commercial farms are located in Central and Western Luzon where it is grown after rice. When contrasted with other major staple food crops, sweetpotato has a diverse range of positive attributes: such as high yield (kg/ha/day), nutritional value, production geography, short production cycle and resistance to production stresses (e.g. high temperature, water deficit, insect and disease pressure, low fertility), making it not only an excellent source of food but a food that is nutritionally superior to most staples. Sweetpotato is now grown in more than 100 developing countries than any other root or tuber crop. Furthermore, it is becoming more and more apparent that sweetpotato is also a healthy choice for rural populations in developing countries. Not only does it produce more edible energy (carbohydrates) per hectare per day than wheat, rice or cassava, but the right varieties can also provide carotene to adults and children, that can be converted to Vitamin A in the body. Some varieties have enough carotene to ward off the severe effects of Vitamin A deficiency, especially in children and lactating mothers. The purple-fleshed varieties, on the other, are rich in anthocyanins that have antioxidant abilities and are being studied for their anticancer property, as well as, antidiabetic potential. Sweetpotato can be prepared in many different and interesting ways, including cooking the fresh roots and leaves, or processing into animal feed, starch, flour, candy, and alcohol. It can be used as a substitute for wheat in breads and cereals, and can be made into as many tasty and nutritious items as one can imagine. For a successful sweetpotato production program a tested technology package, which includes genetically superior varieties with wide genetic background and high quality planting materials, has to reach commercial growers. The Institute of Plant Breeding as a national center for crop improvement research and development, alongside with PhilRootCrops as the center for Root Crops research and development, seek to address this concern. At present, the Institute of Plant Breeding-National Plant Genetic Laboratory (NPGRL), UPLB and the PhilRootCrops of Visayas State University is maintaining the sweetpotato collection in pots and in the field. However, clonal maintenance of sweetpotato collections requires a periodic multiplication that could be done once or twice a year, depending on the environmental conditions prevailing in the area where the collections are located. In some areas, sweetpotato field genebanks are grown during the summer and the storage roots are kept in storage rooms during the cold season. The collection is then grown from stem cuttings produced from storage roots that are planted in sprouting beds. The maintenance of a field genebank is expensive and it is exposed to a series of diseases and pests, droughts, excessive rains, etc. A common problem in most countries that still maintain sweetpotato collections is the gradual loss of accessions in the field genebanks. Genetic losses in field	Products L§150 accessions of sweetpotato collected and characterized (morphological and molecular) L§Database of characterized Philippine sweetpotato germplasm L§150 Molecular fingerprints of different accessions of sweetpotato L§10 promising hybrids with improved beta-carotene and anthocyanin, and resistance to SPFMV L§Planting materials of 10 superior promising lines for distribution to growers, researchers, and other interested end-users Publication L§An IEC material for management and disease screening of SPFMV disease. L§Publications (atleast 2) People Services L§1 BS, 1 MSc, and 1 PhD students; atleast 20 trainees Places and Partnership L§PhilRootCrops and CIP	UPLB	Sweetpotato farmers/growers, bio-fuel manufacturers/processors, stakeholder, researchers	0-Jan-00	31-Mar-23	ONGOING	10,292,352	1,473,517
	Mutation Breeding in Alocasia (Araceae) and other Aroids through Gamma Irradiation and Chemical Treatments (Colchicine, Oryzalin, and/or EMS)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Development of new or improved varieties of Alocasia and other aroids through gamma irradiation and chemical mutagen	1. Selection of Philippine Alocasia and other aroids with potential as ornamental plants 2. Putative Alocasia mutants with improved horticultural characteristics (variation in leaf color/variegation, size and shape, exotic form and texture, compact habit for indoor/pot plants, higher suckering ability, hardiness and adaptability). 3. Publications on genetic diversity, radiosensitivity study, tissue culture, and mutation induction of Alocasia species and other members of Araceae	PNRI, DLSU-Dasmariñas	Agriculture/ornamental industry, private nurseries and plant exporters; plant breeders/researchers	1-Jan-19	30-Jun-21	COMPLETED	5,000,000	1,412,264
	Performance Evaluation of the 2-PRONGED Coconut Hybridization Scheme in CALABARZON	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	The project will be guided by known breeders from PCA-ZRC who has developed the coconut hybrids with identified uses (for VCO and for cocosugar production). Training on pollination shall be done at PCA-ZRC to capacitate the technicians at PCA-Region IVA. This will actually be the first activity for the On-Farm Hybridization Modality which can be emulated by other coconut growing region nationwide for PCA‚€™s Accelerated Planting and Replanting Program	1. Identified 2 project sites in Quezon for the conduct of AHS and established 3 farms in Quezon, Laguna, and Batangas for DNHS; 2. Established 3 hybrid nurseries for AHS and distributed hybrid seedlings for ACPRP in CALABARZON; 3. Established field-planted DNHS parental trees and adopt Good Agricultural Practices for management of DNHS farms; 4. Evaluated field performance of the parent materials for DNHS and conducted hybridity testing for selected mother trees; and, 5. Produced hybrid seednuts in AHS project sites, - 76,800 hybrid nuts/year to be planted in 500 ha in Quezon; - 384,000 hybrid nuts within 5 years to be planted in CALABARZON.	PCA-IVA	The project will benefit coconut farmers, as well as stakeholders and processors.	1-May-18	30-Apr-22	ONGOING	4,981,298	1,029,702

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
	Physicochemical Analysis and Fiber Tensile Strength Evaluation of Different Varieties of Abaca (Musa textilis Nee) in the Philippines	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Abaca is a kind of fiber with good tensile properties, which supported by the architecture of cell walls. It contains water (1.4%), lipid and cuticula (0.2-3%), pectin (0.5-1%), lignin (5-13%), hemicellulose (19-25%) and cellulose (56-68%). Cellulose micro fibril in banana have a big responsibility to the high value of tensile strength (600 MPa) Cellulose is one of organic compound that abundance around of our life. Biocompatibility and biodegradable are the most importance properties of cellulose, that make cellulose to be an importance material. Among of environment problem in the world, even in Indonesia, the main problem that faced by the government is undegradable of plastic packaging. One solution that has been offered is the utilized of biocomposite materials as an alternative material. Musa textilis has a big potential for the development of end products with high economic value, i.e. biocomposite packaging that able to degrade by bioprocess.	Tensile strength data of different abaca varieties Chemical analysis of fibers of different abaca varieties At least 1 publication in ISI journal 1 BS and 1 MS/PhD Student	UPLB	Abaca farmers, processors, researchers, and as well as other industry stakeholders	1-Jul-21	30-Jun-22	ONGOING	2,234,631	2,234,631
	Production of Quality Planting Materials of Laguna Tall, Tacunan Dwarf and Tacunan Dwarf x Tagnanan Tall Coconut Varieties Through Coconut Somatic Embryogenesis Technology (CSet)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Coconut production in the country has declined because majority of our coconut palms are now becoming too old for optimal fruit production and are being affected by a number of new devastating pests and diseases. To meet the enormous challenge of replanting at the shortest time possible, the identification and production of superior planting materials have to be fast-tracked. The Coconut Somatic Embryogenesis technology (CSet) is based on the production and multiplication of embryogenic callus induced, for instance, from plumular tissues of zygotic embryos. From one explant, it is possible to obtain tens of thousands of somatic embryos and depending on genotype, 20-60% of them converting to plantlets. The recently concluded Coconut Program titled â€œReinvigorating the Philippine Coconut Industry through the Coconut Somatic Embryogenesis Technology (CSet)â€, which was funded by DOST-PCAARRD, was an attempt to mass produce elite types of coconut using plumule explants primarily to establish new planting in coastal zones and replant the typhoon-damaged, and coconut scale insect-infested palms. It also aims to advance the agricultural biotechnology capability in the Philippines on the rapid mass propagation of coconut planting materials. However, varying degrees of success in producing somatic plants ready for field-planting were obtained by the different participating tissue culture laboratories of the component projects. For instance, the laboratories at BIOTECH and ICrop5 in UP Los BaÑos that have produced more than 60,000 somatic embryos at the end of the 5-year program are maintaining only 1,081 shootlets and plantlets in vitro (as of September 2019), which still need some time in the laboratory for them to complete its development and become ready for ex vitro establishment, hence, this proposal.	Produce approximately 33,000 somatic embryo cultures in vitro and 500 plumule-derived ex vitro established plantlets in the screenhouse of Laguna Tall (LAGT), Tacunan Dwarf (TACD) and Tacunan Dwarf x Tagnanan Tall (TACDxTAGT) coconut varieties.	UPLB	The major beneficiaries are the coconut growers in selected areas in CALABARZON who are dependent on coconut farming as their livelihood.	1-Mar-20	28-Feb-21	COMPLETED	2,500,000	795,652
	Production of Quality Planting Materials of Tagnanan Tall, Bago Oshiro Tall and Tacunan Dwarf Coconut Varieties Through Coconut Somatic Embryogenesis Technology (CSet)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	The coconut is an important crop grown in 68 out of 81 provinces in the Philippines. About 26% of the countryâ€™s agricultural lands is grown to coconuts. Yet, most coconut farmers live below the poverty line. This is due to the low nut yields that could be attributed to poor cultural practices such as little or no fertilization, inferior planting materials, limited sources of tree stocks, occurrence of pests and diseases, and natural calamities such as typhoons. The proposed project aims to provide an additional source of high-quality coconut planting materials through somatic embryogenesis, a non-traditional propagation method. The recently concluded Coconut Program titled â€œReinvigorating the Philippine Coconut Industry through the Coconut Somatic Embryogenesis Technology (CSet)â€, which was funded by DOST-PCAARRD, was an attempt to mass produce elite types of coconut using plumule explants primarily to establish new planting in coastal zones and replant the typhoon-damaged, and coconut scale insect-infested palms. It also aims to advance the agricultural biotechnology capability in the Philippines on the rapid mass propagation of coconut planting materials. However, varying degrees of success in producing somatic plants ready for field-planting were obtained by the different participating tissue culture laboratories of the component projects. For instance, the laboratory at UP Mindanao that have produced more than 60,000 calloid cultures and around 3,500 somatic embryos at the end of the 5-year program (as of September 2019). These cultures still need some time in the laboratory for them to complete its development and become ready for ex vitro establishment, hence, this proposal	The project is expected to produce approximately 20,000 somatic embryo cultures in vitro and at least 1,000 plumule-derived regenerants (shootlets and plantlets) of Tagnanan Tall (TAGT), Bago Oshiro Tall (BAOT) and Tacunan Dwarf (TACD) coconut varieties.	UPMin	The major beneficiaries are the coconut growers in selected areas of Davao Oriental and Davao del Norte who are dependent on coconut farming as their livelihood.	1-Mar-20	28-Feb-22	ONGOING	5,000,000	2,008,423
	Propagation of Quality Planting Materials of Baybay Tall (BAYT) and Selected Dwarf and Hybrid Coconut Varieties through Coconut Somatic Embryogenesis Technology (CSet)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	In 2015, a coconut research program titled, â€œReinvigorating the Philippine Coconut Industry through the Coconut Somatic Embryogenesis Technology (CSet)â€ was implemented through the rasearch funding of DOST-PCAARRD. This was a collaborative undertaking of several tissue culture laboratories situated in various regions of the country, namely VSU, BUCAF, PCA-ARC, PCA-ZRC, UPLB, and UPMin. The program was aimed to mass propagate plumule-derived coconut planting materials primarily to establish new planting in coastal zones and replant the typhoon-damaged, and coconut scale insect- infested palms. It also aimed to advance the agricultural biotechnology capability in the Philippines on the rapid mass propagation of coconut planting materials. The enhanced protocol for the coconut somatic embryogenesis technology (CSet) of the Philippine Coconut Authority â€" Albay Research Center (PCA-ARC) was adopted by all seven (7) participating CSet laboratories with the goal of enhancing the mass production of high yielding coconut varieties and hybrids. The adoption of the protocol was supervised and coordinated by expert from PCA-ARC. Likewise, during the first phase of the project implementation, the program enhanced the capability of laboratory personnel, specifically at the VSU Coconut Tissue Culture Laboratory (CTCL), on rapid production of quality planting materials of selected tall, dwarf and hybrid coconut varieties through CSet for the benefit of coconut farmers in selected coastal areas of Regions VI, VII, and VIII. It is very remarkable to note that the enhanced PCA-ARC CSet protocol was successfully adopted among partner laboratories and significant outputs were obtained despite unforeseen problems along the way, especially on the final step of the protocol on plantlet production. Solutions to address this major concern were explored so that optimization and enhancement of the protocol will be achieved. The VSU CTCL has endeavored to produce its first sets of plantlets. Currently, there are a number of existing advanced cultures that are maintained that would produce more plantlets.	â€CProduced approximately 23,000 somatic embryo cultures, 8,000 regenerants (shootlets and plantlets) in vitro and at least 1,000 plumule-derived ex vitro established plantlets in the screenhouse of Baybay Tall (BAYT), Laguna Tall (LAGT), San Isidro Dwarf (SNID), Tacunan Dwarf (TACD), and Malayan Red Dwarf x Tagnanan Tall (MRDxTAGT) coconut varieties. â€CDeveloped enhanced nursery management protocols for somatic plantlets â€CConsolidated growth performance data and identified characteristics of CSet-derived plantlets in nursery condition, and made recommendations for field planting based on observed data. â€CPrepared and submitted quarterly, midyear and annual project reports.	VSU	The major beneficiaries are the coconut growers in selected areas in Leyte, Eastern Samar, Bohol, Cebu, Siquijor, Iloilo and Negros Oriental who are dependent on coconut farming as their livelihood.	1-Jun-20	31-May-22	ONGOING	3,745,400	924,141
	Propagation of Quality Planting Materials of Selected Tall, Dwarf and Hybrid Coconut Varieties through Coconut Somatic Embryogenesis Technology (CSet)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Coconut is considered as the Philippinesâ€™ top agricultural export, wherein 3.5% of the Gross National Income and Gross Domestic Product of the agricultural sector is contributed by the coconut industry. The import commodity value of traditional and non-traditional coconut export products is $260M (PCA, 2017). However, the industry faces problems among which are low productivity due to old and senile palms, natural calamities like typhoon and coconut scale insect (CSI) infestation. To address the issue, mass propagation of coconut planting materials is being done. The Traditional method of coconut mass production is through seednut raised in nursery and seedbeds, or through embryo culture. Mass propagation of high-yielding coconut variety/hybrids using somatic embryogenesis can contribute to substantial improvement (Chan et. al., 1998) in the productivity of plantations. Coconut tissue culture has been on-going at Philippine Coconut Authority-Albay Research Center (PCA-ARC) for the past three (3) decades. Different coconut explants are being used like immature flowers, embryos and leaf, anther, ovary and plumule. Plumule was found to be the most responsive. Plumule-derived coconut palms at PCA-ARC are now at vegetative and bearing stages. As of January 31, 2020, Project 4 (PCA-ARC) of the completed CSet Program is maintaining a total of 108,316 calloids (CD), 8,281 somatic embryos (SE), 1,046 shootlets, 202 plantlets and 42 ex vitro established plantlets from 10 coconut varieties via primary somatic embryogenesis. With the aim to increase the regeneration efficiency of the CSet protocol, secondary somatic embryogenesis pathway has been considered. The group of Centre de Investigacion Cientifica de Yucatan (CICY) Mexico has been successful in micropropagation of coconut via secondary somatic embryogenesis enabling them to regenerate 13,000 embryogenic calloids and 98,000 somatic embryos per single plumule. About 35,000 and 50,000-fold increase in calloid and somatic embryo formation, respectively, was noted compared to the yield obtained from primary somatic embryogenesis (Perez-NuÑez et al., 2006). The secondary somatic embryos (SSE) was noted to mature fast and germinate easily, thereby ensuring the increased number of plantlets obtained. Using both primary and secondary somatic embryogenesis with primary somatic embryos, these two (2) practices will produce an enormous number of regenerants. Current undertakings using the available plumule-derived somatic embryos at PCA-ARC showed that one (1) SE was able to produce 5,500 CD, 2,508 SE and 1,495 regenerants composed of 1,360 shootlets and 135 plantlets from one (1) SE of cv. Baybay Tall (BAYT). Regenerants were obtained 10 months after initial transfer to the regeneration medium. The use of SE to induce secondary calloids and eventually somatic embryogenesis and plantlet has to be further explored and verified using other varieties in order to prove the efficiency of the secondary somatic embryogenesis pathway which will eventually hasten and increase the number of SE and regenerants produced.	With the projected 40% regeneration efficiency of the PCA-ARC CSet Protocol using the secondary somatic embryogenesis, the project is expected to produce approximately 50,000 somatic embryo cultures in vitro, at least 5,000 regenerants (shootlets and plantlets) in vitro and approximately 2,500 ex vitro established plantlets in the screenhouse of selected four (4) Tall, three (3) Dwarf and three (3) Hybrid coconut varieties.	PCA-ARC	The major beneficiaries are the coconut growers in selected areas in Albay, Camarines Sur and Masbate who are dependent on coconut farming as their livelihood.	16-Dec-20	15-Dec-22	ONGOING	5,000,000	1,668,232

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
	Propagation of Quality Planting Materials of Tagnanan Tall (TAGT) and Laguna Tall (LAGT) Coconut Varieties through Coconut Somatic Embryogenesis Technology (CSet)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Coconut (Cocos nucifera L.), tagged as the Tree of Life, is a very important agricultural export crop of the Philippines. Unfortunately, the coconut industry faces many problems including the low productivity due to palm diseases and existing old and senile coconut stands, and increasing demand for coconut products. On the other hand, markets for coconut products have been rapidly growing in recent years. Thus, there is a need to replace the senile and infested coconut stands as well as expand planting in coastal areas. However, the replanting and expansion in coastal areas would require sufficient number of planting materials. At present, coconut seedlings are produced in the country through seed embryo. Propagation through seed is highly variable and quite slow since only one plant can be obtained from one seed. Mass propagation technique of quality high yielding coconut varieties through asexual propagation is an effective alternative to improve productivity and sustain viability of the Philippine coconut industry.	The project is expected to produce approximately 28,000 somatic embryo cultures and 8,000 regenerants (shootlets and plantlets) in vitro, and at least 1,800 plumule-derived ex vitro established plantlets in the screenhouse of Tagnanan Tall (TAGT) and Laguna Tall (LAGT).	BUCAF	The major beneficiaries are the coconut growers in selected areas of Camarines Norte, Catanduanes and Sorsogon who are dependent on coconut farming as their livelihood.	1-Jul-20	30-Jun-22	ONGOING	3,400,000	823,942
	Targeted Genome Editing using CRISPR-Cas9 Technology: Capacity Building and Proof-of-Concept in Rice, Corn, and Tomato (Old Title: Application of CRISPR-Cas9 Genome Editing Technology Towards Improvement of Economically Important Philippine Crops)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	The project aims to enhance human resource capacity and rehabilitate/upgrade physical facilities that will enable the conduct of R&D at UPLB using CRISPR-Cas9 technology on economically important Philippine crops. This research would be a partnership between the International Rice Research Institute (IRRI) and the University of the Philippines Los BaÃ±os (UPLB) through the Institute of Plant Breeding and Institute of Biological Sciences in cooperation with the Office of the Vice Chancellor for Research and Extension. IRRI has already been employing the CRISPR-Cas9 technology in rice breeding particularly on drought and salinity tolerance, C4 engineering and resistance to diseases caused by various pathogens. UPLB, on the other hand, has not yet started conducting research using CRISPRCas9. The primary hindrance is the lack of infrastructure to support experiments on this cutting-edge technology. Secondly, the human resources or â€œwarm bodies â€ lack the training and technical capabilities to conduct the experiments. With the technical expertise from IRRI, this project will build the necessary physical and human resource requirements that will allow UPLB to apply the CRISPR-Cas9 technology in the improvement of economically important Philippine crops particularly rice, white corn, and tomato.	Expected Output 1. Seminars, trainings and workshops on CRISPR-Cas9 for capacity-building of University faculty, staff and students 2. Trained faculty, research staff, and students capable of conducting researches on CRISPR-Cas9 3. Conduct proof-of-concept experiments on gene editing using CRISPR-on rice, corn, and tomato 4. Protocols for gene editing using CRISPR-Cas9 technology 5. At least two (2) publications in a peer-reviewed journal	UPLB	Target Beneficiaries â€ Molecular biologists and molecular breeders â€ Young professionals and student researchers	1-Jul-18	30-Jun-21	COMPLETED	40,550,717	5,177,368
	Upgrading the Coconut Industry through Precision Hybridization and Germplasm Characterization	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Coconut hybridization is the process of generating seedlings from two genetically different parents. By doing so, this takes advantage of hybrid vigor which is characterized by the exceptional performance of the generated progenies that far exceeds that of the parental genotypes. It is currently considered as an effective strategy in addressing the improvement of coconut production in the Philippines and other coconut producing countries. Aside from yield traits, phytochemicals in coconuts have the potential to confer value-added traits, however phytochemical characterization data on Philippine core cultivars are currently lacking. Coconut hybridization is conducted by controlled pollination, generally between tall and dwarf ecotypes. The resulting progenies often perform better than their parents and exhibit highly valued traits, such higher yield and pest/disease resistance, shorter duration of juvenility and environmental stress tolerance. Currently, there are efforts by the Philippine Coconut Authority (PCA) and other stakeholders to promote the use and development of coconut hybrids to improve the nationâ€™s coconut industry at a more competitive stance. Significantly, the national coconut hybridization program under the Coconut Farmers Industry Development Plan (CFIDP) was provided with the highest fund allocation from the Coco Levy Trust Fund as stipulated in RA 11524. At present, policy-making bodies in the Philippines do not utilize molecular markers as a way to certify seed farms/nurseries and validate hybrid seed nuts, however efforts are currently being made by the recently established National Seed Industry Council Technical Working Group (NSIC-TWG) for coconut in consultation to a spectrum of industry leaders, academe and stakeholders. Despite this, other agencies in the government and academe, such as the PCA and the Institute of Plant Breeding (IPB) - UP Los BaÃ±os, have been using simple sequence repeat (SSR) markers as a means to determine genetic purity and relative hybridity of seedlings. More modern approaches utilizing next-generation sequencing (NGS)	â€¢ Metrics Publications Patents Products 	UPLB	Outputs of this project ultimately benefits coconut farmers and other relevant stakeholders. In an attempt to streamline and further strengthen the coconut hybridity testing capabilities of the country, this in turn would also benefit coconut researchers and breeders, particularly in the selection process. Technologies developed from this project can also increase the throughput and robustness of seed certifying agencies should they opt to adopt these innovative strategies in coconut varietal testing.	16-Dec-21	15-Dec-24	ONGOING	28,512,440	17,454,147
Acclerated R&D Program for Capacity Building of Research and Development Institutions and Industrial Competitiveness: Niche Centers in the Regions for Research and Development (NICER)	DNA Barcoding for Molecular Identification of Endemic Flora for Sustainable Biodiversity Conservation in Cebu Island Key Biodiversity	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project will conduct DNA barcoding of selected endemic tree species in Cebu	1. Publications - Initial draft layouts of flyer, brochure and other IEC materials (50) (Y1); Two (2) peer-reviewed journal articles: at least 3 IEC materials (Guide Books for the genetic diversity and phylogenetic relationships of the endemic flora and flyers, brochures, posters, etc) (Y2). 2. Patents - Copyrights of the IEC materials, including guidebooks, brochures, leaflets, etc. (Y2). 3. Products - At least 10 copies of maps based on the georeference of collected plant samples; and â€œEstablished database for DNA barcodes on endemic flora (approx. 20 species) in Cebu Island KBAs (Y2) 4. People and Services - 5 trained research personnel/team members; and at least 40 forestry students will be trained for PCR and molecular identification of plants (Y1) 5. Places and Partnerships - MOA with selected stakeholders (LGUs, DENR, Academe) (Y1). 6. Policy - Final information for policy recommendations and reports for LGUs for sustainable genetic biodiversity conservation (Y2).	CTU	1. Local Government Unit (LGU) – the endemic species can be showcased in their eco â€" tourism to raise awareness of the richness of the biodiversity of the area. This can be an added attraction to the eco â€" tourism activity of the local government unit concerned. The result on DNA barcoding shall also enhance the policy of the LGUs that will promote the protection of the endemic flora. 2. Students – forestry and agriculture students of the Cebu Technological University will now have the opportunity to learn the importance of molecular systematics through DNA barcoding. Training on PCR will provide them the right exposure to this technology. 3. Scientific Community – the study on genetic diversity and population structure of endemic flora through DNA barcoding is an important platform that will encourage scientists such as biologists and ecologists and other allied sciences to understand its developmental biology and ecological function. The molecular sequences can also help build the genomics/ transcriptomics of the endemic flora which can give aid in evaluating the medicinal value of the species.	1-Jul-19	30-Jun-22	ONGOING	4,997,445	585,391
ACIAR	Enhancing Livelihoods through Forest and Landscape Restoration (ASEM/2016/103)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project will provide livelihood options to smallholders involved in forest restoration.	Livelihood options to smallholders through forest restoration	VSU	Tree farmers, LGUs, academe, researchers	1-Apr-19	31-Mar-23	ONGOING	3,996,800	785,034
Characterization and Performance of Ten (10) Promising Varieties of Cacao in Different Agro Climatic Zones in the Philippines	Proj. 1 Yield and Bean Quality Evaluation of Ten (10) Promising Cacao Varieties in Type II and Type III Agro Climatic Zones in Northern and Southern Mindanao	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The cocoa tree, Theobroma cacao L. is one of the very popular crop created a rapidly expanding market with a very high price stimulated production and export in all suitable islands. Technological improvements and emergence of new product like chocolate bar in the late 1800s created rapid increase and demand. In the Philippines, cacao flourished into an industry with 9% average growth rate in production (1977-1986) due to increase in production area i.e. from 4,400 hectares in 1977 to 15,230 hectares in 1986 with estimated production of 2,900 tons in 1977 to 6,240 tons in 1986. Ironically, as the Philippine Cacao Industry was starting to grow, the implementation of the Comprehensive Agrarian Reform in 1998 fragmented the well performing commercial cacao farm. The Philippine government realized the importance of cacao due to its high demand both in domestic and international markets. The current plan of the government and private sector to increase cacao production to 100,000MT in 2022 calls for a lot of planting materials (Philip-pine Cacao Industry Roadmap 2017-2022). This would mean a lot of hectarage to be planted from the current ~30,000 has. If we average 1 ton of beans/ha, then we need to plant 70,000 has more. Cacao production however, is beset with several problems like pests and diseases, poor cultural practices, and use of low yielding and poor quality planting materials. Several varieties which are of good quality (i.e. criollo) and promising in terms of yield (i.e. W10) are worthwhile to be tested for future use of our cacao farmers. Definitely, identification of well adapted varie-ties will benefit growers as the burden of trying out varieties will be lifted from the farmersâ€™ shoulders and definitely justifies the resources invested in it. The output will be varieties identi-fied to do well in a particular agro-climatic zone and can easily be disseminated by informing accredited nursery owners priority varieties to be propagated in each region and by providing them the mother plants as scion source. The output of this research will benefit the DA for its cacao expansion program, DAR ARBs and NGP of DENR. To date, cacao production is one of the researchable areas under ISP of PCAARRD through identification of superior varieties in terms of yield and its tolerance to pests and dis-eases adapted to specific locations. Moreover, production of good bean characteristics and their availability to local cacao growers appear to be the best short term- strategy to genetically improve cacao and ensure increased local productivity. Newly introduced clones from the in-ternational Cocoa Quarantine Center based at the University of Reading, UK and even local varieties represent potential source of desirable traits. Assessment of performance of promis-ing hybrids generated from local and introduced varieties in local conditions is a valuable step to determine their suitability for future genetic manipulation. Moreover, this research undertak-ing may lead to the identification of superior varieties of cacao for general and specific recommendation.	1. Selected 1 or 2 cacao varieties with outstanding performance adaptable to high, medium and low elevation. 2. Identified varieties for combined elevation and climatic type- with resistance to pest and diseases and high productivity level. 3. Production of IEC materials. 4. Partial budget analysis for multilocation cacao trials 5. Capacity building and dissemination of new technologies to farmers	USM, SASU, ASSCAT	The beneficiaries of the project primarily include nursery owners, cacao farmers, cacao plantation growers, cacao bean processors, cacao breeders, cacao industry, consumers and government agencies such as Bureau of Plant Industry	1-Jul-21	31-Dec-22	ONGOING	2,760,000	1,846,928

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
Characterization and Performance of Ten (10) Promising Varieties of Cacao in Different Agro Climatic Zones in the Philippines	Proj. 2 Yield and Bean Quality Evaluation of Ten (10) Promising Cacao Varieties in Type I and Type IV Agro Climatic Zones in Southeastern Mindanao, Visayas and Northern Luzon	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The cocoa tree, Theobroma cacao L. is one of the very popular crop created a rapidly expanding market with a very high price stimulated production and export in all suitable islands. Technological improvements and emergence of new product like chocolate bar in the late 1800s created rapid increase and demand. In the Philippines, cacao flourished into an industry with 9% average growth rate in production (1977-1986) due to increase in production area i.e. from 4,400 hectares in 1977 to 15,230 hectares in 1986 with estimated production of 2,900 tons in 1977 to 6,240 tons in 1986. Ironically, as the Philippine Cacao Industry was starting to grow, the implementation of the Comprehensive Agarian Reform in 1998 fragmented the well performing commercial cacao farm. The Philippine government realized the importance of cacao due to its high demand both in domestic and international markets. The current plan of the government and private sector to increase cacao production to 100,000MT in 2022 calls for a lot of planting materials (Philip-pine Cacao Industry Roadmap 2017-2022). This would mean a lot of hectarage to be planted from the current ~30,000 has. If we average 1 ton of beans/ha, then we need to plant 70,000 has more. Cacao production however, is beset with several problems like pests and diseases, poor cultural practices, and use of low yielding and poor quality planting materials. Several varieties which are of good quality (i.e. criollo) and promising in terms of yield (i.e. W10) are worthwhile to be tested for future use of our cacao farmers. Definitely, identification of well adapted varie-ties will benefit growers as the burden of trying out varieties will be lifted from the farmersâ€™ shoulders and definitely justifies the resources invested in it. The output will be varieties identi-fied to do well in a particular agro-climatic zone and can easily be disseminated by informing accredited nursery owners priority varieties to be propagated in each region and by providing them the mother plants as scion source. The output of this research will benefit the DA for its cacao expansion program, DAR ARBs and NGP of DENR. To date, cacao production is one of the researchable areas under ISP of PCAARRD through identification of superior varieties in terms of yield and its tolerance to pests and dis-eases adapted to specific locations. Moreover, production of good bean characteristics and their availability to local cacao growers appear to be the best short term- strategy to genetically improve cacao and ensure increased local productivity. Newly introduced clones from the In-ternational Cocoa Quarantine Center based at the University of Reading, UK and even local varieties represent potential source of desirable traits. Assessment of performance of promis-ing hybrids generated from local and introduced varieties in local conditions is a valuable step to determine their suitability for future genetic manipulation. Moreover, this research undertak-ing may lead to the identification of superior varieties of cacao for general and specific recommendation.	1. Selected 1 or 2 cacao varieties with outstanding performance adaptable to high, medium and low elevation. 2. Identified varieties for combined elevation and climatic type- with resistance to pest and diseases and high productivity level. 3. Production of IEC materials. 4. Partial budget analysis for multilocation cacao trials 5. Capacity building and dissemination of new technologies to farmers	DA XI, VSU, BSU	The beneficiaries of the project primarily include nursery owners, cacao farmers, cacao plantation growers, cacao bean processors, cacao breeders, cacao industry, consumers and government agencies such as Bureau of Plant Industry	1-Jul-21	31-Dec-22	ONGOING	2,240,000	1,479,872
Managing Cocoa Quality in the Post-Harvest Process: Biological Approaches for the Management of Mycotoxins and Storage Pests of Cacao	Proj. 2 Management of Storage Insect Pests and Mycotoxins of Cocoa Using Biological Control Approaches	KRA 3: Rapid, Inclusive and Sustained Economic Growth	After harvest, the cacao bean is fermented, dried, and stored. Farmers remain vulnerable to production losses during these processes and the quality and flavor of the product is defined by the environment and the methods used. Post-harvest processing falls upon the pillars of productivity and adaptation. Farmer incomes are dependent on the amount of cocoa beans they can sell and the success in post-harvest processing is dependent on the interaction between environmental factors (e.g. humidity) and factors related to the process (e.g. bacteria during fermentation). The last step in cocoa processing is storage of dried beans. During storage, beans are risk of damage in particular the presences of insect storage pests such as warehouse moths and red flout beetles. These insect pests of stored products have for long greatly depended on the use of synthetic insecticides and fumigants, which have multitudes of problems such as residues in products, and insecticide resistance. Thus, a big concern on food safety. Warranting the need to explore alternative method(s), which are bio-based. Losses from insect infestation in the postharvest facility is ranging from 5-30% and can reach 100% if left unattended especially when the beans become unfit for human and animal consumption due to increase Free Fatty Acid (FFA) content brought about by the after feeding effect of the storage insect pests. This proposed project under the cacao postharvest program will develop a biobased management system with innovative tools in controlling the population of storage insect pests on cocoa beans. Innovative tools include monitoring and control of insect pests through semiochemicals, the use of biological control agent(s), and particle film technology with entomopathogens as repellent and biocoater. This storage pest management system will serve as early detection and quick response to mitigate the effect of storage insect pests as well molds resulting to superior quality of cacao beans for local consumption and will increase competitiveness of the country in the international market.	6Ps Metrics Publications (no. of paper published/peer reviewed and IEC materials, citations) Year 1 â€¢ 1 publication Year 2 â€¢ 3 publications â€¢ Manuals, Guide, IEC materials for on-site detection (at least 3) Patents (no. of patents, IP filing) Patent application on the pest management tools Products (perceived future value, value of commercialized products) â€¢ Kairomone/pheromone trapping system â€¢ Biocoating agent People Services (no. of MS, PhD Graduated, no. of trained personnel, value of public service contributed) Year 1 â€¢ At least 2 graduate students (MS/PhD in Biology and Computer Science) Year 2 â€¢ Farmers (at least 25 for each location); Agricultural technicians (at least 2 for each partner agencies Places and Partnership (# of startups formed, MOA/MOU signed) â€¢ concerned agencies like LGUs, DA, and academic institutions and potential industry partner â€¢ Michigan State University Policies â€¢ Policy Learning is a prerequisite for adoption of new technologies and practices	DLSU	â€¢ Postharvest Facilities â€¢ Other Partners/Adaptors â€¢ Bureau of Plant Industries (Pest Clinic Laboratories) â€¢ Municipal Agricultural Offices â€¢ Farmers as identified by DA Regional Offices	1-Sep-21	31-Aug-23	ONGOING	6,742,532	2,344,391
Multilocation Trial of Ten (10) Promising Varieties of Cacao in Different Agro-Climatic Zones in the Philippines	Project 1. Evaluation and Characterization of Ten (10) Promising Varieties of Cacao in Type II and III Agro-climatic Zones in Northern and Southern Mindanao	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Cacao production is one of the researchable areas under ISP of PCAARRD through identification of superior varieties in terms of yield and its tolerance to pests and diseases adapted to specific locations. Moreover, production of good bean characteristics and their availability to local cacao growers appear to be the best short term- strategy to genetically improve cacao and ensure increase local productivity	Establishment of seven cacao demo farms in different locations; Initial data on agronomic characteristics of ten cacao varieties; Gather morphological data of ten cacao varieties, Assess occurrence of pests and diseases; Data on yield, horticultural characteristics, chemical analysis nutritional and sensory evaluation of ten cacao varieties; Recommendation of new varieties in different agro climatic zones; Dissemination of new technology to farmers	USM, SKSU, ASSCAT	Cacao farmers, researchers, investors, agriculture students and other cacao stakeholders.	16-Apr-18	15-Apr-21	COMPLETED	8,696,384	1,034,130
Multilocation Trial of Ten (10) Promising Varieties of Cacao in Different Agro-Climatic Zones in the Philippines	Project 2. Evaluation and Characterization of Ten (10) Promising Varieties of Cacao in Types I and II Agro-Climatic Zones in Luzon	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Cacao production is one of the researchable areas under ISP of PCAARRD through identification of superior varieties in terms of yield and its tolerance to pests and diseases adapted to specific locations. Moreover, production of good bean characteristics and their availability to local cacao growers appear to be the best short term- strategy to genetically improve cacao and ensure increase local productivity	Establishment of seven cacao demo farms in different locations; Initial data on agronomic characteristics of ten cacao varieties; Gather morphological data of ten cacao varieties, Assess occurrence of pests and diseases; Data on yield, horticultural characteristics, chemical analysis nutritional and sensory evaluation of ten cacao varieties; Recommendation of new varieties in different agro climatic zones; Dissemination of new technology to farmers	BSU, CBSUA	Cacao farmers, researchers, investors, agriculture students and other cacao stakeholders.	16-Apr-18	15-Apr-21	COMPLETED	4,651,808	234,503
Multilocation Trial of Ten (10) Promising Varieties of Cacao in Different Agro-Climatic Zones in the Philippines	Project 3. Evaluation and Characterization of Ten (10) Promising Varieties of Cacao in Types of IV Agro-Climatic Zones in Visayas and Southeastern Mindanao	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Cacao production is one of the researchable areas under ISP of PCAARRD through identification of superior varieties in terms of yield and its tolerance to pests and diseases adapted to specific locations. Moreover, production of good bean characteristics and their availability to local cacao growers appear to be the best short term- strategy to genetically improve cacao and ensure increase local productivity	Establishment of seven cacao demo farms in different locations; Initial data on agronomic characteristics of ten cacao varieties; Gather morphological data of ten cacao varieties, Assess occurrence of pests and diseases; Data on yield, horticultural characteristics, chemical analysis nutritional and sensory evaluation of ten cacao varieties; Recommendation of new varieties in different agro climatic zones; Dissemination of new technology to farmers	DA-RFU XI, VSU	Cacao farmers, researchers, investors, agriculture students and other cacao stakeholders.	16-Apr-18	15-Apr-21	COMPLETED	4,651,808	267,248
Phase 2 Cacao Pest Management Program: Biologically-based Approaches	Project 1. Pilot Testing of the Semiochemical Trapping System, Using Impregnated Sex Pheromone and Kairomone Lures for the Control of the Major Insect Pests of Cacao in the Philippines: Cacao Pod Borer and Cacao Mirid Bug	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Biological based approaches on solving the problem for infestation such as the Cacao Mirid Bug and the Cacao Pod Borer are currently being implemented. This is in response to the heavy reliance on pesticides despite the constant promotion of the practice of IPM. Phase 1 of the Cacao Pest Management Program successfully understood the mating behavior of the Cacao Pod Borer and the correct position of the sex pheromone traps, identified possible kairomone and sex pheromone compounds for the CMB and the mating behavior of CMB. With the accomplishments during Phase 1, validations of the technologies are done for full implementation. Once validation is complete, farmers and other target beneficiaries would be able to practice the biological based technology and enforce it on local cacao farms.	6 Ps deliverables: 1. Product - 1 bait/trap; 2. Patent - method of attracting using the developed formulation of the semiochemicals; 3. Publication - 2 publications (trap design and field testing of formulation); 4. People services - 2 graduate students (MS/PhD in Biology and Chemistry); 5.) Places and Partnerships - cacao growing areas in the Philippines; 6.) Policies - Bio-based control strategy as component for integrated pest management of the cacao pest.	DLSU	Cacao and coconut farmers, agricultural technicians, pest control companies and Cacao traders/processors/food and wellness markets.	1-Mar-20	28-Feb-22	ONGOING	6,022,450	2,275,787

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
Phase 2 Cacao Pest Management Program: Biologically-based Approaches	Project 2. Mass Rearing, Augmentation, and Conservation of the Biological Control Agents (BCAs): Lynx Spider, Oxyopes javanus, and Red Weaver Ant, Oecophylla smaragdina for the Management of Insect Pests of Cacao in the Philippines	KRA 3: Rapid, Inclusive and Sustained Economic Growth	In the 1970â€™s, cacao, Theobroma cacao L., was an important agricultural industry in the Philippines. But the industry declined precipitously in the late 1980â€™s due to the division of cacao estates as part of the land reform act of the Comprehensive Agarian Reform Program (Anonymous, 2008) and to increasing pressure from pests particularly from the cacao pod borer (CPB), Conopomorpha cramerella (Snellen). Currently, there is an on-going initiative in reviving the cacao industry in the Philippines, which is driven by the high international demand for cacao beans. Existing and prospective cacao farmers in the Philippines have guaranteed markets because of the increasing interest from the international buyers and grinders in Southeast Asia for Philippine grown cacao beans (Anonymous 2009). Current estimation of cacao produced in the Philippines is 12,000 metric tons (MT), which does not even satisfy the local market. It was projected through the Philippine Cacao Road Map crafted in 2006 by the Department of Agriculture and the Cocoa Foundation of the Philippines, Inc that the Philippines has the potential to produce 100,000 MT by 2020 and that the Philippines should take advantage of this business opportunity (Ng, 2008). The Philippines is also well placed as future suppliers of quality cacao beans for local, regional and international market catering for organic products. However, before the Philippines can take advantage of the good market for cacao and increase its competitiveness; farmers must aim to produce high quality beans through improvement of production management and post-harvest handling. One of the major constraints in cacao production is from insect pests. In the Philippines, among the most serious insect pests of cacao are the cacao pod borer and the cacao ehav bug (Espino& Ramos 2008, Cocoa Foundation of the Philippines 2009, PCAARRD 1989). The proposed project is focused on biological control technologies particularly the use of biological control agents directly associated with cacao ehav bug (CMB) and cacao pod borer (CPB). In particular, the project will develop the rearing system for two predators, Oxyopes javanus, a predatory spider, and Oecophylla smaragdina, a predatory ant, for augmentation release in cacao farms where pest pressure from CMB and CPB is very evident. These two predators were identified as the most dominant in the field surveys and showed direct association with CPB and CMB from the Phase 1 of the project. This project being proposed will determine the release strategy and conservation of the two predators in the field. This pest control technology will make a significant contribution to increase the production of quality cacao beans and thereby will be profitable for cacao farmers.	To develop efficient strategy in the use of biological control agents to manage the population of CPB and CMB	DLSU	Cacao and coconut farmers, agricultural technicians, biological control rearing facilities and cacao traders/processors/food and wellness markets	1-Mar-20	28-Feb-22	ONGOING	5,531,345	2,126,298
Phase 2 Cacao Pest Management Program: Biologically-based Approaches	Project 4. Particle Film Formulation with Biological Control Agents (BCAs) and Microbial Control Agents (MCAs) for the Control of the Insect Pests and Diseases of Cacao in the Philippines	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Particle film technology for arthropod pest control represents a combined knowledge of the benefits of reflected light, mineral barriers, and toxic properties of minerals. Key to this technology was the recognition that mineral particles can have significant effects on insect behavior that were not previously recognized (Glenn et al. 1999; Puterka 2000). Insects were agitated by particle film treated plants through contact with the film where particles attached to insects as well as having other effects on insect biology and behavior (Glenn et al. 1999; Puterka et al. 2000a,b,). Particle film research began in 1994 originally in an attempt to control fruit diseases with hydrophobic kaolin films. In field trials, it was quickly realized that hydrophobic films reduced insect damage, marking the beginning of the entomological research on particle film technology. Particle film technology was originally based on kaolin clay made hydrophobic by a silicone coating that was originally developed for disease control in tree fruits. Kaolin is known as non-chemical product with insect repellent property and included in the particle film technology for pest management program of many agricultural crops. Particle films like kaolin have been successfully used for insect and disease management in tree fruit and vegetable crops as well as landscape plants. All the particle films consist of small-sized mineral elements, which can affect insect behavior through contact with treated surfaces or by producing a highly reflective surface. Particle films action against insects may be lethal or nonlethal (i.e., repellency or avoidance of treated plants). Mortality results from ingestion of mineral particles, or desiccation through abrasion of the cuticle or adsorption by the cuticular waxes. Thus far, knowledge on the efficacy of kaolin against pests of cacao is very little. Amalin et al. (2015) reported positive repellency of cacao mirid bug on kaolin treated pods tested in the laboratory. This result warrants further study on this technology on cacao pests attacking pods aside from mirid bug.	1. Product - formulated particle film; 2. Patent - patent application for Zeolite as coating agent for pests repellency; 3. Publication - 2 publications (combined effect of particle film and BCA for insect pest management and for disease control); 4. People services - 2 graduate students and at least 50 trainees; 5. Places and partnerships - Nanobiotechnology Center, UP Los Banos, FNRI-DOST, Cocoa Foundation of the Philippines, CBSUA, SKSU, ISU, CSU, DA Regional Offices, DA Attached agencies and DA-LGU; 5. Policies - Biobased control strategy as component for integrated pest management of the cacao pest.	DLSU	Cacao and coconut farmers, agricultural technicians, pest control companies and cacao traders/processors/food and wellness markets.	1-Mar-20	28-Feb-22	ONGOING	4,727,335	2,135,668
	Assessment, Nutrient Profiling, and Propagation of Economically Important Terrestrial Snail Species in Selected Key Biodiversity Areas (KBAs) of Cebu Island, PhilippinesAn Alternative Food Source to Strengthen Food Security amidst Pandemic: Land Snail Farming and Nutrient Profiling of Economically Important Land Snail Species in Cebu Island, Philippines)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This study is in support of the NICER project of CTU-Argao Campus on biodiversity assessment of flora and fauna in Cebu Island KBAs. The NICER project on biodiversity assessment of flora and fauna in Cebu Island has led to the inventory of land snails diversity in the area. Land snails are essential both as bio indicator for rainforest biodiversity and health status of forest habitat. Its ecosystem services include breaking down and recycling of organic matter, transfer of calcium nutrient to higher trophic levels and as food source for other animals.	Year 1 People and services - at least 10 student mentored Places and Partnership - MOA with DA, DENR, Philippine Science High School Region 7 and LGUs, Local Community Year 2 Publication- Two (2) articles drafted for publication in ISI-Scopus indexed journal Product - One (1) food formulation with nutrient profile; One (1) unit of micro-museums using â€œAugmented Realityâ€ technology; One (1) manual (Technoguide) for terrestrial snail farming Patent - Copyright application for the developed manual (Technoguide) for terrestrial snail farming People and services - Seminar/Workshop on food development using landsnails; at least 10 students trained/mentored Places and Partnership - MOA with DA, DENR, Philippine Science High School Region 7, LGUs, local community Policies - One (1) policy recommendation related to the conservation of ecologically and economically important terrestrial snails	CTU	1.FARMERS - utilize land snail as another farm products to increase yield and income. 2.STUDENTS - increase knowledge and awareness of the ecological and economic importance of land snail. 3.LOCAL COMMUNITIES - embark on a communal land snail farming and protection of habitat. 4.LGUs - formulate policies for a comprehensive conservation plan for malacofauna.	1-Aug-21	31-Jul-23	ONGOING	4,998,858	3,027,922
	Community-based Verification of Fiber Extraction Technology using Local Bamboo Species as a Textile Material	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Natural fibers have a lot of advantages over synthetic fibers since natural fibers emit low pollutants, lower greenhouse gases emission, and are biodegradable. In comparison with other sources of natural fibers, bamboos have a high growth rate and can perform carbon sequestration wherein plants capture carbon from the atmosphere and store it in their biomass (leaves, branches, and pole) during their growth. Several studies showed that bamboo fibers could be reinforced with other composites to further improve the mechanical properties of bamboo fibers. Because of the abundance of bamboo species in the Philippines and its distinctive properties, PTRI develops more environment friendlyprocesses to extract bamboo textile fibers using previous bamboo species that have been evaluated. Â The Philippine Textile Research Institute (PTRI) bamboo technology evaluated 12 Philippine Bamboo Species such as Anos (Schizostachyum lima, Blanco, Merr.), Bayog (Bambusa merilliana, Blanco, Merr.), Kawayang-kiling (Bambusa vulgaris, schrad), Puser (Cyrtcohloa puser, s. dransf.), Buho (Schizostachyum lumampao, Blanco, Merr.), Laak (Bambusa philippinesis, sp.2), Black Bamboo (Gigantochloa atroviolacea, Widjaja), Green Buho (Schizostachyum brachycladum, Kurz), Iron Bamboo (Guadua angustifolia, Kunth), Kayali (Gigantochloa atter, Hassk, Kurz), Machiku (Dendrocalamus latiflorus, Munro) and Thailand Bamboo (Thyrsostachys siamensis, Gamble) in its GIA funded project implemented last year. Evaluation of different bamboo species for the desired properties such as spinnability, yarn count, fiber recovery, and fiber strength has been a crucial step in ensuring which bamboo species is feasible as a textile material.	Publication: Two (2) technical articles on the fiber quality of locally planted Bamboo species in Abra and PangasinanPatent: Two (2) IPs (Utility model/industrial design for fabric rendered using the bamboo blended and natural textile fiber blended yarns)Product: At least 50kgs of bamboo fibers for each identified three (3) local Bamboo species in Abra and Pangasinan200kgs bamboo blended yarnsTwo (2) prototype of fabrics developedPeople: Ten (10) people trained on bamboo textile fiber extraction and natural fiber treatmentPlace: Two (2) Memorandum of Agreement forged with local organizations in Abra and PangasinanÂ Policy:One (1) policy recommendation on the sustainability of bamboo raw materials for textile utilization	PTRI	1. Farmers/farming communities 2. Craft makers3. Handloom weaving communitiesÂ,Â	1-Dec-21	30-Nov-23	ONGOING	16,859,968	8,824,984
	Conservation and Mass Production of High-yielding Falcata Seed Sources in Mindanao (Old Title Conservation and Mass Production of High-yielding Falcata Families in Mindanao (: An Offshoot of Phase 1 Falcata Project "Advancement of Science for the Sustainable Conservation and Utilization of Forest Genetic Resources of Falcata and Yemane")	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The current proposed project (Phase 2) stemmed from the Phase 1 falcata project. The Phase 1 falcata project identified 10 elite trees to conduct progeny selection from the Phase 1 field trials by identifying seed sources that are performing well across a wide range of sites. These â€œgeneralistâ€ seed sources will be tested in different locations with the superior seed sources and more resistant to the attack of gall rust and stem borer from each site are to be conserved and mass produced. Thus, Phase 2 is based around a series of field trials via clonal seed orchard establishment, clonal seedling propagation, and seed tree stand establishment with the participation of local farmers. Phase 2 could accelerate or increase the production rate of falcata wood in the region while ensuring the sustainability of falcata tree improvement program in the country. The output of Phase 2 project will be important in the long-term eradication of underperforming or low-quality falcata populations in the country especially those being used or sold widely by tree farmers and wood industries in Mindanao. These efforts are expected to improve the wood supply in the country and hence the income of farmers engaged tree farming. This proposed project is therefore an offshoot of Phase 1 falcata project and seeks to exploit the gains from Phase 1 through the following component activities, namely: selection of superior seed sources from Phase 1 project, F2 progeny trials via clonal seed orchard establishment, development of clonal propagation protocols for superior seed sources, seed tree stands establishment, and engaging local small-scale farmers in the region on implementation of these activities.	The proposed project is expected to accomplish the following: Year 1: â€ Publication â€ Patent/Intellectual Property â€ Product Â¯ 105 plus trees selected from 5 seed sources Â¯ 4,000 cloned seedlings produced Â¯ One (1) on-site learning nursery established Â¯ One (1) experimental clonal seed orchard established â€ People Services Â¯ 15 forestry students availed services of the rooting experiment and clonal seed orchard areas for their laboratory classes, special problems/thesis â€ Places and Partnership Â¯ Two (2) barangay LGU resolutions supporting the project in their barangay Â¯ Two (2) Memorandum of Understanding (MOU) forged between the project leader and the land-owner of the two areas for clonal seed orchard/demosites â€ Policy Year 2: â€ Publication Â¯ One (1) brochure on plus trees selection protocol produced Â¯ One (1) training module on rooting protocol â€ Patent/Intellectual Property â€ Product Â¯ 8,000 cloned seedlings produced Â¯ One (1) on-site learning nursery established Â¯ Two (2) experimental clonal seed orchards established	CMU	Two (2) peopleâ€™s organizations of tree farmers consisting of 60 participants, particularly, from Talisayan (Misamis Oriental) and Baliangao (Misamis Occidental) Field Trial sites; and 45 forestry students and faculty.	1-Jul-20	30-Jun-23	ONGOING	4,999,992	768,782

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	Design, Fabrication and Field Trial of Rubber Tree Rain Guards for Improved Latex Recovery(Old Title: Design and Field Trial Assessment of Rain Guard for Rubber Trees for Improved Latex Yield)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This study will fabricate a modified rain guard using polyethylene plastic and used motorcycle interior ribber tire to design a rain guard that is suitable to the terrain and rainfall pattern off rubber plantations.	Year 1 1. fabricated and assessed the efficiency and effectiveness of the following designed rain guards: a. PRRI Skirt type b. tapping shade c. lamp shade type d. PRRI shade type 2. determined the prevalence of wetting panel infections in rubber as influenced by the use of different rain guards Year 2 1. evaluated the applicability and acceptability of the and acceptability of the different rain guards to farmers 2. determined the cost and return analysis of the different rain guards 3. showcased the workable/functional rain guards in at least 3 rubber farms 4. developed IEC materials of the technology for information dissemination	DA-PRRI	1. rubber farmers and their household member 2. rubber industry in general	1-Jan-20	31-Dec-21	ONGOING	3,700,000	1,750,333
	Development of an Efficient Rubber Tapping Devices for the Improvement of Rubber Latex Harvesting (Economic Viability of Different Tapping Devices Utilized by Tapping Workers in Rubber Latex Production)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Rubber tapping is an occupation with a high risk for developing carpal tunnel syndrome (CTS). Exposure to excessive ulnar deviation and wrist flexion, among other risk factors, contributes to increased carpal tunnel pressure contributing to the development of carpal tunnel syndrome (Pramchoo et al. 2018). As the rubber-producing countries today is looking towards the advent of technology to accomplish tapping operation in an effective and ergonomic way, this study is an attempt to develop and showcase such technological advancement in the field of latex harvesting. Thus, this study aims to develop and showcase different tapping knives and determine its ergonomics and economic viability to be used by tapping workers in rubber latex production.	Utility model of an efficient tapping knife; established experimental sites; Training of rubber farmers; MS Degree of PRRI staff under the GREAT program	PRRI	The target beneficiaries of this project are current rubber farmers i.e. rubber cooperatives, rubber farmer associations and other smallholders who will be convinced on the economic viability of using different tapping knives in rubber production after the conduct of the research project. Other target beneficiaries of this project are the concerned government offices, such as the researchers and State Universities and Colleges (SUCs) who have Income Generating Project on rubber that will be provided with alternative ways in minimizing the cost of expenses and maximizing the limited skilled men rubber tappers in the sense that women workers in rubber production can be potentially used in the area of latex harvesting.	1-Oct-21	30-Sep-23	ONGOING	4,622,162	3,417,891
	Development of Botanical Pesticides from Indigenous Plants in Selected Forest Ecosystems in Central Luzon (Old Title: Development of Botanical Pesticides from Indigenous Plants in the Forest Ecosystems and Use of Biotechnology-based Propagation and Conservation)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project generally aims to develop botanical pesticides from indigenous plants derived from selected forest ecosystems in Pantabangan Carranglan Forest Reserve (PCFR), Aurora Forest Reserve and Bataan National Park.	6 scientific paper for publication; 4 patentable methods in control; 5 products regarding potential and components of botanical pesticides, green technology, cloning, micropropagation and botanical pesticides from indigenous plants; mentored 1 BS Biology and 1 BS Agriculture and conservation of indigenous plants for people services; for places and partnership are the establishment of cloning facility, ramet garden as ex-situ conservation parks, mou/partnership with selected local barangays; local policy formulation and recommendation, 1 policy brief for policy aspect	CLSU	1.Farmers residing in the project areas and Central Luzon. 2.Indigenous people residing near the project areas 3.Students of state universities/colleges 4.Non-government organizations (NGOs) 5.Local Government Units (LGUs) 6.People$€™s Organizations (POs) 7.Faculty members/researchers	7-Jan-19	6-Jan-22	ONGOING	4,999,977	1,380,109
	Development of Nursery Management and Outplanting Technique(s) for Selected Tissue Cultured Bamboo Species (Old Title: Development of Outplanting and Nursery Management Techniques of Selected Tissue Cultured Bamboo Species)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Bamboos are proven to be of valuable economic, sociological and commercial importance. However, with these known benefits from bamboos, constraints lie heavily on the limited availability of quality planting materials of the appropriate bamboos species. The traditional propagation using suckers, culms, and branches is quite slow. In order to address these concerns, there is a need to produce quality planting materials in mass to cope with the demand to operate the marketing of bamboo and bamboo products in a sustainable manner. Mass propagation through tissue culture of bamboo species will help address this problem. Micropropagation by tissue culture offers to be a powerful technique to rapidly mass-produce quality planting materials of bamboos.Â Â Moreover, the use of quality planting materials from tissue culture may improve the production and sustainable productivity of bamboos with better yield performance.Â Â However,Â Â survival and growth after outplanting are crucial to the success of any micropropagation protocols. An effective outplanting and nursery management may help stakeholders in extensive and cost-effective cultivation of bamboos.In addition to the use of tissue culture techniques for mass propagation, propagation using vegetative/clonal means to the established tissue cultured-bamboos in the nursery will be explored. Bakshi (undated) stated that research into innovative and rapid methods of propagation are urgently required to meet the infinite requirements for industrial plantations of bamboos. The method may contribute to further increase the propagation rate of tissue cultured plants and reduces the cost of micropropagation.The project is expected to help address the problem of lack of planting materials and support bamboo industry development. Increasing bamboo production is a strategic S&T priority (PCAARRD, 2012). Furthermore, the project will generate new knowledge inÂ ex vitroÂ plant propagation systems, nursery management and outplanting.	Publication: At least 2 papers presented in scientific conferences and/or published in refereed journals.Patent: 1-Outplanting and nursery management procedure for tissue cultured bamboosProduct: Tissue cultured bamboos of at least four species Hardened tissue cultured bamboo in the nursery of at least four species Field-demo farm of tissue cultured bambooPeople: Recommendation for filed planting of tissue culture-derived bamboos Trainings Student assistantshipPlace: LGUS, Private StakeholdersPolicy: Not applicable	VSU	The major beneficiaries are the: Bamboo growers for more livelihood opportunities. Bamboo industry Â€Â¬Â€œ supply of quality planting materials while maintaining the environment and forest conservation Students and researchers as the facility will become a learning ground	1-Dec-21	30-Nov-23	ONGOING	3,990,296	2,161,648
	Development of Plant Extract-based Wood Protection Treatment For and From Selected Plantation Species	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Wood is an important forest resource which has been used for various increasing applications, i.e. no longer limited to construction, furniture, handicrafts, toys and musical instruments. Unfortunately, wood being an organic material is naturally susceptible to decay and this condition is further aggravated when it is used in unfavorable service environment like in humid or wet conditions. All wood species can deteriorate if exposed to conditions that support the growth and infestation of different wood degrading and destroying organisms. However, some species like the Philippine Mahogany Group are naturally more resistant to degradation compared to fast growing species like gmelina, falcata and mangium. Application of wood preservatives will significantly increase the life span of these species, thus reducing costs of replacement that also allows for more efficient use of forest resources (FTA 2003). With the depleting supply of local wood due to deforestation and implementation of EO 23 that channels our reliance of wood source to plantation species, proper utilization and protection are, therefore, more than ever crucial to maximize the benefits we derived from tree plantations. Recognizing the need for more durable wood, some preventive and control measures using chemicals have been developed and used. Impregnating wood with toxic chemicals or biocides is the customary way of prolonging the service life of wood. Some of the usual ones that are used in the Philippines are creosote, chromated copper arsenate (CCA) and pentachlorophenol. However, these traditional wood preservatives can also adversely affect human health and the environment. This resulted to the regulated use of these preservatives. Fortunately, serious efforts are now being made globally to develop alternative wood protection methods based on natural products with little or no toxicity effect to humans and the environment. In the Philippines, with the implementation of EO 23, there is a moratorium in the cutting and harvesting of timber in the natural and residual forests, that lead wood utilization options to plantation species like falcata (Paraserianthes falcataria L.), gmelina (Gmelina arborea Roxb.) and mangium (Acacia mangium Willd) . These species were reported to have good physical and mechanical properties (Alipon and Bondad 2008) and are abundantly planted in CARAGA. However, these species if improperly stored after harvesting are more prone to attack of wood destroying organisms like termites and fungi compared to non-fast growing hardwood species. Further, fast-growing species have high proportion of juvenile wood, low density, low strength, high longitudinal shrinkage, low durability, and low mechanical properties that are not suitable for structural timber (Hidayat et. al. 2018). In fact, tree farmers and sawmill operators in CARAGA expressed their need for immediate and practical but low-cost on-site wood protection treatment system to immediately inhibit the attack of these wood destroying organisms prior to processing. This project aims to address this expressed need as the proponents recognize this as the first important step towards maximizing the benefits from these plantation resources vis a vis the fact that commercially available wood preservatives are imported, synthetic and costly. Protecting timber with natural products is one of the most significant challenges in wood technology (Singh & Singh 2011). The extensive literature review showed a vast number of plant sources tested for possible sources of chemicals for wood protection. However, in the Philippines, there are limited study on the use of	6 P'sPublications YEAR 1 One (1) IEC material about extraction and formulation of potential plant-based preservatives YEAR 2 One (1) manuscript for publication in peer reviewed journal PatentsYEAR 2 One (1) invention disclosure application for the developed product/formulation Products YEAR 1 Potential wood preservatives formulation from plant-based extracts YEAR 2 One (1) wood protection formulation and system of application People Service YEAR 1 One (1) graduate student One (1) URA 1 trained YEAR 2 One (1) graduate One (1) URA 1 trained 20 stakeholders trained about the developed wood protection system Places and Partnership YEAR 1 One (1) partnership with industrial tree plantation owners/farmers/Pos in the form of MOU or MOAYEAR 2 One (1) partnership with sawmill/veneer/plywood/wood processing plant in the form of MOU or MOA	UPLB	The target beneficiaries of this project are the plantation developers and farmers, wood processing plants, wood preservation industry, downstream industries and wood users.	1-Jun-21	31-May-23	ONGOING	2,633,484	2,633,484
	Ecological Mangrove Restoration of Abandoned Brackishwater Fishponds in the Philippines	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Mangrove forests decline at an alarming 1% per year (Thomas et al., 2017). About 20% decline in mangrove areas from the last 25 years is due to conversion and coastal development (ITTO, 2010). The mangrove forest cover in the Philippines: 1920-450,000 ha.; 1990- 132,500 ha.; 2007-247362 ha.; 2011-256,185 ha.; Attempts to restore degraded mangroves in the Philippines have been made but very few have reported high success rate (Primavera and Esteban, 2008).	Journal Article on "Ecological Mangrove Restoration in the Philippines". Handbook of Ecological Mangrove Restoration Techniques. IEC materials . Protocol on ecological restoration of abandoned brackishwater fishponds in the Philippines. Pioneer development sites of Ecological Mangrove Restoratiion in the Philippines. Model site developed. Policy recommendation on mangrove restoration. Inputs to the Land Use and Management Plans.	ERDB	Local coastal community, local government units, DENR, DA-BFAR, academic institutions and other institutions.	1-Apr-19	30-Sep-21	COMPLETED	4,996,436	761,389

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	Evaluation on the Agronomic Performance of Rubber RRIM Series in Luzon and Mindanao for NSIC Registration	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Mindanao island is the traditional area which rubber (Hevea brasiliensis) is usually grown. In the last quarter of 2017, the Philippine Statistics Authority (PSA) reported that Zamboanga Peninsula was the top producing region with the production record of 59.03 thousand metric tons contributing to 42.7% of the national rubber production. This was followed with SOCCCSKSARGEN having 41.8% contribution and ARRMM had 6.75. These three regions consistently top the rank in the production of rubber in the country for the past years. The value chain analysis of the Philippine rubber production revealed some of the strengths of the natural rubber industry. Rubber is a site specific commodity that prefers an environment commonly exhibited by countries in the Equatorial belt, thus the Philippines is a favorable geographic location for rubber production. Moreover, the country is also in close proximity to major processors and consumers of natural rubber adding to the strength of the industry. Commitment to increase consumption of local rubber produce by the Yokohama gives additional light in the industry (Daly et al., 2017). Owing to this, there was a documented increase with regards to the area planted with rubber in the Philippines in fact, from 161.6 (â€'000) ha of 2011 it grows to 222.6 (â€'000) ha in the year 2015 (PSA, 2016). The rubber clones that is commonly cultivated in the Philippines includes RRIM 600, RRIM 712, RRIM 901, PB 217, PB 235, PB 260, USM 1, PB 311 and RRIM 628. These clones are distributed in different parts of the country but mostly concentrated in Mindanao. While these clones play an important role in the Philippine rubber industry, the breeding works to introduce new clones for the improvement of the industry is likewise progressing side by side. Resulting to breeding works and different â€œrubber breeding programâ€ of some countries is the advent of these new clones that are said to be beneficial because of the unique traits possessed compared to the others. These new clones have been planted by progressive rubber farmers and known to yield twice the yield of the first introduced RRIM 600. These clones were believed to have been acquired by progressive rubber farmers through the â€œbackdoorâ€ way back early 2010. Since there were already planting of these clones by progressive rubber farmers in Mindanao and Luzon, these plantings shall be used as experimental plots to assess its growth and yield performance which will be basis for its registration. This will do away with establishing conventional field trials from seedlings until it reach a tappable age of 4-5 years. As the strength of the Philippine rubber continue to soar and clonal improvement of rubber is likewise progressing (Daud et al., 2012), the demand for rubberwood is relatively increasing in the past years. It became another area of consideration in choosing for a rubber clone to cultivate with. This demand urges and captures the need of latex-timber clones that both produce good latex yield and timber. The RRIM 2000 and RRIM 3000 series are mostly latex-timber clones (LTC), in fact, the series were among the recommendation of Malaysian Rubber Board to the rubber planters which possessed the latex-timber traits (Benong et al., 2007; Abdullah et al., 2017). New breeds of rubber clones (RRIM 2000 series) were evaluated and was found to be three times higher yield in the latex and timber compared to RRIM 600 (Ong, E. 2000). Early assessment of the growth of RRIM 2000 series was found to be superior compared to the PB 260 (Hoong, et al., undated). Another study of Saffian et al., (2014) evaluated 4 year old RRIM 2000 series rubber clone for the fiber morphology and chemical constituents. Results revealed that RRIM 2000 clone rubberwood trees were found to be comparable to those of more than 25 years old trees in terms of the use in the wood industry. The RRIM 3000 series also exhibited diverse response to various water regimes, owing to these characteristics, RRIM 3000 was declared better than the RRIM 2000	At the end of the study, the following are expected outputs: 1.) geotagged and properly documented farms with RRIM 2000 and 3000 series clone in Luzon and Mindanao; 2.) determined and consolidated morpho-agronomic characteristics of the RRIM series; 3.) documented cultural management practices of the farmers; 4.) identified yield and yield parameters of rubber RRIM clones series; and 5.) facilitated NSIC registration of promising RRIM 2000 and 3000 clones.	DA-RFO 9 ZAMPIARC	Different rubber stakeholder, rubber investors, rubber farmers and research institution	1-Jan-20	31-Mar-22	ONGOING	5,000,000	1,969,040
	Forest Tree Seed Quality Enhancement and Development of MTSC - Seed Tracking and Information Database System (Old Title: "Seed Quality Enhancement of Selected Forest Tree Seed and Development of Mindanao Tree Seed Center - Seed Tracking and Information Database System")	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Caraga Region is known as the â€œtimber corridorâ€ of the country. In 2017, the region is the top producing wood based industry which contributes 492,525 cu.m or 67.15% of logs produced, 30,584 cu m or 72.8% of veneer produced, and 110,647 cu.m or 63.2% of plywood produced. Tree plantation development is very necessary to sustain and improve the current production of wood based industries. In tree plantation development, using quality and improved seeds is very vital component of industrial tree plantation. A â€œQuality seedâ€ is an attribute to produce a good yield, quality of wood based product and dictates high market value. In Caraga region, it was projected an area of 429,642 has. of forestland (opened), Community based Forest management Agreement(CBFMA) area and private tree farms have been identified that demand 37,124 kgs. of seeds of ITP species (Table 1). This tree plantation requires large volume of quality seeds to cater the current demand in Caraga region, less to mention the increasing tree plantation activity in Region 10, 11 and 12 in Mindanao. Mindanao Tree Seed Center (MTSC) is a distinct tree seed center of the country operated for a decade. The MTSC caters the production of quality seeds to support the industrial tree plantation of the country. Likewise, the center also serves as gene bank of high valued plant genetic materials that are risk for extinction and potential for advance scientific research. In 2008, the center was initiated and capacitated from the convergence initiative of DENR â€"ERDS 10, 11, 13 through the support of AUS-AID Public Sector Linkage program by the Commonwealth Scientific and Industrial Research Organization, Australia. In 2009, DOST-PCAARRD approved â€œITP Action Program on the Establishment of Commercial Plantation and Efficient utilization of Wood Products in Caraga.â€ Project 1.1. Seed Collection and Management of Mindanao Tree Seed Center cum Production of Quality Seedlings (2009 -2012), this support initiated the full operation of MTSC that serves ITP tree farmers of the country by providing quality seeds. By then, MTSC partly sustain its operation from the revenue generated from its operation, however it was not continued due to the promulgation of new policy of the bureau. Recently, the center relies on the minimal support from the national project to sustain the operation. In effect, some activities to improve our services were limited. Since then, MTSC identify and select best plus trees as seed source has been one of its priority. For almost a decade, tree seed center caters the needs of quality seeds in different areas for rehabilitation areas (mined-out and reforestation areas) and tree plantation. Seeds coming from this best seed source presume inherited the potential phenotypic characteristics of the mother trees. However, the natural potential of seed quality enhancement is not yet been explore due to limited research fund and equipment to undergo series of laboratory and field research trials. Seed production of the center has been limited to some parameters like purity and viability of a raw seeds. Thus, this research study aims to develop a protocol on enhancement of seed quality, and developed fortified and enhanced tree seed suitable for mined-out area, reforestations area and tree plantation. Furthermore, develop a seed tacking and information database system.	First Year - Developed seed technology on seed fortification, coating and pelletizing of forest tree seeds of nine forest tree species (i.e. falcata, mangium, yemane, kamagong, malapapaya, big leaf mahogany, nato and 2 dipterocarp species) from three (3) different seed storage classification - Determined the effect of various parameters on the tree seed quality enhancement treatments in the laboratory. - Consolidated seed information data for the development of seed tracking and information system. Second Year - Established three field trial experiments in the mined-out area, reforestation area and production forest. - Determined the effect of various growth parameters on the three field trials of the significant developed protocol of improved and enhanced tree seed. - Developed and adopted the seed tracking and information system Third Year - Identified the significant seed quality enhancement treatments in the three field trials for patent recommendation and production of improved and enhanced tree seeds. - Developed and adopted the tree seed tracking and information system - Submitted manuscript to scientific journal - Prepared terminal report for submission to PCAARRD	ERDB	â€¢ DENR and corporate tree growers (IFMA) â€¢ Mining companies for mined-out rehabilitation â€¢ Community Based Forest Management Agreement holder through the peopleâ€™s organization. â€¢ Small-scale tree farmers-small scale tree farmers/ private tree farmers engaged in tree farming â€¢ Tree seed enterprise â€¢ Academe, Researchers â€¢ Forest managers	1-Jul-20	30-Jun-23	ONGOING	4,999,985	1,492,376
	Growth Stress Attributes and Measures to Minimize the Wood Defects of Falcata (Falcataria moluccana (Miq.) Barneby & Grimes) Old Title: Growth Stress Attributes and its Measures to Minimize the Wood Defects of Falcata (Falcataria moluccana (Miq.) Barneby & Grimes)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Falcata (Falcataria moluccana) (Miq.) Barneby & Grimes) tree plantation in Mindanao, Philippines is one of the lucrative ventures of tree farmers. Falcata is widely planted throughout Mindanao and some parts of Visayas and Luzon islands, because of its demands for different wood products. Caraga Region, is declared as the timber corridor of the country as per DENR - DAO no. 99-13. The order supports the timber industry to enhance and develop by providing appropriate land for investment. The region has vast open land, good climatic and environmental conditions ideal for tree plantations. Tree plantations as a common commodity for many decades made this a way of life for many Caragaznons. In 2011, the region contributed 60% of the production for wood of the country. Sixty-seven percent (67%) of national log production is from falcata (Falcataria moluccana) trees (FMB-DENR, 2011). It is the major crop raised in the region. Its suitability to the site as exhibited by its fast growth rate; and the high market demand for plywood, lumber, boxes and crates production that encourage more farmers into falcata tree farming. The log demand of falcata increased spontaneously because of the log ban as per Executive order no. 23 (Declaring a moratorium on the cutting and harvesting of timber in the natural and residual forests and creating the anti-illegal task force). Despite this demand the falcata tree farmer recently experienced odd market price on logs because of the log defects e.g. radial cracks at the log-end and lumber crooking during harvesting, that depreciate the value of logs during marketing and this attributes also the low recovery of wood processing. These defects can be attributed to longitudinal growth stress. Cassens & Sarrano. (2004) emphasised that Longitudinal growth stresses are present in all standing timber and cut logs. In fact, if they did not exist, trees could not maintain a vertical position. Growth stresses are not visible although they can be measured and are called growth strain (GS). When trees are felled and cut into logs and logs processed into lumber the results of growth stresses being released become evident. a study conducted by the USDA Forest service showed that on the average 12.6 percent of the potential lumber tally is lost due to multiple defects (Cahill & Cegelka, 1989). Considering the total volume per hectare of falcata that is 304â€" 40 m3 /ha (Krisnawati et al, 2011) and the price of falcata per volume which is 4,500 per cubic meter (as reported by Director Ricardo Calderon of DENR-FMB in a news article in 2016) an estimated 22,600 pesos/ha is lost due to wood defects. In response to the request of farmers and sawmill operators this study was formulated to investigate the influence of stress induced by growth orientation and provide measures to minimize the formation of radial cracks at the log-end and lumber crooking in both stem and branch and will describe the anatomical features of tension wood and normal wood of falcata. Moreover, this study was specifically identified in the Industrial tree plantation (ITP) Strategic Science and Technology Programâ€™s (ISP on ITP) technology chain and framework) as one of the researchable areas under the harvesting and post-harvest processing chain. Hence, this study is proposed.	The Project will have the following Expected Outputs: 6Ps Metrics Publications â€¢One manuscript submitted for publication in peer reviewed journal â€¢One paper submitted for publication in peer reviewed journal â€¢Production of 200 brochure/leaflets on protocol on how to reduce/minimize falcata log defects Patents â€¢1 submitted application for utility model for protocol on how to reduce/minimize falcata log defects Products â€¢Identified the Physical, and anatomical characteristics of 12 Falcata (both tension and normal wood) for wet season â€¢Identified the Physical, and anatomical characteristics of 24 Falcata (both tension and normal wood) for dry season â€¢Determine d the SRS and RRS of 24 trees both wet and dry season (total of 1,248 strain measurements) â€¢Two (2) experimental set up on the log treatment â€¢1 protocol on how to reduce/minimize falcata log defects â€¢Result of benefit cost analysis of treatment to minimize defects â€¢Determined the Juvenile to Mature Wood Transition of Falcata People Services â€¢1 MS student mentored and 3 undergrad students mentored Places and Partnership â€¢MOU between CMU and ERDB- FWIRDEC	CMU	Tree farmers and private plantation owners in Mindanao, academes and researcher	1-Nov-21	31-Oct-24	ONGOING	5,000,000	2,964,458
	Integration of Traditional and Modern Bioproduction Systems for Sustainable and Resilient Future Under Climate Ecosystems Changes (ITMoB)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Consistent with the global and regional efforts towards pursuing a more sustainable and climate resilient development pathways, the Philippine's National Climate Change Action Plan (NCCAP) comprehensively addresses the primary goal of increasing natural ecosystems' resilience to climate change to promote a climate risk-resilient Philippines. The NCCAP identified seven strategic priorities to sustainable and climate resilient development pathways. These are food security, water sufficiency, environmental and ecological stability, human security, climate-friendly industries and services, sustainable energy, and knowledge and capacity development (Climate Change Commission 2011). This project is a multilateral cooperative research between Japan, Indonesia and the Philippines under the e-ASIA Joint Research Project. However, the outputs enumerated in this proposal is exclusive to the Philippines only and hopes to contribute to the goal of NCCAP.	Database of traditional and modern bioproduction systems in Japan, Philippines and Indonesia jointly developed by participating research team and made accessible online to other researchers following a specific protocol. Framework document co-developed by project partners from Japan, Philippines and Indonesia and validated by key stakeholders detailing the process of creating multiple scenarios of bioproduction systems to determine sustainable and resilient future under climate and ecosystem changes. The framework can also guide the scaling up of the project to other areas in the participating countries for broader impacts. Analytical report on the detailed assessment and predicted impacts on selected bioproduction systems under multiple future scenarios in the project areas in the context of climate change, demographic change and land-use change from 2021 to 2050. Assessment report on the changes in ecosystem services in the project areas produced by selected modern and traditional bioproduction systems under multiple scenarios indicating the potential synergies and tradeoffs between ecosystem services. List of proposed interventions in the project sites to optimize ecosystem services within each scenario based on modeling outputs and consultations with different stakeholders. Workable networking and communication platform developed and institutionalized among project partners in Japan, Philippines and Indonesia like shared data base, project websites, and project output dissemination plan that provides research outputs, policy recommendations, and training materials available to relevant stakeholders.	UPLB	Researchers, academics, and students working on climate change, land use and demographic changes, and ecosystem services Policymakers working on the environment and food security issues Decision-makers like LGUs, national government agencies, and civil society involved in climate change adaptation and mitigation and ecosystem services especially those operating in the project areas Private sectors and development agents with investments/development interventions in the project sites Local communities depending on ecosystem services in the project areas	16-Oct-21	15-Oct-24	ONGOING	17,405,392	6,202,464
	Latex Yield Evaluation of Conventional (S/2) and Novel (S/4) Rubber Tapping Systems	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Some rubber producing countries like Thailand, Indonesia, India, and China introduced reduce tapping intensity (reduced tapping cut length or Low Frequency Tapping (LFT)) with the target to get the same yield per land unit and increase the tapping labour productivity. Therefore, each tapper can be allocated to greater number of trees resulting in reduced tapper requirement when compared with the traditional tapping system. Tapping system described by which a combination of the portion of the trunk covered by the tapping spiral usually half (S/2), third (S/3) or fourth (S/4) spiral, and the tapping frequency like d2 (one day tap and one day rest), and d3 (one day tap and two days â€™ rest) (Vijayakumar K.R., et. al. 2009). However, the tapping panel management recommended by other countries to allow possible tapping period of at least 25 years on virgin bark with d3, d4 or d5 tapping frequencies combined with tapping spiral S3 or S4 is accompanied by use of yield stimulants (2-chloroethylphosphonic acid or ethephon). They also practiced upward tapping using S4 tapping system after the first 10 years of downward tapping in B0-I and B0-II using S2 tapping system. In the Philippines low frequency harvesting system has not been tested. Thus, Latex Yield Evaluation of Conventional (S/2) and Novel (S/4) Rubber Tapping Systems will be conducted to evaluate and compare the two tapping systems in terms of latex yield, cost-effectiveness and farmers â€™ acceptability.	Information in the efficiency of novel S/2 tapping system; Manual on Low frequency Tapping systems; Trainings; Policy advocacy	PRRI	The beneficiaries of this project are the Rubber Farmers and their household members, Rubber Cooperatives, Rubber Association, LGUâ€™s and SUCsâ€™ in Zamboanga Sibugay and North Cotabato.	1-Oct-21	30-Sep-23	ONGOING	5,000,000	2,624,925

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
	Localized Conservation Strategies of Plant Resources in Forests over Limestone of Samar Island	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Setting conservation priorities is essential in biodiversity conservation since not all plant species had been assessed by IUCN and the national committee on Red List. This helps identify the taxa that need to be targeted for conservation with local communities taking active part. Thus, a list of conservation priorities provides knowledge on plants that need to be targeted for regulation and wise utilization by the local communities in Samar before these are overharvested and eventually become extinct. It is also a crucial step in creating conservation strategies for the species and ecosystems, given the limited financial resources allocated in any conservation efforts. It can give the planners, resource managers, and local people essential information on local biological diversity of cultural and economic importance (Brehm et al., 2010). Moreover, this approach can also be used in identifying the priority areas for conservation (Chanthavong and Buot, 2019).This proposed project will also provide an equal opportunity for men and women in the local communities to actively participate in addressing biodiversity decline. The conservation priority setting is instrumental for the formulation of science-based strategies on sustainable use and conservation of biodiversity. The local policy will be formulated alongside consultations among stakeholders from different sectors. We hope to contribute to SDGs 5 (Gender equality), 6 (Clean water), 11 (Sustainable cities and communities), 12 (Responsible consumption and production), 13 (Climate Action, 15 (Life on land) and 17 (Partnership to achieve goal).Â	Publication: Preparation of 2 research articles for publication in refereed journals. The articles will be based on the outcomes of this research project. Communication, Education and Public Awareness (CEPA) materials Patent: N/AProduct: N/APeople: Training for PO leaders and park managers Mentoring of students and faculty members of SUCs Place: Three municipalities/study sites, partnership with POÃ¢,-,â¿cs (BOSIS and TORPEDO) and local academic institutions (SSU and ESSU-Salcedo) Policy: Local policy for the assessed plant species and gender roles on conservation	UPLB	Residents of the four municipalities, members of Peoples Organizations (POÃ¢,-,â¿cs) general public, Local Government Units (LGUs) of Paranas, Taft, and Guiuan	1-Dec-21	30-Nov-23	ONGOING	5,000,000	5,814,606
	Management of White Root Rot (Rigidoporus lignosus) Using Endophytic Fungi from the Roots of Healthy Rubber Tree	KRA 3: Rapid, Inclusive and Sustained Economic Growth	White root rot of rubber is the most serious disease affecting in almost all rubber clones resulting in severe loss of production. The infective fungal organism of the white root rot disease is Rigidoporus lignosus (klotsch) Imasaki. It is the main cause of rubber tree losses with 40-60% of the trees destroyed over a period of 21 years. White root rot of rubber is being controlled using chemical fungicides. Aside from additional production cost, the continues use of chemicals becomes a public concern due to its detrimental effect in the environment. With the increasing awareness on environment conservation, it is vital to develop disease management technique which is environment-friendly and reduces the use of chemicals. Using biological control technique is an attempt to reduce the use of chemicals. Fungal endophytes are considered as potential candidate for biological control agent. Therefore, this project will provide information on the diversity of fungal endophytes associated in the roots of healthy rubber and screening for its potential antifungal activities to manage and control white root rot as biofungicide. Mass production of potential fungal endophytes as biofungicide against white root rot disease of rubber may lead to economical disease control that could increase farmers income.	Publications Year 1 -1 information bulletin/brochure on white root rot of rubber Year 2 - 1 article for publication in a refereed journal - 1 handbook guide on white root rot disease of rubber and biological control measure Patents At least one (1) patentable product (biofungicide formulation) using endophytic fungi Products - At least one (1) Formulated Endophytic Fungi as biofungicide. - At least 1 demo farm for field trial/experiments on the efficacy formulated biological control agent against white root rot disease on rubber People Services Year 1 Thesis conducted of at least 1 selected undergraduate student and at least 1 Graduate Student on the isolation and screening of endophytic fungi against WRR. Year 2 At least 1 information caravan conducted on the information dissemination of the new technology. Places and Partnerships Year 1 - Partnership and collaborations with rubber farmer cooperators, SUCs, DA-RFO, and LGUâ€™s -At least 1 plantation sites per region for disease survey. - At least 1 plantation sites per region for collection of healthy rubber roots as source of endophytic fungi.	DA-XI	The results of this study will be useful to rubber growers especially in small-scale areas, agro-based industries, state universities and colleges, cooperatives and peopleâ€™ organization that into rubber venture. This also generate and benefit students especially agriculture practitioners that is interested in this new knowledge and information on endophytic fungi and its benefit to disease control.	1-Oct-21	30-Sep-23	ONGOING	5,000,000	2,908,868
	Morphological, Anatomical, and Physio-Mechanical Properties of Lesser-Used Bamboo Species in the Philippines	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The bamboo of the Poaceae family has been well known with many names such as poor man â€´s timber and poor manâ€™s lumber, until the time that it became conventional and popular, changing its alias to grass of hope, grass of life, grass of thousand uses, green steel, green gold. The bamboo grass has many uses such as: source of food, construction material, hygiene, medicine, fodder, fuel, paper, fabric industry, household products, raw materials of craft, accessories, scaffolding, instrument for acoustics, floorings, board, panels, and roofing (Hossain et al., 2016). Due to its pliability, incredible growth rate, convenience, and numerous uses, it has become to be one of the most important Non-Timber Forest Products (NTFPs) that greatly affects the daily life of people living within the forest area (Ravindra et. al. 2019).The morphological properties could help determine the volume of usable pole and provide a better commercial prospect. On the other hand, anatomical properties are important to determine the suitability of the species for paper making and other end-uses. Lastly, the mechanical and physical properties of lesser-used bamboo species (LUBs) is essential for structural uses where strength is critical (Razal, 2013). According to Abdullah et al. (2017) density and shrinkage properties are vital factors for determining the suitability of bamboo for various application, with density associated with mechanical properties. Bamboo as construction and engineering material has gained an impact in architecture and aesthetics. Since its renewable, environment friendly and extensively available it became a substitute building material, concurrent to the wood resources in the forest which are diminishing, and imposed laws restricts and limits the use of trees (Raj & Agarwal, 2014). Due to its rapid growth rate, bamboo species can adapt to most climatic conditions and due its incredible properties it became a very suitable alternative. Determining the morphological, anatomical, and physico-mechanical properties of LUBs can help identify the range of application for better utilization and efficiency in managing our resources.	Publication: ISI publications on the morphological, anatomical, and physico-mechanical properties of lesser-used bamboo species grown in the PhilippinesLeaflet/brochure on properties of lesser-used species of bamboo grown in the Philippines and proto-type product using the lesser-used bamboo speciesPatent: n/aProduct: Information on the morphological, anatomical and physical properties of selected lesser-used bamboo species People: The target beneficiaries [bamboo growers, plantation growers (DENR, developer), Bamboo industry] will benefit on the results/information generated in this projectPlaces and Partnership. Memorandum of Agreement between DOST-FPRDI and DENR - ERDBPolicy: Research results will serve as significant inputs in the formulation of policies/rules and regulation for utilizing lesser used bamboo for various uses such as construction materials, furniture, handicrafts engineered bamboo, etc.	FPRDI	Community bamboo farmers Plantation grower Bamboo industry	1-Dec-21	30-Nov-23	ONGOING	4,999,173	2,737,086
	Production, Characterization, and Potential Applications of Biodegradable Plastic from Bamboo (BambuPlastic)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Plastics are versatile materials as evident of its use in our everyday lives including packaging, construction, transport, electronics, etc. It's clear that modern life would be very different without them. Since plastics are so durable and don't corrode, they create considerable disposal problems. This can be attributed to the stable long polymer chains of petrochemicals. They aren't good for the landfill, as many will persist for hundreds of years. When plastics are incinerated, dangerous gases can be produced. In addition, out of staggering 2.7 million tons of plastic waste generated in the Philippines each year, 20 percent of which is estimated to end up in the ocean (McKinsey, 2015). To address the problem, works are continuously being conducted to replace the conventional petrochemical-based plastics with bio-based or biodegradable materials that are environmental-friendly. One of the possible sources of biomass for the production of â€œbioplasticsâ€ is bamboo. In a previous study supported by the Philippine Council for Industry, Energy and Emerging Technology Research and Development (PCIEERD) cellulosic micro- and nano-crystals and fibrils from bamboo were extracted and were incorporated in starch and xylan films. Improvements on the properties of the films were observed. However, these products just used minimal amount of bamboo (<12%). In addition, lignin was not used utilized. In a related completed research project funded by Philippine Council for Agriculture, Aquatic and Natural Resources Research (PCAARRD) both cellulosic materials and lignin were extracted from Industrial Tree Plantation Species (ITPS). The cellulosic materials were used as additive to starch and polyvinyl acetate (PVAc) while lignin was used as an additive to epoxy and polylactic acid. In the studies, cellulose and lignin were used separately and involved the use of only up to 10% of each of the materials. This research proposal intends to use the lignocellulosic materials from bamboo by regeneration of lignin and recombining it with cellulose in a simple and direct process. Majority of the cellulose and lignin will be retained and will be converted to a plastic-like material. The development of high value bamboo products is one of the priority programs as specified in the Industry Strategic S & T Plan prepared by PCAARRD-DOST. The planting of bamboo is desirable from both an environmental and economic standpoint. Bamboos provide cover to degraded uplands and enable farmers to earn income from their planting and harvesting upon maturity. The project is aligned with the governmentâ€™s thrusts of poverty reduction and empowerment of the poor targeting the development of an alternative product from bamboo for the benefit of farmers who plant and produce bamboo poles. Likewise, project results can lead to increased productivity of bamboo-based	Publications Year 1 One (1) IEC material, i.e. information bulletin/brochure about the chemical properties of bamboo and its potential for the production of biodegradable plastic Year 2 Two (2) scientific articles submitted for publication in peer reviewed journal Patents Year 1 Trademark for BambuPlastic and/or BambuPlastik One (1) invention disclosure application for the developed protocol for the production of and the product BambuPlastic Year 2 One patent/utility the developed protocol for the production of and the product BambuPlastic Products Year 1 Protocols for the extraction of lignocellulosic material from bamboo and production of biodegradable plastic sheets from bamboo Year 2 Biodegradable plastic with optimized properties People Services Year 1 and 2 One (1) graduate student One (1) technical personnel trained	UPLB	The target beneficiaries of this project are the bamboo plantation developers and farmers, bamboo processing plants, plastic manufacturing plants, and consumers who are willing to use sustainable and environmental-friendly products.	1-Sep-21	31-Aug-23	ONGOING	4,998,838	3,053,169
	Resource Assessment and Utilization of Indigenous Fruit Trees in CALABARZON (Old Title: Resource Assessment and Propagation of Underutilized Indigenous Fruit Trees for Natural Food Colorant, and Flavoring Agent]	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will focus on the propagation and utilization of native trees which will result in increased awareness and knowledge of their economic importance thereby enhancing the conservation of these species. This project aims to collect and determine the distribution of the fruit trees above in CALABARZON; conduct ethnobotanical and market survey on the traditional and current use of these indigenous fruit trees; and establish protocol for the propagation of these indigenous fruit trees in nurseries. Moreover, this project aims to determine the phytochemical components of above-mentioned indigenous fruit trees; optimize the processing of natural colorant, and flavoring agents in the form of powder, puree and syrup from indigenous fruit trees using the UPLB-DOST Food Innovation facilities (ie. spray, freeze and cabinet dryers, can, pouch and vacuum sealers, and water retort); and determine their functional properties and potential application as natural colorant or flavoring agent in yoghurt and yoghurt drinks, baked products, beverages, confectionary, and meat products. Ultimately, we will recommend which plant species can be conserved or protected for their potential economic values based on the studies conducted.	1.Draft policy briefer/input on natural food colorant and flavoring agent from indigenous fruit trees, their exploration, conservation, propagation, wise utilization, trade and development 2.Optimized processing conditions for natural food colorant and flavoring agent from indigenous fruit trees 3.Optimized protocol for the propagation of the selected indigenous fruit trees	UPLB	Various stakeholders, Tree Farmers/Growers, Farmer organizations, LGUs and NGOs, Students, Filipino Consumers.	1-Aug-21	31-Jul-23	ONGOING	5,000,000	3,181,900

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
	Screening of Potential Endophytes as Biocontrol Agent Against Major and Emerging Diseases of Rubber(Old Title: Development of Biodiversity-based Management Strategies Utilizing Endophytes as Biocontrol Agent Against Major and Emerging Leaf Disease of Rubber)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Chemical, genetic and cultural practices have been used so far for the control of these diseases, but none has provided sufficient and economical methods for desired results. With the increasing concern in conserving the environment, and reducing the risk of health impact due to pesticides, it is imperative to develop sustainable disease management strategy with emphasis on reducing the use of chemicals such as the exploration of biological control agent utilizing endophytic fungi. Endophytes are considered as excellent candidate for biological control which exist ubiquitously in plant hosts which may provide defense mechanisms against pests, pathogens and adverse environmental conditions (Puig and Cumagun, 2019). Hence, this study was conceptualized.	At the end of the project, the following are the expected outputs: 1. Quantified disease severity of major and emerging leaf diseases of rubber in the different plantation areas/locations in North Cotabato. 2. Collected at least 100 endophytic fungi associated with rubber in North Cotabato. 3. Determined at least 1 effective endophyte (in vitro and in vivo) and determined mode of action (mycoparasitism, antibiosis, production of volatile compounds) against leaf diseases of rubber. 4. Identified effective endophytic fungi and generated DNA sequences and pure culture of the microorganism to be deposited in the database and culture databank. 5. Confirmed the endophytic nature/endophytism of at least 1 effective endophytes: the proof of an effective/potential biological control agent	USM	The results of this project will be beneficial to rubber growers both in nursery and small-scale areas, other agro-based industries, different government agencies such as DOST, DA. The information on antagonistic microorganisms generated in this project will also benefit the students, scientists, and other agriculture practitioners and will be recognized as new information in science particularly in plant health both for national and international levels.	1-May-21	30-Apr-23	ONGOING	5,000,000	2,963,208
	Spore Morphology, Ex-situ Conservation and Utilization of Mindanao Indigenous Pteridophytes	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This research will elucidate the spore morphology of pteridophytes in Mindanao using the Scanning Electron Microscopy (SEM) to solve some taxonomic problems and show phylogenetic relationship of the families, genera and species.Â Importantly, this project will mass propagate, conserve and utilize the pteridophytes in participation with selected indigenous groups.	Publication: Year 1 Year 2 Ã‚Â Ã‚Â·Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â 2 scientific papers published Ã‚Â·Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â 3 CEPA on In-situ and Ex-situ conservation (40%) Ã‚Â·Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â 4 CEPA on In-situ and Ex-situ conservation (60%)	CMU	The beneficiaries of this research include barangays around the selected mountain ecosystems, officials of the LGUÃ¢â‚¬â„¢s and DENR Protected Area Management Board, forest guards, Manobo-Tigwahanon in Bukidnon and Manobo-Matigsalog in Marilog, Davao City, conservationists, hobbyists, TLDC researchers, academic institutions and policy makers.	1-Dec-21	30-Nov-23	ONGOING	4,997,147	2,837,198
	Sustainable and Eco-Responsive Bamboo Textile Fiber Processing	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The Philippine Textile Research Institute (PTRI) explored, developed, and applied IP protection for the conventional approach in extracting bamboo fiber which involves a process or combination of processes ofÂ chemical and mechanical treatments to attain desirable textile fiber properties suitable for spinning. However, the increasing awareness of environmental sustainability and responsible production has pavedÂ the way for the Institute to explore sustainable alternative processes suitable for natural textile fiber treatment. One of the propositions evaluated from the previous GAA-funded projects of PTRI is the utilization of enzymes in natural textile fiber treatment. The single and multiple-enzyme concoctions improveÂ the natural fiberâ€™s processability by removing specific non-cellulosic components in the fibrous material while maintaining the cellulosic part that constitutes most of the essential fiber in textile processing. However, the enzymatic treatment alone resulted in a relatively lower fiber recovery. With this, to sustain the ecologically sound and green approach with high fiber efficiency, the project will utilize a combination of thermomechanical and enzymatic processes for the treatment of bamboo fiber from three endemic bamboo species: Laak (Bambusa philippinensis), Anos (Schizostachyum lima (Blanco) merr.), and PuserÂ (Cyrtocholoa puser s. dransf .) in the Philippines for textile application.	Publications One (1) publication on the thermo-mechanical-enzymatic treatment of bamboo fiber from three (3) different species One (1) publication on the spinnability of the treated bamboo fiber to blended yarns Patent One (1) IP filed on the thermo-mechanical-enzymatic treatment process of bamboo fibers One (1) IP filed on the blended spun yarns and fabric prototype developed from treated bamboo fibers Products Three (3) bamboo blended yarns from three (3) bamboo species namely Laak (Bambusa philippinensis), Anos (Schizostachyum lima (Blanco) merr.), and Puser (Cyrtocholoa puser S. Dransf.).	PTRI	Bamboo farm owners and fiber producers Local textile manufacturers Garment manufacturers General public	1-Oct-21	30-Sep-22	ONGOING	4,988,915	4,988,915
Harnessing Emerging Technologies for Mangrove Crab Culture and Resource Management: 'Omics Approaches, Web-based and Mobile Computing Technologies	Project 1. A Rapid Cost-effective Method to Screen Potential Sources of Immunostimulants and Growth Promoting Feed Additives for Scylla serrata using a Functional Genomics Approach	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Feed development will require expensive iterations in the formulation of functional feeds, starting from testing potential immunostimulants to checking for doses that work. The project proposes to shorten these processes of iteration by coming up with a qRT-PCR based assay kit that will allow prioritization of potential sources to use for development into feed additives. The project will then test 3 potential sources and use that which produces the best reaction from S. serrata, and move on to develop a novel feed. In the process of immunostimulant source screening and feed development, a better understanding of the mechanism for innate immune activation and the coupled process of imparting disease resistance and improving growth rates will be better understood. This work will focus on the response to WSSV infection.	1.A rapid cost-effective means to determine immunostimulant and growth promoting properties of potential sources of feed additives 2.qRT-PCR based panel of primers for rapid screening 3.Identified and characterized 3 novel sources of immunostumulants and growth promoter 4.Information on the coupled effect of disease resistance and growth rate improvement presenting pathways where interventions may be possible 5.One novel functional feed	DLSU	1.Mangrove crab farmers, pond owners and nursery operators 2.Research community working on the discovery and development of feed development R&D 3.Feed development industry 4.Biotech industry seeking to develop gene expression screening products for use in the agriculture/aquaculture sector	1-Aug-19	31-Jul-22	ONGOING	16,326,495	4,854,220
Harnessing Emerging Technologies for Mangrove Crab Culture and Resource Management: 'Omics Approaches, Web-based and Mobile Computing Technologies	Project 2. Molecular Mechanisms Underlying Scylla serrata Response to White Spot Syndrome Virus (WSSV) Infection: Metagenomic and Transcriptomic Approaches	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Microbiome and transcriptome studies of mangrove crabs in response to WSSV challenge will provide important insight into aspects of white spot disease dynamics, molecular mechanisms underlying host and holobiont response and host-pathogen interactions. The data generated using these omics technologies will be useful towards efforts to identify biomarkers associated disease status and disease resistance to support the development of disease mitigation and control strategies.	1.Information on dynamics of WSSV infection in S. serrata; 2.Microbiome community profile of S. serrata in response to WSSV infection. 3.Transcriptome profile of S. serrata in response to WSSV infection. 4.Identification of putative immune-related genes and biomarkers of physiological status of S. serrata associated with WSSV infection.	UPD	1.Local researchers, particularly graduate students and research staff, provided opportunities to develop capabilities in interdisciplinary studies and use of advanced molecular methods. 2.Research/Scientific community as results from these studies will provide further avenues for research related to the study of viral disease in mangrove crabs. 3.Stakeholders in the mangrove crab industry (government and private sector) may benefit from the development of biomarkers for monitoring physiological status, disease status, and potential novel directions for mitigation and disease.	1-May-19	30-Apr-22	ONGOING	15,101,598	2,649,866

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
Harnessing Emerging Technologies for Mangrove Crab Culture and Resource Management: 'Omics Approaches, Web-based and Mobile Computing Technologies	Project 3. Validation of local practices with genetic marker base and GIS technologies to maximize use wild caught and traded mangrove crab juveniles (Old Title: CrabTECH: Enhancing Mangrove Farm Productivity thru Genetics and Information Technology)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	This study involves the deployment of genetic marker-based and GIS technologies to fisher communities and traders in Luzon, Visayas and Mindanao through workshops, and further needs assessment at the ground level. This would allow the validation of the effectiveness of new technologies side-by-side with local practices on juvenile species identification and mangrove crab site selection, develop a network of stakeholders that are willing to adopt new technologies, and assess the impact of these interventions to farm productivity and efficiency.	(1)An impact assessment report on genetic marker-based and GIS technologies and a compendium of local practices in juvenile species identification and mangrove crab site identification; (2)Database and network of mangrove crab stakeholders in the country that adopt new technologies and with updated knowledge in molecular biology and information technology; (3)A mangrove crab stakeholder website and database featuring an online CrabMAP updated regularly through data-mining algorithms and a nationwide network of contributors, and a feedback system on new technologies.	DISU	Regulatory Bodies, LGUs, Research and Academic Institutions, and the General Public.	1-Aug-19	31-Jul-22	ONGOING	4,606,476	2,238,167
Mussel Biotechnology Program (Old Title: Biotechnological Utilization of Philippine Green Mussel Perna viridis (Mussel Biotech Program))	Project 1. Development and Characterization of Bioactive Protein and Lipid Products from Mussels (Proj. 1 Extraction and Characterizatio of Bioactive Protein and Lipid from Mussel)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	The study will look into the potential of mussel as a source of lipids with anti-inflammatory activities and nutritional supplement. The final product will be encapsulated lipid fraction or lipid mix that has anti-inflammatory activities and nutritional benefits and is fit for human consumption and incorporation into food systems.	1. Efficient method for isolating bioactive peptides and lipid 2. Isolated peptides with antioxidant and antimicrobial properties 3. Extracted lipid or fraction with anti-inflammatory properties 4. Shelf-stable bioactive peptide and encapsulated lipids.	UPV	The results of the project will be beneficial to the general consumers; mussel farmers, researchers, and food supplement industry partners	1-Jan-19	30-Jun-22	ONGOING	17,486,760	1,938,088
	Capability Enhancement of Local laboratories in the Determination of Inorganic Toxic Elements in Aquacultured Milkfish through Proficiency Testing Scheme	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	To support the enhancement of the capability of the local testing laboratories in the Philippines for the measurement of inorganic toxic element in fish, a proficiency testing (PT) scheme will be organized during the duration of the project. Milkfish is the chosen matrix as it is among major species produced in the Philippine aquaculture fisheries. While the toxic elements to be analyzed are lead, cadmium, arsenic and mercury. These toxic elements have been identified in the Focus group discussion conducted with the local testing laboratories.	Publication: One (1) presentation in scientific fora/conferencePatent: Not applicableProduct: Year 1 a. Four (4) validated method: for GF-AAS for Pb and Cd, HVG-AAS for As, and DMA for Hg in milkfish b. One (1) proficiency test item for toxic elements in milkfish Year 2 a. Four (4) validated ICP-MS method: for toxic elements Pb, Cd, As, Hg in milk fishPeople: Year 1 Two (2) staff trained on chemical test and analysis Year 2 PT scheme for toxic elements in milk fish (pre-and post-PT)Place: Bureau of Plant Industry (BPI) and other PT participantsPolicy: Not applicable	ITDI	Â¿Â Local testing laboratories are the primary beneficiaries of this project as support will be given through local PT provision. PTs are generally procured internationally because of the unavailability of PT providers for inorganic contaminants in the country.Â¿Â Prepared PT Rams will also support the QA/QC systems for method validation and internal quality control of these laboratories. Collaboration with the Philippine Accreditation Bureau (PAB) and Philippine Metrology, Standards, Testing & Quality (PhilMSTQ) enhance the involvement of these laboratories. Â¿Â In response ISO/IEC 17025:2017 requirement, the PAB LA/SR01- Supplementary Requirements on Participation to Proficiency Testing Programs states that Â¿Â¿The laboratory shall participate in at least one (1) PT for each major area which accreditation is being sought and the validity of the PT participation shall be maximum of two (2) years prior to application for accreditationÂ¿Â¿[24]. With this, cost savings are projected if there is a local provider, like the Metrology in Chemistry, for PTs and RMs in the Philippines. With this local capability to be established from the project, the needs of these laboratories will be addressed.Â¿Â Customers of these participant laboratories will also benefit from the gained competencies and improved QA systems resulting from the outputs of the project.Â¿Â	1-Dec-21	30-Nov-23	ONGOING	4,999,999	2,878,758
	Development and Provision of Proficiency test Scheme in Shrimp Product for Local Microbiological Laboratories	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	This project aims to assist the shrimp industry by developing quality control materials for microbiological testing laboratories in the country. It is recognized that laboratory testing is an integral part in ensuring food safety through accurate measurement. The DOST-ITDI, through the National Metrology Laboratory, has developed its capability in the field of biological metrology for microbial measurement by developing of a microbiological proficiency test (PT) materials and the provision of PT schemes for local laboratories. This is in response to the need for local PT providers in the country. This project will develop the PT material, Salmonella sp. and APC in frozen, shelled shrimps product. The PT schemes is intended for the Bureau of Fisheries and Aquatic Resources laboratories and other microbiological testing laboratories in the country.	Proficiency Test (PT) materials for salmonella sp. Detection and Aerobic Plate Count in frozen, shelled shrimp product	ITDI	Local microbiological laboratories involved in food testing	1-Nov-21	31-Oct-23	ONGOING	4,997,326	2,731,494
	Development and Validation of Mussels Automated Depuration System (MADS) (Old Title: Validation and Pilot Testing of Mussels and Oysters Automated Depuration System (MOADS) in Vulnerable Areas of Region III)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	This project aims to develop Mussel Automated Depuration System (MADS) for large volume production. It is a mechanism to control and manage the whole operation of depuration process. The process will be automatically monitored and appropriate action will be applied by the system. It will aid the operators to determine the optimum depuration time. The project has two components: (1) automation of the UPV recirculating depuration system based on the MADS technology developed by BPSU, with emphasis on its cost-effectiveness and applicability; and (2) experimental confirmatory trials of MADS to verify the effectiveness of the technology in reducing or eliminating bacterial count at allowable limits.	Automated UPV depurator system Design with MADS technology of BPSU Efficient & Effective MADS Low Mortality Rate of Mussels SMS	BPSU	Beneficiaries include mussel farmers, entrepreneurs, processors, researchers, technicians/extensionists, policymakers, and consumers.	1-Oct-19	30-Sep-21	COMPLETED	4,064,122	251,196

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
	Development of Captive Breeding and Larval Rearing Protocols for the Endangered Sardinella tawilis	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Development of captive breeding and larval rearing technology for tawilis is necessary and urgently needed for the conservation of this species, which could potentially contribute to food security and sustainability of aquatic resources. Through captive breeding and stock enhancement, biodiversity in lakes can be revitalized, thus restoring native ecosystems. Breeding them in captivity will ensure continuous survival and viable fish populations in case a powerful explosion of Taal Volcano is inevitable and with the continuous fisheries overexploitation and other threats it has been facing for several years. Captive breeding will allow production of fish stocks which can be used for restocking in Taal lake after catastrophic events and in other lakes. This project aims to develop protocols for captive breeding and larval rearing of tawilis by determining optimal water quality conditions, appropriate live feed, and feeding regime. Â The primary goal is to develop protocols for captive breeding and larval rearing of tawilis. This can be done through a series of experiments which would allow determination of optimal conditions for breeding in captivity, seed production, and larval rearing of tawilis. Appropriate feeds, feeding regime and the possibility of using commercial feed will be determined and explored. At the end of the project, accessible and replicable protocols will be developed to ensure technology transfer to government agencies and local fish farm operators. This could potentially enhance tawilis stock in the wild and may provide an additional source of livelihood for fishermen and aquaculturists.	Publication: 1 ISI journal article publication and 1 local or international paper presentation, Techno-bulletin on protocolsPatent: Protocols on captive breeding and larval rearing of tawilisProduct: NonePeople: 1 Graduate Student/ 2 Undergraduate Thesis Students, Training/Workshop of Researchers/TechniciansPlace: BFAR-IV-A, TVPL-PAMO DENR, LGUsPolicy: None	UPLB	The project can help in the conservation of tawilis especially now that its wild catch has been reported to decline.Â,Â This project can also open a new path in fisheries research and inland aquaculture for tawilis, which could serve as potential source of income for fisherfolks.	1-Dec-21	30-Nov-23	ONGOING	5,000,000	2,910,740
	Development of Models for Assessment and Monitoring of the Seven Lakes of San Pablo	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Monitoring of the water quality is necessary to sustainably manage the lake water. It also provides the objective evidence necessary to make sound decisions on managing water quality in the future. The development of the water quality index (WQI) is an ei¬ective approach to identify the status and condition of Seven Lakes. Water quality is ai¬ected by natural and anthropogenic ini¬juences. It is done so that the LGU and community know the current status and emerging problems in the lake. WQI report is easier for the general public to understand than a large amount of complicated environmental data presented. This will also satisfy two important sustainable development goals by the United Nations (UN) â€" clean water and sanitation and life below water. It is done so that the LGU and community know the status and emerging problems in the lake. One problem of the aquaculture lakes in San Pablo is the occurring i¬ish kill which damages the economic condition of the i¬ish farmers. Developing the predictive model using Bayesian Network Model will provide them what are the factors that could cause i¬ish kill and the solutions to be done to avoid this event. These two developed models would be helpful in crafting short- or long-term development policies to sustainably manage the lakes.	Publication: The project would target to publish 4 ISI journal articles (2 per year).Patent: The output models of the project which is a scientific process could be a source of profit in the future.Product: The output models of the project which is a scientific process could be a source of profit in the future.People: The project will mentor two undergraduate students who will specialize in Freshwater Ecology and one graduate student who will specialize in Modelling. This will be on a yearly basis.Place: The project will partner with the local government unit of San Pablo and FARM-C of San PabloPolicy: The project will draft a policy recommendation for sustainable management of the lakes to the LGU of San Pablo.	UPLB	a. Local Government Unit of San Pablo The results and output of the study can be used by the LGU to craft effective policies and management strategies to protect and conserve the lakes. They can create a comprehensive management strategyÂ,Â and action plan for the Seven Lakes of San Pablo. Â,Â b. Aquaculturists/Fish farmers Refining the legalities of establishing aquaculture systems will support the livelihood of authorized aquaculturists by decreasing competition from illegal aquaculture pens and increasing their supply while supporting the sustainable management of the lakes. The fish farmers can also be capacitated and train on how to monitor water quality. c. Local Business Owners The findings will assist local business owners in the effective positioning of their respective stalls around the lake to support sustainable management. d. Local Community Members Community members residing around the lake will have knowledge on the impacts of their activities on the water quality of the lake. They will be capacitated on how to protect the lake against water quality degradation.	1-Jan-22	31-Dec-23	ONGOING	4,727,560	2,944,405
	Development of Propagation Protocol for Clarias macrocephalus Towards Its Conservation (Old title: Evaluation of Reintroduction of Clarias macrocephalus through Conservation Genomics)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	The project will apply translocation experiments in controlled systems to test whether functional genetic variation is a good predictor for long-term introduction success or whether transcriptional profiling can predict short-term acclimation and survival. It will conduct experimental re-introduction of Clarias microcephalus in Pangasinan and Panay Island and develop a propagation protocol towards its conservation.	Phase I â€¢Assembled transcriptome for the C. macrocephalus from Cagayan and Agusan population. â€¢Identification of differentially expressed genes (DEGs) of the Cagayan and Agusan catfish population and their functions Microsattelite markers and single nucleotide polymorphism (SNP) markers Phase 2 â€¢Identify functional differences that are related to important physiological processes and responses to environmental stressors; this can be used in the prediction of specific trait response upon reintroduction and will enable one to choose appropriate source of population for reintroduction. Phase 3 â€¢Performance of the identified catfish population from Phase 2 without competition and under competition; comparison of the transcriptome response with or without competition	UPV	Aquatic ecological scientists and managers as well as fish farmers.	1-Jan-20	31-Dec-22	ONGOING	7,715,836	2,415,714
	Effect of Biofloc Technology on Water Quality and Growth Performance of Macrobrachium rosenbergii and Assessment of the Associated Bacterial Communities	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Biofloc technology has become a popular technology in the farming of tilapia, Penaeus monodon, Litopenaeus vannamei. It is an advanced technology identified for solving evolving viral problems and rising costs for energy. BFT has already been pilot tested in three farms in Luzon, two in Visayas, and two in Mindanao. Biofloc technology proved success in the culture and production of tilapia, and shrimp but there is no work on the effect of this tshnology in the culture of freshwater prawn in the Philippines. This study is the pioneer attempt to apply BFT in the culture of freshwater prawn in grow out culture. Moreover, characterization of the complex microbial communities associated with the biofloc might help in deciphering the bacterial influence towards optimal water quality and health of animals being cultivated. Since no study exists on the microbiome diversity associated with giant freshwater prawn in a biofloc system, this project will help understand the disease-free shrimp surface microbome as well as its rearing water microbiome in such a system and look for changes if there is any. This study will provide a basis for future work to understand the host-microbe interaction, and the relationships between disease outbreak and the bacterial community associated in the host organism. This will also provide a basis for future work on the production of effective artificial biofloc stock in laboratory using various microbial. And even future works combinations specially on biotechnological applications like screening microbes and small invertebrates in the biofloc for the production of antimicrobial products, probiotics, etc.	Higher production performance Increase in production of freshwater prawn in the area Improved water quality Lessen farm discharge Future works on biotechnological applications for the production of antimicrobial products, probiotics, etc	MSU-Marawi	This study would significantly benefit the Maranao freshwater prawn fish farmers of Lanao Lake, and other fish farmers and private stakeholders, the Ministry of Fisheries and Aquatic Resources (MAFAR), the government agency responsible for the development, improvement, management and conservation of the countryâ€™s fisheries and aquatic resources in my country who wish to use the new technology in farming freshwater prawn. Also, MSU and academic community through this study, will be informed of the biofloc technology application to aquaculture where studies are still limited.	1-Sep-21	31-Aug-23	ONGOING	4,898,495	3,702,934
	Evaluating IMTA as an Approach to Disease and Environmental Management for Sustainable Culture of Penaeus monodon in Northern Mindanao (Organic Farming Systems for Disease and Environmental Management towards Sustainable Penaeus monodon Pond Aquaculture)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	This project will contribute in providing scientific-based technical strategies of improving the culture condition in P. monodon ponds using eco-based methods of production. This will also contribute in mitigating deteriorating environmental conditions and disease occurrence through biological population manipulation centering on IMTA and algal remediation. It is the ultimate goal of the project to evaluate and develop a straight forward protocol for best IMTA management practices that will assist in preventing disease occurrence and in rehabilitating the environment towards ecological balance in P. monodon aquaculture. Moreover, the aim is to evaluate the profitability IMTA that are yet to be clearly demonstrated. The long-term contribution of this study will be its beneficial impact on the revival of the P. monodon industry as well as generation of jobs and revenues from improved shrimp production in Mindanao. Likewise, the purpose is to develop IMTA techniques for sustainable P. monodon production.	â€¢Increased production by 10-15% from baseline production of 0.5-1.0 ton/hectare/year â€¢Soil and water quality profile in IMTA pond-based aquaculture systems in P. monodon â€¢Bio-economics of an IMTA pond-based shrimp farming/technology â€¢Biological pond profile (pathogenic and non-pathogenic microbial species, microalgal species) â€¢Pond-based IMTA protocol for P. monodon culture â€¢Reduced commercial feed cost of up to 30% from the baseline production of 60% of the total production cost, hence increase profitability â€¢Policy recommendation on the use of IMTA pond-based technology as management option in sustainable P. monodon production	MSU-Naawan	Shrimp farmers, LGU, BFAR, researchers, academe, other aquaculture stakeholders and practitioners	1-Oct-19	31-Mar-22	ONGOING	12,028,364	1,500,435

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
	GeM-Phil: Genetic Characterization of Macrobrachium populations in the Philippines for Broodstock Development and Seed Production	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Due to various human interventions like overexploitation, environmental pollution and habitat loss, the natural population of Macrobrachium species is declining. There is also a great deal of confusion over the exact identity of both wild and hatchery-bred M. rosenbergii stocks in the Philippines. The use of mtDNA genes, microsatellite markers and EST/Next gen sequencing data have been used to identify populations as well as to discover genes that code for important traits in Macrobrachium.This project will map the genetic resources of M. rosenbergii in the Philippines through comparison of the mtDNA sequences from shrimp collected from various places in the country and discovery of biomarkers related to growth and sexual differentiation. Through this project, it is envisioned that by identifying suitable populations of M. rosenbergii for subsequent broodstock development, a carefully laid out blueprint is implemented to ensure continuous production of good quality fry for the development of a sustainable aquaculture of M. rosenbergii in the Philippines.	4€¢Appropriate/Fit Macrobrachium rosenbergii strain will be identified, developed, produced, and maintained as quality broodstock by the project for potential freshwater prawn hatchery operators in Palawan4€¢High quality Macrobrachium fry will be produced and maintained by the project for selective breeding in Palawan4€¢Sufficient data to prove that Macrobrachium rosenbergii is an indicator species of good water quality	WPU	Freshwater prawn hatchery operators, Population geneticists, Freshwater prawn farmers, Researchers, and Policy makers	1-Oct-20	30-Sep-22	ONGOING	10,858,430	1,990,036
	Hatchery Development for Four (4) Indigenous Macrobrachium freshwater prawn species in Marinduque	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Among the recorded nine (9) naturally-occurring Macrobrachium species in Marinduque, there are 4 species with potentials for culture for their size, including M. australe, M. latimanus, M. lar, and M. latidactylus. These species are among the target species captured by local residents from the wild for domestic consumption and occasionally sold at the local market for extra income. This project is deemed to investigate some aspects of the reproductive biology of the freshwater prawn species, its fecundity, egg size, hatching rate and larvae survival rate in hatchery conditions with the hope that a new commodity for the local fishermen to produce can be identified, at the same time conserve and protect the remaining freshwater prawns in the wild.	4€¢Good quality berried female and matured male broodstock for each species4€¢Information on fecundity, hatching rates, larval survival and growth rates4€¢Manual on Customized Hatchery Protocol for the species that will perform best and have the potential for the grow-out phase	MSC	Student-interns; fisherfolk; student, faculty/staff researchers; LGU fishery technicians	16-Aug-21	15-Feb-23	ONGOING	4,100,000	3,596,496
	Improvement of Philippine Penaeus vannamei for Enhanced Growth and White Spot Syndrome Virus Resistance through Selective Breeding	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	The Philippines has been proud of its contribution to aquaculture improvement through the creation of GIFT tilapia by genetic selection. Similar system of approach will be employed in the current project to develop a superior P. vannamei strain that are selected for better growth and enhanced disease resistance against WSSV. Output of this work is intended for the use of the Philippine shrimp growers and for the Philippines to be engaged in the global trade of superior strains of P. vannamei broodstocks. The geographical location of the Philippines put this country to an advantage edge among the countries of the ASEAN region since this country serves as a transit hub of distribution of traded goods that could include shrimp broodstocks. The location of the Philippines permits easy access to Hawaii, mainland US and Guam to obtain founder stocks of P. vannamei broodstocks that could be subjected to further breeding selection for further strain improvements. As soon as the superior lines of P. vannamei broodstock be developed, the country could now engaged in marketing and distribution of this commodity to the ASEAN region including China which is considered as the major shrimp producing regions in the global context.	4€¢Culture of foundation families of P. vannamei from North America (USA) established in the Philippines 4€¢Optimized broodstock rearing, breeding and hatchery protocols for P. vannamai in the Philippines 4€¢P. vannamei broodstocks exhibiting traits of better growth performance and enhanced resistance against WSSV	UPV	The target beneficiaries of the project are the various sectors of the shrimp industry such as shrimp growers and hatchery operators.	1-Dec-18	30-Nov-22	ONGOING	29,881,443	5,184,481
	Intestinal Amino Acid Transporters as Indicators of Stimulatory and Inhibitory Effects of Dietary Proteins (Fishmeal, Soybean Meal and Copra Meal) on Amino Acid Absorption in Tilapia (O. niloticus)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	The proposed study will use nutrigenomics as a tool in the advancement of aquaculture nutrition research in the country and in filling knowledge gaps related to nutritional inadequacy problems in aquaculture species. Further extensive studies will lead to development of 4€¢elite feeds4€ or feeds that areespecially designed depending on the desired quality of fish (e.g. firmness of muscle) in the interest of either the farmers or the consumers. This will give new perspective in nutritional recommendations for aquaculture feeds thus will provide benefits to consumers, entrepreneurs, farmers, and the entire aquaculture industry.	1.Biological markers using gene and expression patterns 2.Recommended feed ratio based on gene expression 3.Gene expression method in evaluating protein/amino acids in aquafeeds 4.Recommendation for development of personalized and functional feeds.	UPLB	Knowledge acquired from this project will provide new insights on the effect of feed ingredients on fish that is important in the development of feed and improvement of feed quality. Outputs of this project could be used to complement, re-assess and improve conventional practices in aquaculture. Therefore, this project will primarily benefit the aquaculture feed industry, farmers, aquaculture sector. In addition, the academe (students and faculty researchers) and research institutes will also benefit from this project through thesis/dissertation and collaborations.	1-Jul-21	30-Jun-23	ONGOING	9,400,941	7,394,339
	Medium Chain Fatty Acids and Mannose Polysaccharide from Coconut as Dietary Supplement to Promote Growth and Improve Health of Cultured Saline Tolerant Strain of Tilapia nilotica	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	The proposed research work will involve the utilization of medium-chain rich coconut oil and Mannan polysaccharide as bioactive feed additive to improve health and promote growth of seawater Nile Tilapia. Optimization of dose and blend of Coconut oil with soyabean oil as dietary supplement to tilapia as to promote growth and improve health condition of this fish will be done. The work would also evaluate the production and use of Mannan polysaccharide from coconut and dos-response will be optimized as to maximize the effects of this bioactive additive in improving the growth performance of tilapia.	1.Optimum dose of coconut oil to promote better growth and efficient feed conversion in saline-tolerant strain of Oreochromis niloticus 2.Mannose polysaccharide with bioactivity to promote better growth of saline-tolerant strain of Oreochromis niloticus 3.Probiotic isolated from tilapia gut that act in tandem with medium chain fatty acids	UPV	Tilapia growers, fish cage culture operators, feed companies, consumers, LGUs, and entire aquaculture industry	1-Sep-20	31-Aug-22	ONGOING	4,797,498	1,098,574

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
	MicroBead Technology: Enhancing Fish Gut Nutrition through Efficient Delivery System and Functionality of Microencapsulated Probiotics for Aquaculture	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	The Philippine aquaculture industry has been growing for the past years and large-scale production facilities have been developed to meet the growing demand for these products, and to meet the current challenges relating to the ongoing globalization of trade and diversification. However, intensive aquaculture farming is accompanied by high operating costs that involve labor, feed, energy and disease control. Probiotics have been proven to be positive promoters of aquatic animal growth, survival and health. Current probiotic products commercially available in the market are typically powder or liquid forms however, application of these products in aquaculture farming are highly affected by adverse environmental condition such as water temperature, pH and salinity which may elicit a sub-lethal effect on microorganisms thereby reducing its functionality to the host. In order to address these limitations, MicroBead technology offers advantages over commercially-available probiotic products as it primarily aimed to provide functionality through efficient delivery system of probiotics to its target site, provide protection against harsh conditions of the environment and improve shelf-life storage of probiotics through barrier action against oxidation and other factors. The technology has a potential for commercialization and local value addition as it can be formulated, developed and mass-produced that can contribute to development in the aquaculture farming.The use of MicroBead probiotics can potentiate the benefits of the intensification and diversification of aquaculture farming as it offers viable alternatives for the generation of a higher-quality aquaculture product and served as an established management tool for efficient delivery of functional probiotics in improving gut health and environment quality.	Publication: Year 2 At least 1 publication in ISI/Scopus Journal At least 1 paper presentation in conferencesPatent: Year 2 At least 1 patent/utility model applied for the MicroBead productionProduct: Year 1 At least one (1) established process of producing MicroBead probiotics Â Â Year 2 One (1) product (MicroBead probiotics)People: Year 1 & 2 Mentored/Trained at least 2 researchersPlace: Year 2 MOU with SEAFDEC-AQD and ParSUPolicy: Year 2 The R&D results can be a baseline data for potential use in the aquaculture farming as well as in mass production and commercialization of this technology	UPLB	Local farmers engaged in aquaculture farming LGUs and cooperatives Feed manufacturers and compounders Food industry Academe	1-Jan-22	31-Dec-23	ONGOING	4,892,505	2,638,340
	Pilot Testing of the Green Mussel, Perna viridis Hatchery and Nursery Technology	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	The green mussel hatchery and nursery techniques were previously established with funding support from PCAARRD, DOST to address the national issue on low mussel production due to unstable supply of mussel spats. The said technology is now ready to be pilot tested to check its viability in a commercial scale. The pilot testing will be conducted in selected areas such as in Western Philippines University, Palawan and University of the Philippines Visayas, Miagao hatchery facilities where traditional mussel breeding grounds are present in the vicinity and in the regions. The pilot testing of a technology will likewise allow for further refinement of the protocol as necessary. The project will also address issues on biosecurity, food safety, sustainability and assurance of secured/healthy mussel spats for transplantation and grow-out farming.	1.Protocol for the hatchery and nursery of green mussel spat production in a commercial scale2. Cost analysis for the green mussel hatchery at different production technologies (hatchery to nursery, hatchery only, and nursery only)3. Hatchery-produced green mussel spats 4. Partnership with Western Philippine University (WPU), Palawan	UPV	Hatchery investors, local government units, educators/researchers	1-Dec-21	31-May-23	ONGOING	4,992,000	3,464,418
	Pilot Testing on the Use of Nano (Zeolite-silica) Composites in Freshwater Tilapia Production Systems	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Tilapias are important food fish cultured in developing countries. In the Philippines, tilapia is second only to milkfish in importance in terms of annual production. Tilapias can be grown easily, hardy and high-yielding. However, one of the challenges that tilapia industries are experiencing today includes competition on land use as a result of conversion of agri-fishery areas to residential and industrial purposes. Also, the advent of climate change resulting to global warming poses a problem and competition on water use between aquaculture, agriculture, domestic-use and industrial-use. In order to attain food security, intensification of aquaculture operation is the only foreseen solution on the dwindling capture fisheries from the wild. However, intensification has been resulting to several problems particularly in the deterioration of water quality which include the following: a) frequent incidences of fish mortalities due to diseases, and b) fishkill outbreaks due to fish exposure to water quality parameters outside their ideal required water quality levels. Among the solutions being applied in the industry are the following: a) the use of bioaugmentors to improve water quality, b) the use of recirculating aquaculture system, and c) application of organic/inorganic materials that would reduce acidity and toxic nitrites in the water. Since the use of charcoal has been a traditional practice in reducing toxic gases and substances in the air and water, the use of nanochar (nano silica) technology for water and soil quality improvement in aquaculture can be an environmentally sound and gender-responsive approach to solve problems caused by aquaculture operations.	1.Pilot tested nano (zeolite-silica) composites in freshwater tilapia production systems. 2.Evaluated the economic feasibility of using nano (zeolite-silica) composites in the grow-out production of tilapia in ponds. 3.Improved nano (zeolite-silica composite) 4.Accessible technology for the utilization of all farmers	CLSU	The target clienteles are: 1.Tilapia farmers specially those frequently affected with fish kill 2.Researchers 3.Educators 4.Extension workers 5.Students 6.All stakeholders regardless of gender (manager, middleman, retailers, etc.)	1-Jul-21	31-Dec-22	ONGOING	4,998,889	3,332,593
	Pilot Testing on the Use of Nanogold-based DNA Probe Rapid Detection Kit for Aeromonas hydrophila	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Emerging and re-emerging diseases in tilapia and other aquaculture species pose threat to the industry, food availability and human safety. Diagnosis of fish affected by bacterial or viral pathogens is a tedious procedure and requires knowledgeable individuals to do laboratory work and run the equipment. With the development of friendly rapid detection kit, the spread of disease can be easily contained. In like manner, a kitchen-type laboratory established within a farm or in any diagnostic centers can easily manage to perform the analysis.	1.Pilot tested the developed RDK from kitchen-type laboratories of cooperating SUCs 2.Evaluated the economic feasibility and viability of the developed detection kit 3.More refined and improved RDK	CLSU	1.Diagnostic laboratories (public and private) 2.Academic and research institutions 3.Tilapia Farmers	1-Jul-21	30-Jun-22	ONGOING	3,330,486	3,330,486
	Prevalence Monitoring of Selected Emerging Bacterial Pathogens on the Surface Water and Aquaculture of the Seven Lakes of San Pablo, Laguna, Philippines	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	The Seven Lakes of San Pablo, situated in the bustling city of San Pablo, are economically important as a source of food and as tourism spots.Â While the lakes remain an ecotourism spot and a channel for livelihood through aquaculture systems, the integrity of the lake is compromised. Humans may be exposed to a variety of disease-causing microorganisms in recreational waters. A meta-analysis found that the risk of contracting diarrhoea for non-swimmers was 35/1000, which rose to 59/ 1000 after swimming at beaches where the fecal indicator bacteria (FIB) Enterococcus spp. exceeded 35 CFU/100 mL of water (Arnold et al., 2016). Fecal pathogens, including those coming from humans and livestock and other emerging pathogens can cause diarrhoea, abdominal pain, cramping, nausea, vomiting and other zoonotic infections in healthy humans. The coliform group is used as an indicator of the sanitary quality of the water because its presence in the water body would suggest fecal contamination or would indicate the disease-producing potential of the water. Ideally, water should not contain any microorganisms known to be pathogenic or any bacteria indicative of fecal pollution.	Publication: Â Â At least 2 peer-reviewed journal publications will be targeted for this project.Patent: The isolated strains may be the subject for future vaccines as part of the next phase.Â Â Product: Isolated bacterial isolates, Lake Maps, Prevalence MapsPeople: At least 2 Undergraduate and 1 graduate students who will conduct their thesis within the domain of the projectPlace: This project will fortify strong partnerships among the University of the Philippines Los BaÑÃos, the City Government of San Pablo City, Laguna and the DOST- PCAARRD.Policy: Â Â Policy Framework for Microbial Quality for the Seven Lakes of San Pablo Resolutions and recommendations on the microbial quality of the lakes through SWOT, Cost-Benefit Analyses and Risk Management (Risk identification, Risk Characterization, and Risk Evaluation) in juxtaposition to the recreational and economic value of the lakes. The results of the analyses will also serve as a reference for mitigation controls through management systems and policy formulations.	UPLB	Â Â Local Government Units of San Pablo City Â Â Â Â Â Â Â Â Â Â The local government of San Pablo will gain information as to the microbioological status of the 7 lakes with respect to emerging waterborne microbial pathogens such as, coliforms, Salmonella sp, E. coli O157:H7 and others. This would put into perspective the current recreational, aquaculture, agricultural and other anthropogenic activities on and around the vicinity of the lakes vis a vis the impacts these activities make to the water quality of the 7 lakes. Ultimately, this information will guide the LGU in crafting mitigating measures, guidelines and policies to ensure water quality and safety for users. Â Â Consumers, Tourists and Lake Users Â Â Â Â Â Â Â Â Â Â Â The maintenance of good quality water will ensure the safety of people visiting the lake aspecially when some of the lakes such as Pandin and Yambo are open for swimming and other recreational activities. The information on the prevalence and sources of these pathogens, and whether human pathogens are also present in fish, will result in formulation of sound quality management and safety guidelines.Â Â Local Business Owners Â Â Â Â Â Â Â Â Â Â Â The findings and recommendations will assist local business owners in the effective marketing of their businesses with respect to microbiological safety of the lake. Furthermore, local agricultural industries will be able to know if they contribute as	1-Jan-22	31-Dec-23	ONGOING	4,969,622	3,807,261
	Product Quality Enhancements of Novel Dietary Synbiotic Materials and Pilot Field Application in Milkfish Hatchery-Nursery Seedstock Production	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Pilot testing of the project ...	1.Probiotic Fermentation Medium 2.Low-cost Endogenous Probiotic Powder 3.SB-E Aqualfeeds for Hatchery-Reared Milkfish Fry	LSPU	The results of this proposed project will provide science-based information on the potential use of the novel aqua-synbiotic materials	1-Jan-20	31-Dec-21	ONGOING	4,995,000	1,944,997

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
	Refinement of Milkfish Nursery Culture and Development of Efficient Juvenile Transport Techniques (Old Title: Lowering Mid-Cycle Losses in Milkfish Aquaculture through Refinement of Nursery Management and Transport Techniques)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	To support the industry, the DOST in 2013 funded research program entitled â€œEnhancement of Milkfish Broodstock Management for Production of Good Quality Fryâ€ that include projects on refinement of broodstock management to improve fry production as well as food enrichment of milkfish larvae and the adoption of the core-satellite hatchery schemes. Another DOST-funded program entitled Improved Grow out Technology for Sustainable Milkfish Industryâ€ focused studies on milkfish grow-out in both ponds and cages, feeds and feeding management including mechanization in milkfish grow out culture. Many of the factors contributing to low hatchery production (egg and fry) were identified and given solutions. However, the problems in the nursery phase of milkfish production was overlooked and was not given enough priority. Base on personal observations and farmer enquiry, about 50% of the milkfish produced in the hatchery are lost in the nursery stage on reasons like poor pond preparation, mortality as a result of stress due to transport, predation, etc. Normally, survival rate in the nursery averaged to a low of 20-40%. The loss incurred during transport from the nursery to grow-out ponds and especially to cages are not yet included. Thus, studies to improve survival in the nursery as well optimum conditions of transport from the nursery to the grow-out ponds and cages is essential to	1.Increased fingerlings survival in the nursery (from 35% to 70%); transport survival (at least 30% increase) 2.Identified and established the optimum size of milkfish for transport and stocking in ponds and cages 3.Protocol for standard transport techniques of various sized milkfish 4.Provide support in the establishment of the milkfish tuna bait industry	UPV	Milkfish fish farmers, researchers, extension workers, and farm hands	1-Apr-19	30-Sep-21	COMPLETED	4,921,051	836,986
	Refinement of Protocols for Captive Breeding and Larval Rearing of Ayungin (Leiopotherapon plumbeus)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Refinement of the captive breeding and larval rearing technology for Ayungin is necessary for the conservation of this species, which could potentially contribute to food security and sustainability of aquatic resources. Through captive breeding and stock enhancement, biodiversity in rivers and lakes can be revitalized, thus restoring native ecosystems. Ayungin is one of the first few endemic species studied to have high potential for captive breeding. The captive breeding technology for Ayungin was developed in the DOST-PCMARD-funded program â€œFish Ark Philippinesâ€ but problems on high larval mortality were observed. This project aims to refine and improve the technology by identifying possible factors for the high mortality of Ayungin larvae during the critical stage of development and increase their survival by improving their food and nutrition as well as rearing protocols.Â The primary goal is to develop breeding and larval rearing protocols for ayungin to increase their yield. This can be done through a series of controlled experiments which can identify optimal conditions and prevent high mortality in the early larval stage of Ayungin. Improvement of feeds will be done by exploring potential live plankton, feed enhancement protocols, and through development of suitable artificial feeds. At the end of the project, accessible and replicable protocols will be developed to ensure technology transfer to government agencies and local fish farm operators. This could potentially enhance Ayungin stock in the wild and may provide an additional source of livelihood for fishermen and aquaculturists	Publication: 1 ISI journal article publication and 1 local or 1 international paper presentation; Techno-bulletin on protocol; Promotional Material such as TV Interviews, newspaper articlesÂ Â Patent: Protocol on hatchery production, larval rearing and grow-out of AyunginProduct: NonePeople: 1 Graduate Student/ 2 Undergraduate Thesis Students, Training/Workshop of Researchers/TechniciansPlace: MOU with BFAR-IV-AÂ Policy:Policy recommendation on the conservation of Ayungin	UPLB	The project can help in the conservation of ayungin especially now that its wild catch has been reported to decline.Ã‚Â This project can also open a new path in fisheries research and inland aquaculture for ayungin, which could serve as potential source of income for fisherfolks.	1-Dec-21	30-Nov-23	ONGOING	5,000,000	2,970,799
	Role of Type VI Secretion System during Shrimp Infection of Vibrio spp. –causing Acute Hepatopancreatic Necrosis Disease (AHPND)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	This project will investigate the potential role of Type VI Secretion System encoded by Vibrio-causing AHPND during shrimp infection. It has been shown that AHPND is caused by plasmid-encoded binary toxins V. parahaemolyticus Photorhabdus insect-related toxins (PirAVP and PirBVP). However, little is known about the pathogenicity and it remains unknown whether other virulent factors are present that might play important roles during shrimp infection. Interestingly, comparative genome sequence analysis revealed that Type VI Secretion System (T6SS) is the differentiating factor between AHPND-causing V. parahaemolyticus strains (AHPNDVP) and non-AHPND strains. Only AHPNDVP strains encodes T6SS, the V. parahaemolyticus not causing AHPND does not have T6SS. T6SS is a nanomachine used by gram-negative bacteria to inhibit the growth and kill by injecting toxins into target bacteria or eukaryotic cells. To date, all of the studies on the disease-causing mechanism is on V. parahaemolyticus. Recently, however, other AHPND-causing Vibrio spp. were identified from affected shrimp populations, such as V. harveyi (Kondo et al., 2015), V. owensii (Lu et al., 2018), V. campbellii (Dong et al., 2017) and V. punensis (Restrepo et al., 2018). There is very limited AHPND-related information available for these strains. This proposed study aims to extend our understanding on how Vibrio spp. causing AHPND colonize and thrive in the shrimp.	Publication:Year 2 -Â 1 Research ArticleYear 3 -Â 2 Research Articles;Â IEC MaterialsPeople ServicesYear 1 - Trained staff:Â Â Â Â Â Â Â Â Â Â NFRDI: -Â 1 Science Research SpecialistÂ -Â 2 Project StaffÂ Â Â Â Â Â Â Â Â Â Â Â Â Â Â AS:Â -Â 1 PhD StudentÂ Â Â Â Â Â Â Â ÂÂ Â Â Â Â Â Â Â Â Â Â Â Â Â Â Â Â Â -Â Â 1 Research AssistantÂ Â Â Â ÂÂ Â Â Â Â Â Â Â Â Â Â -Â 2 undergraduate/ graduate students (OJT/ internship)Year 2 -Â Â Trained staff:Â Â Â Â Â Â Â Â Â Â NFRDI:Â Â Â Â Â Â Â Â Â Â -Â Â Â Â 1 Science Research SpecialistÂ Â Â Â Â Â Â Â Â Â -Â ÂÂ 2 Project StaffÂ Â Â Â Â Â Â Â Â Â - 30 Technical staff during the scientific symposiaÂ Â Â Â Â Â Â Â Â ÂÂ AS:Â Â Â Â Â Â Â Â Â Â -Â Â ÂÂ 1 PhD StudentÂ Â Â Â Â Â Â Â Â Â -Â Â ÂÂ 1 Research AssistantÂ Â Â Â Â Â -Â 2 undergraduate/ graduate students (OJT/ internship)Year 3 -Â Â Trained staff:Â Â Â Â Â Â Â Â Â Â NFRDI:Â Â Â Â Â Â Â Â Â Â -Â Â Â Â 1 Science Research SpecialistÂ Â Â Â Â Â Â Â Â Â -Â ÂÂ 2 Project StaffÂ Â Â Â Â Â Â Â Â ÂÂ AS:Â Â Â Â Â Â Â Â Â Â -Â Â ÂÂ 1 PhD StudentÂ Â Â Â Â Â Â Â Â Â -Â Â ÂÂ 1 Research AssistantÂ Â Â Â Â Â -Â 2 undergraduate/ graduate students (OJT/ internship)Places and PartnershipYear 1 -Â MOA with Academia Sinica,Â Â Â Â Â Â Â -Â Â Research Institute for Aquaculture No.1, Ministry of Agriculture and Rural Development, VietnamÂ Â Â Â Â Â - SEAFDEC Aquaculture DepartmentYear 2&3 -Â MOA with Academia Sinica,Â Â Â Â Â Â Â -Â Â BFAR Fish Health LaboratoryÂ Â Â Â Â Â - SEAFDEC Aquaculture Department	DA-NFRDI	P. vannamei and P. monodon farms/growers, Aquatic animal health researchers, T6SS scientist/research community, NFRDI technical staff	1-Dec-21	30-Nov-24	ONGOING	9,675,131	4,631,652
	Utilization of Marine Diatoms as Dietary Additives to enhance the Omega-3 Fatty Acid Profile of Seawater Strain Tilapia nilotica	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	The proposed research work will involve the optimization of marine diatoms supplementation to tilapia diets as to increase the levels of EPA and DHA incorporation to tilapia flesh. This research will assess at what period of grow-out the algae supplemented feed will be applied as to maximize the incorporation of EPA and DHA in tilapia tissue. Optimization of dose and frequency will also be done as to optimize the efficacy of the strategy in manipulating the fatty acid profile of Tilapia. Biological growth performance and the biochemical changes in flesh of these aquatic animals fed with the marine diatoms supplemented diets will also be evaluated.	1.Optimized dietary inclusion levels, frequency and period of application of Marine diatoms supplement to attain maximum bioaccumulation of EPA and DHA in saline tilapia flesh. 2.Diets containing Marine diatoms and its influence on carcass composition, sensory quality and health of tilapia.	UPV	Fisher folks/traders/feed industry; researchers/scientists, the general public and science in general.	1-Sep-20	31-Aug-22	ONGOING	4,911,490	1,202,872
Assisted Reproduction, Nutrition and Health Interventions for Enhancing Dairy Cattle Productivity and Milk Safety (Old Title: Science and Technology-based Interventions to Improve Dairy Cattle Productivity and Profitability in the Philippines)	Project 1. Application and Improvement of Embryo Transfer (ET) and Artificial Insemination Technologies as Tools Toward Achieving the Desired Number of Genetically Superior Breeder Dairy Cattle(Old Title: Value Chain Improvement and Sustainability for Dairy Cattle Value Chain Players)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	The Philippine dairy industry has been trying to increase its volume of milk produced for the past few years to cater the increasing demand of the Filipino people. However, increase in volume of milk produced has been slow with the low number of good quality dairy stocks as one of the main reasons. Introduction of Embryo Transfer and artificial insemination technologies to Philippine dairy farms are possible solutions to improve the quality of our breeding stocks to increase the production of good milk producers at a faster and more efficient rate given the long generation interval of dairy cattle. Embryo transfer (ET) is a technique wherein embryos are collected from superior donor cowsâ€™ reproductive tract and transferred to other females which will serve as surrogates until end of gestation. With this, we will be able to get multiple calves out of one donor cow in a year compared to only one or two calves.	ï‚· 3,555 Pregnant dairy heifers/ cows through ET and AI ï‚· 3,200 hd genetically improved calves ï‚· Technical Manual on improved ET and AI technologies ï‚· Trained personnel to perform ET and AI	UPLB, CagSU, BISU, CMU, USeP, CLSU,	Dairy farmers ï‚· Researchers ï‚· Students	1-Dec-18	30-Nov-23	ONGOING	91,154,627	4,109,434

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
Assisted Reproduction, Nutrition and Health Interventions for Enhancing Dairy Cattle Productivity and Milk Safety (Old Title: Science and Technology-based Interventions to Improve Dairy Cattle Productivity and Profitability in the Philippines)	Project 5. Establishment of a Farm to Consumer Milk Quality and Safety Assurance Systems(Old Title: Establishment of Milk Quality and Safety System from Farm to Consumers)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	At present, there are no available data on the quality of raw milk and dairy products that are produced locally. Neither there are locally established management and handling systems in the milking parlor to the processing plant and outlet stores that could ensure food safety. The proposed study will assess existing milking, handling, processing, transport and retailing practices of milk and milk products in the Philippines. Critical control points will be identified and proper intervention technologies will be developed to address issues on food safety.	¿ Profile on the quality of the locally produced raw and processed dairy products. ¿ Manual for the production of safe and quality milk. ¿ Interventions to address issues on milk safety.	UPLB	¿ Dairy cattle farmers in the target regions ¿ Dairy processors ¿ Distributors of raw milk and processed dairy products	1-Dec-18	30-Nov-21	COMPLETED	9,256,459	1,390,252
Strategic Interventions for Sustainable Production of Marinduque Native Pigs (Old Title: S&T Based Intensification and Pilot Demonstration of Integrated Services and Systems to Native Pig Production in Marinduque)	Project 1. Improvement of productive and reproductive performance of nucleus Marinduke breeders(Old Title: Enhancement of Nucleus Breeding Operation for Ensured Supply of Grandparental Stock of Marinduke Pig)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	This proposed R&D program is an offshoot of the on-going R&D program on Conservation, Improvement and Profitable Utilization of Philippine Native Pig that improved the reproduction and production performances of Marinduke pig, an endemic native pig in Marinduque province. Moreover, this program is one of the priorities R&D to expand the benefits derived from previous native pig R&D and to further enhance the livelihood of native pig farmers in the rural farming communities.	â€¢ Breeding and selection protocols/strategies for improved litter size, growth, carcass quality, and adaptation ability â€¢ Economic and breeding values of litter size, growth, carcass quality, and adaptation ability â€¢ Predictive production and reproduction parameters and models â€¢ 250 Breeder Marinduke pigs â€¢ Performance data of breeder Marinduke pigs in the nucleus farm	MSC	â¦ Native pig farmers and Entrepreneurs â¦ Native pig consumers â¦ Institutional markets â¦ Academic professionals (Researchers and Faculty) and students â¦ Development planners and policy makers	1-Jul-18	30-Jun-22	ONGOING	15,939,040	3,952,293
Strategic Interventions for Sustainable Production of Marinduque Native Pigs (Old Title: S&T Based Intensification and Pilot Demonstration of Integrated Services and Systems to Native Pig Production in Marinduque)	Project 2. Performance and profitability testing of Marinduke pig at farmers field(Old Title: Proj. 2 Establishment of Multiplier Farms for Mass Production of Parental Stock and Commercial Stock of Marinduke Pig)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	This proposed R&D program is an offshoot of the on-going R&D program on Conservation, Improvement and Profitable Utilization of Philippine Native Pig that improved the reproduction and production performances of Marinduke pig, an endemic native pig in Marinduque province. Moreover, this program is one of the priorities R&D to expand the benefits derived from previous native pig R&D and to further enhance the livelihood of native pig farmers in the rural farming communities.	â€¢ Institutional and private multiplier farms established for mass production of parental stocks â€¢ Production and reproduction performance data of Marinduke pig under multiplier farms â€¢ Breeding and selection strategies (selection criteria and mating system) applicable in multiplier farms â€¢ Data on economic and breeding values of litter size, growth, carcass quality, and adaptation ability under multiplier farms â€¢ Information on genetic combining ability and degree of heterosis in commercial stocks (terminal stocks) of Marinduke pig â€¢ Performance data of breeder Marinduke pigs in the nucleus farm â€¢ Parental/commercial stocks of Marinduke pig â€¢ Slaughter native pig for Lechon â€¢ Data on socio-economic contribution of native pig production in Marinduque â€¢ Linkages and networks established among academic and industry partners â€¢ Mobile application for online marketing of native pigs â€¢ Conducted technology and livelihood seminars and trainings â€¢ Trained MSC R&D workers, farmers, private entrepreneurs and LGU agri workers â€¢ IEC materials on native pig production, forage crop production, and feed quality enhancement technology	MSC	â¦ Native pig farmers and Entrepreneurs â¦ Native pig consumers â¦ Institutional markets â¦ Academic professionals (Researchers and Faculty) and students â¦ Development planners and policy makers	1-Jul-18	30-Jun-22	ONGOING	5,905,329	1,181,249
Strategic Interventions for Sustainable Production of Marinduque Native Pigs (Old Title: S&T Based Intensification and Pilot Demonstration of Integrated Services and Systems to Native Pig Production in Marinduque)	Project 3. Sustainable production of feeds in support to Marinduke pig production (Old Title: Proj. 3 Large-scale and Consolidated Feed Resources Production and Range Management System for Marinduke Pig)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	This proposed R&D program is an offshoot of the on-going R&D program on Conservation, Improvement and Profitable Utilization of Philippine Native Pig that improved the reproduction and production performances of Marinduke pig, an endemic native pig in Marinduque province. Moreover, this program is one of the priorities R&D to expand the benefits derived from previous native pig R&D and to further enhance the livelihood of native pig farmers in the rural farming communities.	â€¢ Nutrient requirement and feed formulations for Marinduke pig â€¢ Established fiveâ€hectare forage plantation in the nucleus farm, and at least one-hectare forage plantation in multiplier farms â€¢ Data on land carrying capacity and biomass production of forage crops in multiplier farms â€¢ Silage processing and other nutrient-enhanced feed resources technologies for Marinduke pig	MSC	â¦ Native pig farmers and Entrepreneurs â¦ Native pig consumers â¦ Institutional markets â¦ Academic professionals (Researchers and Faculty) and students â¦ Development planners and policy makers	1-Jul-18	30-Jun-22	ONGOING	13,895,079	1,745,339
Surveillance and Molecular Epidemiology of Economically and Public Health Important Animal Diseases in the Philippines	Proj. 1 Development of Surveillance System of African Swine Fever (ASF) Virus in Farm Environment and Fomites of ASF-Affected Swine Farms in Luzon, Philippines: An Added Tool for ASF Sentinel, Repopulation and Recovery Programs	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	This project is composed of a multidisciplinary team of veterinarians, epidemiologist, virologist, biomathematician, and molecular biologist to investigate the epidemiological distribution patterns of environmental contamination of ASFV in ASF-affected farms in select regions in Luzon, Philippines.	TARGET ACCOMPLISHMENTS a.Epidemiologic data of ASFv based on sample types and types of farm b.Optimized sampling approach and laboratory procedures for ASFv detection in swine farms c.Prototype of Sampling Protocols and Laboratory Procedures of the Surveillance System d.Manual on Surveillance System for Environment Samples and Fomites EXPECTED OUTPUTS a. Publication: Submission of one (1) publication in peer-reviewed scientific journal and 1 field manual: Initial and Final Field Manual on Surveillance System for African Swine Fever (ASF) Virus in Farm Environment and Fomites of ASF-Affected Swine Farms in Luzon, Philippines: An Added Tool for ASF Sentinel, Repopulation and Recovery Programs b. Patent/Intellectual Property: ASF Surveillance System using Farm Environment and Fomites for Sentinel, Repopulation and Rebuilding Programs that can be filed for registration as Utility Model c. Product: 1. Sampling protocols and initial epidemiological data (Year 1). 2. Initial and Final Biosecurity Recommendations for Farm Adoption d. People Service: With the ASF surveillance system that will be produced by the data gathered and analyzed by the research team, swine farms can have higher probability of a safe and successful repopulation, thus accelerating the recovery of the Philippine hog industry. This will ensure the availability as well as the affordability of pork and pork products. With seminars and program materials, at least 100 veterinarians, researchers, policy makers and farmers can benefit with the information on policy and biosecurity recommendations which can be applied to other farms affected by ASF. Engaged 2 undergraduate and 1 MS students in research.	UPLB	The target beneficiaries of this program are swine farmers, veterinarians, researchers/scientists, government agencies, veterinary and animal science students, veterinary pharmaceuticals and vaccine companies, veterinary diagnostic companies, government and private research institutions.	1-Oct-21	30-Sep-23	ONGOING	12,994,635	9,139,804

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
Surveillance and Molecular Epidemiology of Economically and Public Health Important Animal Diseases in the Philippines	Proj. 2 Molecular Detection and Transmission Risk Assessment of African Swine Fever Virus (ASFV) in Raw Meat and Processed Pork Products in the Philippines	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Detection of the virus in raw and processed pork products and their possibility of disease transmission have not been extensively studied in the Philippines. Therefore, understanding the epidemiology and assessment of ASFV risk of local transmission through these raw and processed pork products are essential in the implementation of a targeted measure of prevention and control. Hence, this project proposal aims to detect ASFV molecularly in raw and processed pork products from backyard, commercial and wild pigs in select local markets.	TARGET ACCOMPLISHMENTS a.Quantitative data on the detection profile of ASF in raw and processed pork products in the Philippines. b.ASF frequencies among meat and meat products sold in selected provinces in the Philippines. c.Quantitative data and formulated risk matrix and risk categories of sampled provinces in the Philippines. d.Geographical distribution map of ASFV-contaminated raw and processed pork products in the Philippines to be submitted in BAIâ€™s PhilAHIS database. EXPECTED OUTPUTS Publication Publishable manuscripts (at least 2) of the epidemiological surveillance of ASF in raw and processed pork products using qRT-PCR, as well as the risk assessment of ASFV-positive raw and processed pork products, will be submitted for peer review to a journal publication. Patent/Intellectual Property: (N/A) Product: Sampling protocols and initial epidemiological data (Year 1). Final Epidemiological data and geographic distribution map of ASFV-positive raw meat and processed pork products (Year 2). People Service The researchers aim to share the knowledge that will be gathered from the proposed study to at least 100 veterinarians and researchers of DA-BAI and Regional Animal Disease Diagnostic Laboratories (RADDLs) in the country who are working on animal disease surveillance and diagnosis. The data that will be generated from the proposed study will inform the researchers of the disease's geographical patterns and will be an invaluable tool in developing an ASF diagnostic workflow or framework. In addition, the researchers also hope to conduct seminars to at least 50-100 farmers and stakeholders as well as the concerned public to raise awareness about ASF emphasizing the surveillance results and on the risk of possible ASFV transmission to domestic pigs including wild pigs through ASFV-contaminated raw and processed pork products. It would	UPLB	The target beneficiaries of this program proposal are swine farmers, veterinarians, researchers/scientists, government agencies, veterinary and animal science students, veterinary pharmaceuticals and vaccine companies, veterinary diagnostic companies, government and private research institutions.	1-Oct-21	30-Sep-23	ONGOING	12,150,200	6,415,075
Surveillance and Molecular Epidemiology of Economically and Public Health Important Animal Diseases in the Philippines	Proj. 3 Molecular detection and serological profiling of Swine Influenza and Classical Swine Fever in Backyard Farms in the Philippines	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	In line with the objectives of the Philippine Inter-agency Committee on Zoonoses and the National Task Force on Animal-Borne Diseases, the data obtained from this study will contribute in the preparation of the framework for managing emerging diseases that affect animals and humans in the country (DA Advisory, 2020).	TARGET ACCOMPLISHMENTS a) Quantitative data on the detection profile of CSFV and SIV in backyard growing pigs in the Philippines. b) Quantitative data for risk assessment of CSFV and SIV transmission in backyard growing pigs in the Philippines. c)Disease profile information database (farm demographics, epidemiological status, economic costs) of CSFV and SIV in backyard pig farms in the Philippines. a)Publication-Submission to journal publication of at least 2 publishable manuscripts: 1. Epidemiological surveillance of CSFV and SIV in selected backyard growing pigs using qRT-PCR, as well as 2. Risk assessment of CSFV and SIV transmission. b)Patent/Intellectual Property: (N/A) c)Product-Sampling protocols and initial epidemiological data (Year 1). Final epidemiological data and serologic profiles of CSFV and SIV-positive samples (Year 2). d)People Service- The researchers will share the knowledge and learnings from the SI and CSF studies to at least 100 veterinarians, researchers and policy makers of the Department of Agriculture, Bureau of Animal Industry and Regional Animal Disease Diagnostic Laboratories who are working on disease diagnosis and surveillance. The scientific data that will be obtained will aid both the scientific community as well as the policy-makers in the crafting of measures to prevent and control CSF and SI outbreaks based on the geographical distribution maps generated. Seminars and fora will be organized to provide knowledge and information on the molecular epidemiology and risk assessment of CSF and SI to at least 100 farmers, stakeholders and students. Engaged 2 MS students in research. e)Place and Partnership- Procurement and acquisition of laboratory equipment and improvement of laboratory facilities. Collaboration between UPLB and LGUs and DA-BAI will be strengthened. f)Policy- The involved government agencies, DA-BAI and LGUs, will be able to use the gathered data in the preparation and implementation of strategies to mitigate, if not prevent outbreaks of the economically-devastating CSF, and the public health threat of SI.	UPLB	The target beneficiaries of this program proposal are swine farmers, veterinarians, researchers/scientists, government agencies, veterinary and animal science students, veterinary pharmaceuticals and vaccine companies, veterinary diagnostic companies, government and private research institutions.	1-Oct-21	30-Sep-23	ONGOING	13,960,476	6,956,663
	Detection of Estrus (DOE) Project: Development of a Wearable Goat Peak Estrus Sensor	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	The estrous monitoring device for goats is a wearable wireless sensor prototype that will detect changes in temperature, conductivity and acidity of the fluid discharge in the doe's vagina that will signal the best time to inseminate. Data will be transmitted wirelessly through an android software application to computer software operated by the farm manager.	Patents: 1. Wearable device 2. Integration and use of sensors Products: 1. One (1) working prototype of the wearable sensing device with integrated electronic connection platform 2. One (1) android mobile phone application design that can receive and display the data transmitted from the wearable sensor Publications: 2 conference papers and high impact journal publications Places and partnerships: 1 MOU with CVSRRC-ISU	DLSU	Commercial Goat Breeders and Farms- direct and economic benefit Academic community- new research opportunities in medical devices development	1-Jan-19	31-Dec-21	ONGOING	8,159,575	201,600
	Development of Caraga Black Native Chicken through Selection and Breeding as Potential Niche Product of Caraga Region	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	The Philippine native chicken industry has an economic potential contribution for farmers and entrepreneurs who engaged in native chicken raising which is a potential niche in the region. With its high demand in poultry meat due to its taste, texture, health benefits, and aroma, its supply are very limited within the region. Productivity, feed efficiency, availability of breeding stocks, and cost effectiveness are factors that will affect the production and management system. In addition, its major challenges are climate change where environmental conditions are extreme affecting performance in the production system, thus reducing its productivity. With the development of Caraga black native chicken, it can strengthen its capacity and capability in terms of productivity and efficiency through proper breeding and selection. Moreover, Caraga black chicken can provide a healthier option to consumers. The project is expected to produce breeding true-to-type population of black native chicken which is resilient to climate change condition in Caraga and can perform good traits in growth, hatchability, taste preference, and disease tolerance. These can also serve as genetic pool where target beneficiaries can avail on it through dispersal program. Target users of the generated output of the study are; farmers, peopleâ€™s organizations, academe and researchers.	Publication ¿ Two (2) scientific journal publications (IS/CHED refereed) (Y2) ¿ IEC materials on technology options of Caraga black native chicken breeding and production (Y2) ¿ Presentation of results to scientific for a (Y2) ¿ Caraga black native chicken breeding and production training module (Y2) Patents ¿ Copyright of IEC materials developed (Y2) ¿ Trademark registration of Caraga black native chicken (Y2) Product ¿ 500 breeder Caraga black native chickens (Y2) in each station ¿ Caraga black native chicken breeder flock with at least 80% uniformity established in 2 units (Y2) ¿ 2,000 hd quality Breeder stocks of Caraga black chicken (Y2) People Services ¿ 50 farmer entrepreneurs trained in science â€" based native chicken breeding and selection (Y2) Places and Partnerships ¿ At least 20 Materials transfer agreements (MTA) with adopters of Caraga black native	CarSU, DA-CARAGA	¿ Native chicken raisers in Caraga Region and nearby provinces. ¿ Native chicken domestic and institutional consumers ¿ Faculty, researchers, students, NGOâ€™s, Cooperatives and other organizations who wish to engage in native chicken production ¿ Native chicken enthusiast in the Province and in the Region.	1-Jul-19	31-Dec-21	ONGOING	5,317,457	850,283
	Development of Philippine Signature Muscovy Duck Breed	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Specifically, the project aims to develop the development of Philippine signature Muscovy duck breed that will support sustainability of quality breeder stocks leading to availability of duck meat supply in support to scarcity of pork brought about by ASF. This project also promotes livelihood to smallholder farmers thru Muscovy duck meat production and other potential duck meat specialty products.	At the end of four years, the project is expected to deliver the following: â—2,000 stable breeding true-to-type Philippine Muscovy ducks with predictable production performance and consistent product quality (Y2 and Y3); â—Quality breeder duck production and distribution systems developed (Y3 and Y4) â—At least 2 private breeder farms engaged in breeder Muscovy duck production (Y4) â—Nutrient composition and sensory characteristics of Muscovy duck meat (Y4)	IFSU, BAI	â—Ifugao and Quezon local farmers â—Day-old duckling, slaughter and ready to lay pullet producers â—Researchers	1-Apr-21	31-Mar-25	ONGOING	19,707,422	5,273,130
	Development of Real-time Ultrasound Scanning and DNA Marker Selection Protocols for Meat, Carcass and Fertility Traits of Philippine Native Pig	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	This project will develop a selection protocol utilizing real-time ultra sound and DNA marker technology as tools for selection of breeding animals to improve the production and reproduction performance of the native pig to benefit the native pig farmers and the swine industry.	â— Established genetic testing protocol using DNA marker technology for selected traits for use in breeding program. â— Established protocol for live animal scanning for loin eye area and intramuscular fat composition for use as selection tool in animal breeding program and in meat quality evaluation prior to sale of live animal. â— Established a genetic evaluation model that combines estimated breeding values and genomic information for selection/ranking of individual breeding animals. â— Contribute to increase in reproduction performance based on litter size at birth from 8.0 to 10.0 and improved the farrowing index from 1.7 to 2.0	PCC	¶% Swine industry (in general) ¶% Native pig breeder farms ¶% Academe and researchers	1-Apr-19	31-May-22	ONGOING	12,734,782	2,026,473

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
	Establishment of the Batanes Native Pig Breeding Herd	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	To boost the native pig production in Batanes, the Batanes State College through its agriculture department, intends to implement an R&D project to develop breeding-true-to-type populations of Batanes native pigs. This is to realize the potentials of the native pig in contributing to the country's attainment of food security, agricultural growth, and in providing livelihood opportunity not only for the Ivatan people but for the Filipino in general.	Publication: At least two papers on the production system of native pigs in Batanes, phenotypic characteristics and genetic diversity of Batanes native pigs Production guide on Batanes native pig raising Breeding goal and selection criteria for Batanes native pig Patent: NA Â¸Â Product: Batanes native pig breeder animalsPeople: Farmers, Agriculture Department, and partner agencies will receive technical knowledge and trainingPlace: Partnership with LGUs in Batanes ProvincePolicy: Policy on breeding and conserving the unique genetics of native pigs in Batanes	BSC	Researchers, professors, students, and swine breeding practitioners Native pig farmers Native pig consumers Institutional markets Â¸Â	1-Nov-21	31-Oct-24	ONGOING	5,000,000	2,154,128
	Integrating S&T Interventions with Common Farm Practices to Ensure Quality and Safety of Locally-Produced Cow's Milk (Enhancing the Handling and Packaging Technologies of Locally-Produced Cow's Milk)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	The project will help the dairy farmers minimize milk spoilage and wastages while ensuring the quality of the milk produced in the farms and the it will be safe for the consumers. It will reduce milk deterioration attributed to long storage and shifts in milk temperature because, as practiced by most far-flung farms, milk is stored at freezing temperatures and removed from freezers overnight to be delivered to the processing plant on the following day. The study will be integrating S&T technologies that will minimize milk contamination and keep the consumers safe from the ill effects these contaminations.	At the end of two years, the project is expected to deliver the following: 1.Information on fresh milk quality as influenced by production practices, handling, packaging and marketing in Northern Mindanao 2.Reduced milk wastage due to spoilage by 80% 3.Validated technologies on milk handling, storage and packaging that are suitable for dairy farmers in Northern Mindanao	USTP	The following entities are the target beneficiaries that would potentially benefit from the project. â€Local Government Units â€Milk plants and processors â€Dairy farms â€Schools implementing the milk feeding program â€People in the community	1-Jun-21	31-May-23	ONGOING	9,506,881	7,346,279
	Optimizing Boar Sperm Cryopreservation Towards Effective Industry Utilization and Genetic Conservation	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	This project is a solicited proposal to respond to the need of the swine industry as part of their efforts to mitigate the impacts of ASF. This project was conceptualized during the industry consultation meeting conducted with the swine breeder farms and animal science researchers. The objective of this project is to proactively conserve the genetics of superior boars from local swine breeder farms to ensure availability of desired genetics for immediate and future use by the local swine industry. The establishment of a technology on the use of frozen-thawed semen in swine artificial insemination is vital in the recovery and repopulation efforts of the local pig industry.	Year 1 â—Boar semen cryopreservation laboratory established (with additional funding requirement for facilities enhancement). â—Well-defined linkages and coordination with cooperating swine breeder farmers. â—Optimized boar semen cropreservation protocol. Year 2 â—Developed boar semen cryopreservation protocol â—Research data from experimental boar semen before and after cryopreservation. â—Publishable manuscripts: â—¦Boar semen cryopreservation protocol optimized for the Philippine breeder swine industry. â—¦Baseline data on the semen quality profile between fresh chilled and frozen-thawed boar sperm from different swine breeds.	VSU	â—Swine breeder farms â—Commercial AI companies â—Commercial swine farms â—Academe and R&D stations â—Swine organizations/associations â—Government policy makers and program implementers	1-Aug-21	31-Jan-23	ONGOING	4,998,562	4,383,774
	Semen Quality Evaluation of the Philippine Native Boar	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	With pigs providing as much as 40% of the global meat consumption [1] boasting from steady economic growth and a robust meat demand in many countries [2], pig farming is a major contributor to a sustainable food production. Sustained efforts for continued improvement of the reproductive performance of breeder boars are required to increase reproductive efficiency and production potential in swine operations.	Year 1 â€Collection & optimization of semen evaluation protocol â€Capacity building of staff at 6 native pig R&D stations â€Semen evaluation expertise developed â€Well-equipped swine semen laboratory Year 2 â—Semen and sperm characteristics, environmental factors affecting semen quality, and Philippine native boar fertility information â—Selection criteria for Philippine native boars â—Philippine native boar selection model â—4 Publishable manuscripts â—¦Empirical standards and semen quality profile of the seven Philippine Native Pig (Boar) Groups â—¦Epidemiological investigations on the breeding soundness of the seven Philippine Native Pig (Boar) Groups â—¦Prevalence of and risk factors associated with potential bacteriospermia in Philippines Native boar semen â—¦Correlation between seminal plasma components and semen quality characteristics of the Philippine Native Boars	VSU	¡Swine industry (in general) ¡Native pig breeder farms ¡Academe, pig research networks and LGU's	1-Jul-20	30-Jun-22	ONGOING	4,921,566	379,356
	VALIDATION OF MILK PRODUCTION TECHNOLOGIES IN SMALL DAIRY GOAT FARMS	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	This proposal was conceptualized to respond to the need to provide livelihood to our small farmers in the countryside and also to produce more food for the Filipino people.	â€Goat breeding, feeding, healthcare and management, milk handling and processing technologies validated â€Innovations on R&D derived technologies developed (by incorporating best farm practices of successful dairy goat farms) â€Feasibility of small dairy goat farm enterprise evaluated	DOST-VII	â€Dairy goat farmers â€Academe Researchers and students	1-Aug-21	30-Jul-23	ONGOING	4,600,000	3,285,092
Attaining sustainability in the fisheries for sardines and other small pelagic fish off the Zamboanga Peninsula (v. 2021)	Proj 3. Spatial patterns in the fisheries for sardines, their fry, and associated small pelagic fish off the Zamboanga Peninsula	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The proposed program builds on the results of the first phase of investigations of the Zamboanga Upwelling System and the fisheries it supports, and seeks to provide answers to the major questions arising from these results, particularly those concerning maturity, spawning, early stage growth and recruitment, the fry fisheries, and the role of sardines as a key species in the trophic structure of the ecosystem and how its fisheries affects associated small pelagic stocks. In addition, the new studies cover the entire Zamboanga Peninsula (East Sulu Sea) to examine more closely the coupling of North and South Zamboanga, as suggested by the results of previous studies.	Baseline information on the composition, distribution, abundance of fry caught by various gear types will be established and will be used to polish the existing FAO of the sardines fishing ban in Zamboanga PeninsulaMarketing channels of sardine fry will be determined, as well as issues involved can be addressed *Options* for interventions in flow of material from fishers to market.Ecologically important areas for different life stages of the small pelagic resources are determined and will be used to polish the existing FAO of the sardines fishing ban in Zamboanga Peninsula	JRMSU	Local commercial and municipal fisheries sector, fisheries stakeholder and consumers, regional BFAR and NSAP, and academe	15-Nov-21	14-Nov-24	ONGOING	11,484,492	4,930,344

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
Attaining sustainability in the fisheries for sardines and other small pelagic fish off the Zamboanga Peninsula (v. 2021)	Proj. 1 Early Life Dynamics and Reproductive Capacity of Sardinella lemuru and Associated Small Pelagic Fish off the Zamboanga Peninsula (Life history, recruitment and trophic role of Sardinella lemuru off the Zamboanga Peninsula)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The proposed program builds on the results of the first phase of investigations of the Zamboanga Upwelling System and the fisheries it supports, and seeks to provide answers to the major questions arising from these results, particularly those concerning maturity, spawning, early stage growth and recruitment, the fry fisheries, and the role of sardines as a key species in the trophic structure of the ecosystem and how its fisheries affects associated small pelagic stocks. In addition, the new studies cover the entire Zamboanga Peninsula (East Sulu Sea) to examine more closely the coupling of North and South Zamboanga, as suggested by the results of previous studies.	1—Science-based harvest control reference points for the dominant species of sardines and key small pelagic species off the Zamboanga peninsulaâ—Evaluation of length-based growth models (vs age based) and applications to management of other stocks in the countryâ—MS Biology/Fisheries graduate specializing on sardine population biologyÂ â—Research staff with expertise on fisheries biology and managementâ—Enhanced understanding of the reproductive capacity of the stock as basis for managementâ—Management scenario options for the small pelagic fisheries off Zamboanga Peninsulaâ—Ecosystem model that may be applied to other fishing grounds in the country	UPV	Local commercial and municipal fisheries sector, fisheries stakeholder and consumers, regional BFAR and NSAP, and academe	15-Nov-21	14-Nov-24	ONGOING	11,474,842	4,255,743
Attaining sustainability in the fisheries for sardines and other small pelagic fish off the Zamboanga Peninsula (v. 2021)	Proj. 2 Trophic Role of Sardinella lemuru off the Zamboanga Peninsula	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The proposed program builds on the results of the first phase of investigations of the Zamboanga Upwelling System and the fisheries it supports, and seeks to provide answers to the major questions arising from these results, particularly those concerning maturity, spawning, early stage growth and recruitment, the fry fisheries, and the role of sardines as a key species in the trophic structure of the ecosystem and how its fisheries affects associated small pelagic stocks. In addition, the new studies cover the entire Zamboanga Peninsula (East Sulu Sea) to examine more closely the coupling of North and South Zamboanga, as suggested by the results of previous studies.	Â Â Â Â Â Â Â Â Â Science based information as input to policy on:Â§Â Food web of sardine and other component small and large pelagic speciesÂ§Â The protection of feeding or nursery grounds of sardines in Northern Zamboanga PeninsulaÂ Â Â Â Â Â Â Â Â MS Marine Biology graduate specializing on the role of sardines in food webs off Northern Zamboanga PeninsulaÂ Â Â Â Â Â Â Â Â Research staff with expertise on trophic analysis in Philippine pelagic ecosystem using C, N and O stable isotope and stomach content analysis, and predator-prey and pelagic ecosystem Ecopath with Ecosim (free software) simulation modelingÂ Â Â Â Â Â Â Â Â Enhanced understanding of sardine feeding interactions (predator-prey and competitive relationships)Â Â Â Â Â Â Â Â Â Management scenario options for the small pelagic fisheries off Northern Zamboanga Peninsula	MSU-IIT	â€¢Regional and National BFAR, NSAP, NFRDI â€¢Local commercial and municipal fisheries sector â€¢Fisheries stakeholder â€¢Sardine run tourism industry â€¢Academic institutions offering marine sciences â€¢Sardine and mackeral canning and bottling industries â€¢Sardine and small pelagic fisher folks â€¢Marine Science and Fisheries Students (BS/MSc/PhD)	15-Nov-21	14-Nov-24	ONGOING	9,923,747	3,949,658
Biodiversity and Resilience of Coral Reef and Other Ecosystems in Submarine Groundwater Discharge Areas	Proj 3. Response of Coral Communities in Various Submarine Groundwater Discharge (SGD) sites	KRA 3: Rapid, Inclusive and Sustained Economic Growth	SGD is now slowly recognized as an important factor that determines the chemistry of ocean waters. Compared to rivers which has a defined entry to the sea, SGD can potentially discharge into the sea all along the coastal area and into the shelf highlighting the wider influence that SGD may contribute. SGD is also in contact with rocks, soils and sediments which are main sources of dissolved metals, nutrients, and potential urban contaminants can impact the coastal environment as much as or maybe even more than rivers. SGD and its influence on the coral reef ecosystem in Mabini is an area where we might find ways of preserving our reefs given the threats of warming, ocean acidification, and eutrophication. If SGD indeed factors in, then there are more reasons to include this factor in marine surveys, setting-up of marine protected areas, and in environmental protection guidelines for sustainable tourism, which are not included in any of the guidelines worldwide.	1. Spatio-temporal characterization of coral communities (benthos, fish and macroinvetebrates) and coral recruitment in SGD and non-SGD sites 2. Physiological characterization (growth rate, chlorophyll a content, zooxanthellae density, and diversity â€" Symbiodinium clade identification) of common species in SGD and non-SGD sites	UPD	Fisheries managers, Resource planners, local and global scientists	1-Aug-21	31-Jul-24	ONGOING	13,511,330	5,804,105
Biodiversity and Resilience of Coral Reef and Other Ecosystems in Submarine Groundwater Discharge Areas	Proj 4. Probing Microbial Diversity in Submarine Groundwater Discharges (SGD) Areas	KRA 3: Rapid, Inclusive and Sustained Economic Growth	SGD is now slowly recognized as an important factor that determines the chemistry of ocean waters. Compared to rivers which has a defined entry to the sea, SGD can potentially discharge into the sea all along the coastal area and into the shelf highlighting the wider influence that SGD may contribute. SGD is also in contact with rocks, soils and sediments which are main sources of dissolved metals, nutrients, and potential urban contaminants can impact the coastal environment as much as or maybe even more than rivers. SGD and its influence on the coral reef ecosystem in Mabini is an area where we might find ways of preserving our reefs given the threats of warming, ocean acidification, and eutrophication. If SGD indeed factors in, then there are more reasons to include this factor in marine surveys, setting-up of marine protected areas, and in environmental protection guidelines for sustainable tourism, which are not included in any of the guidelines worldwide.	â€¢ Database on the diversity of microbial communities in selected SGD affected sites â€¢ Database on microbial community structures in selected SGD affected sites â€¢ Protocols for culture-independent methods for microbial diversity studies, such as sample preparation, DNA extraction, PCR amplification and DNA fingerprinting	UPD	Academe, Biotechnologists Microbiologists, microbial ecologists and systematists Natural products chemists and researchers Researchers and scientists involved in microbial diversity conservation	1-Aug-21	31-Jul-24	ONGOING	14,884,593	6,229,723
Biodiversity and Resilience of Coral Reef and Other Ecosystems in Submarine Groundwater Discharge Areas	Proj. 1 Distribution, Type and Fluxes of Submarine Groundwater Discharge (SGD) in Mabini, Batangas	KRA 3: Rapid, Inclusive and Sustained Economic Growth	SGD is now slowly recognized as an important factor that determines the chemistry of ocean waters. Compared to rivers which has a defined entry to the sea, SGD can potentially discharge into the sea all along the coastal area and into the shelf highlighting the wider influence that SGD may contribute. SGD is also in contact with rocks, soils and sediments which are main sources of dissolved metals, nutrients, and potential urban contaminants can impact the coastal environment as much as or maybe even more than rivers. SGD and its influence on the coral reef ecosystem in Mabini is an area where we might find ways of preserving our reefs given the threats of warming, ocean acidification, and eutrophication. If SGD indeed factors in, then there are more reasons to include this factor in marine surveys, setting-up of marine protected areas, and in environmental protection guidelines for sustainable tourism, which are not included in any of the guidelines worldwide.	1. Map of SGD occurrences from the coast to a depth of 30 m in Mabini, Batangas 2. Characterization of acoustic signal of differing SGD types 3. Estimates of spatio-temporal variation in fluxes over. 4. Protocols in the use of satellite images and acoustics for rapid assessment of SGD occurrences.	UPD	Fisheries managers, resource planners, local and global scientists	1-Aug-21	31-Jul-24	ONGOING	7,562,840	2,940,280

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
Biodiversity and Resilience of Coral Reef and Other Ecosystems in Submarine Groundwater Discharge Areas	Proj. 2 Marine Benthic Geochemistry and Ecosystems Associated with Submarine Groundwater Discharge (SGD)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	SGD is now slowly recognized as an important factor that determines the chemistry of ocean waters. Compared to rivers which has a defined entry to the sea, SGD can potentially discharge into the sea all along the coastal area and into the shelf highlighting the wider influence that SGD may contribute. SGD is also in contact with rocks, soils and sediments which are main sources of dissolved metals, nutrients, and potential urban contaminants can impact the coastal environment as much as or maybe even more than rivers. SGD and its influence on the coral reef ecosystem in Mabini is an area where we might find ways of preserving our reefs given the threats of warming, ocean acidification, and eutrophication. If SGD indeed factors in, then there are more reasons to include this factor in marine surveys, setting-up of marine protected areas, and in environmental protection guidelines for sustainable tourism, which are not included in any of the guidelines worldwide.	1 Protocols for successful water, sediment, biomass sample collection from various environmental conditions of SGD Areas 2 Isotopic characterization of water from SGD and non-SGD sites 3 Ionic composition of the waters (SGD, ambient seawater) 4 Trace metal composition of the waters (SGD, ambient seawater) 5 Map of seagrass occurrence and type 6 Summary of lipids of dominant seagrasses across physico-chemical conditions 7 Synthesis of molecular markers in the sediments that will provide information on the biosynthetic pathways and diagenetic degradation. 8 Compound-specific C and H of select lipids	UPD	Local communities in Mabini (resort owners, teachers, students, LGUs, tourists) and nearby HEIs (i.e. Batangas State University)	1-Aug-21	31-Jul-24	ONGOING	20,395,005	12,313,027
Discovery of High Value Biomolecules from the Sea Cucumber Stichopus spp.	Project 1. Characterization of High Value Biomolecules from the Sea Cucumber Stichopus spp. (Old Title: Discovery of high value biomolecules from Stichopus spp.)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Two cryptic species of S. cf. horrens have been recently characterized as occurring in the Philippines (Lizano et al. in prep). Such inherent genetic diversity in Stichopus sp. represents added value in terms of the potential chemical diversity of bioactive molecules with potential pharmaceutical or therapeutic value. In addition to being a potential source of novel bioactive molecules, Stichopus spp. are capable of rapid change in the elasticity of their tissues, with some species even capable of drastic responses such as tissue liquefaction or dermal shedding, and are always able to regenerate lost body parts. Understanding the molecular mechanisms by which these remarkable organisms orchestrate their abilities may have significant implications in cellular regeneration, aging, medicine, and biomaterials engineering. We can capitalize on the inherent genetic diversity and unique properties of Stichopus through further characterization of the genetic and associated chemical diversity of the species from different marine biogeographic regions and habitats, coupled with multi-comics studies to characterize molecular mechanisms underlying tissue modulation and regeneration. Characterization of key ecological and reproductive traits will generate information necessary for the development and refinement of culture technologies for hatchery production of the species, and to augment capture-based production. Also, the Philippine sea cucumber industry has the potential to provide valuable raw materials for high-priced cosmeceutical and pharmaceutical products. We can capitalize on the inherent sea cucumber species diversity found in the different biogeographic regions in the Philippines to provide a more abundant source of biomolecules for discovery. The discovery and characterization of sea cucumber compounds and the fundamental understanding of the mutable collagenous tissue phenomenon is a necessary first step and investment in sea cucumber R&D in order to lay the foundations for future product development. Discovery and processing of potential high-value products in parallel with development of aquaculture techniques presents a systematic strategy/path to open up new markets and investment areas. The framework of our integrated research proposal is the use of advanced technologies to characterize biomolecules and understand the determinants of the sea cucumber$\hat{a}\epsilon$™s interesting biological adaptation. A local facility focused on the isolation and chemo-mechanical characterization of marine materials is vital in the development of marine high-value products. The leap necessary to transition from low-value to lucrative high-value products will require a thorough understanding of the physico-chemical properties of these materials. Finding the most appropriate application for each new material discovered will also require structure and property determination. This defines the need to develop a facility capable of performing these types of testing or experiments, which is the focus of the project 4 of the program.	Publication â€ Three (3) publications in Scopus/SCI-E indexed journals Products â€Optimized protocols for LC-MS and MS/MS for metabolites and saponin analysis, tissue sampling and sample preparation for advanced imaging and spectroscopic methods, protocols for saponin extraction and fractionation â€Transcriptome sequences; putative gene identification; secondary metabolite list for S. horrens; SHG instrument People and Services â€Three graduate students supported â€Open laboratory for services for common physicochemical analysis for materials, mass spectrometry â€Three training workshops for MS students Partnerships â€ Potential partnerships with foreign collaborators (materials research groups in US and Taiwan) if active saponins will be discovered through this project	UPD	Public and private hatcheries with capabilities to culture and can be trained, research/scientific community, local fisher partners in pilot grow-out trials, LGU, local resource managers, NAARRDN agencies and DOST-PCAARRD consortia.	1-May-20	30-Apr-23	ONGOING	18,617,310	6,179,199
Establishment of the Center for Mollusc Research and Development	Development of Spawning and Hatchery Techniques for the Blood Cockle (Anadara granosa) for sustainable aquaculture	KRA 3: Rapid, Inclusive and Sustained Economic Growth	In the Philippines, bivalve production is mostly focused on oyster and mussel farming while little has been achieved with regards to breeding and production of blood cockles, Anadara granosa. The proposal will develop a spawning and hatchery technique for the species to ensure sustainable aquaculture production of this commodity that will benefit local fisherfolk in the Philippines as well as realize the full potential of the resource as a high-value export commodity.	Products â€Hatchery protocols and design with potential for pilot testing to target Fisherfolk association (KASAMA Inc) Publication â€At least 2 papers on hatchery techniques and grow-out (ranching type) potential of blood cockles People and Services â€Improve and disseminate the need for hatchery interventions in maintaining wild stocks of mollusks â€At least 1 Training-Workshop on hatchery supported restocking techniques among stakeholders (LGU Aklan, LGU Capiz, Fisherfolk associations) â€Trained personnel (At least 10) â€Graduate students (At least 3 supported) Places and Partnerships â€Partnership with Kalibo Save the Mangroves Inc. (NGO) and Aklan State University on the potential of setting up a cockle hatchery in Aklan â€MOA/MOU with KASAMA and NFMC Patent â€Potential utility model for hatchery protocols of rearing blood cockles (pending results of prior art search) Policy â€S&T based information that will input into policies or guidelines on the implementation of ranching techniques for the blood cockle fishery in selected sites (i.e. use of hatchery reared blood cockle spats to replenish wild stock) Social Impact â€Improved appreciation among stakeholders for the use of aquaculture technologies in ensuring sustainable harvests of bivalve commodities.	UPV	1.Cockle harvesters - Improved income due to increased production 2.LGU - improved livelihood for fisherfolk through sustainable strategies 3.Export partners - improved and constant supply of cockles for export	1-Dec-21	30-Nov-24	ONGOING	9,497,344	5,283,157
Hazard Detection and Mitigation Tools for Algal Blooms in a Changing Marine Environment	Project 1. Development of detection tools for algal blooms to enable rapid responses from organism to environment(Old Title: Enhanced Detection and Mitigation of HABs: from Organism to Environment)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The program will be using molecular, material science, chemical and optical approaches in tandem with instrumentation development in order to come up with viable tools to monitor HAB at a variety of spatial and temporal scales that is needed to come up with consistent long term information of what happens before, during and after harmful algal blooms	Increased cooperation between stakeholders and research institutions to provide more grounded research outputs Products â€ Low-cost water quality sensor package and messaging/app â€ Maps on water quality and HAB organisms â€ Prototype sensor for HAB organism detection using spectral signature â€ Optimized toxin detection capability through SPATT â€ Revised remotely-sensed early-warning system â€ Enhanced dynamic models for HABs for previous and new HAB-affected sites â€ Comprehensive database on HABs; Statistical models on HABs for forecasting â€ Database of planiton in relation to HAB occurrences â€ Decision-support system for HAB management centralizing observations and models â€ Scale-up production method for authentic standards of HAB toxins â€ at least 2 authentic standards of HAB toxins Publication â€ 7 ISI manuscripts for Scopus / ISI-indexed publication â€ Primer on the HAB informatics/decision-support system â€ Manual on low-cost sensors People and Services â€ 13 researchers trained in marine sensor development, HAB cyst dynamics, hydrodynamic surveys, phytoplankton analysis, biological modeling, hydrodynamic modeling, HAB statistical analysis, remote sensing modeling, decision support-system development, consortium-building â€ At least 7 MSc/PhD students â€ 40 trained in the use of water quality sensors developed â€ 5-10 on the job trainees/interns trained â€ Trainings/Workshops on HAB monitoring using low-cost sensors Partnerships â€ Partnerships for water quality/HAB monitoring with academe, government agencies (BFAR/LGUs) and stakeholders (mariculture) â€ Potential partners within DOST regional consortium: Region V (BCAARRD), Region VI (WESVAARRDEC), Region VIII (VICAARR), Region XI (SMAARRDEC) on water quality/HAB monitoring that can be used not just for research but also for interactive teaching modules Policy â€ Input into the guidelines for monitoring and management of harmful algal blooms and mariculture practices	UPD	National agency, LGUs, Coastal communities, coastal managers, researchers	1-Apr-18	31-Jan-22	ONGOING	8,676,484	833,790
Hazard Detection and Mitigation Tools for Algal Blooms in a Changing Marine Environment	Project 2. Fine Scale Characterization of Plankton Community Composition Dynamics for Enhanced Modelling of Harmful Algal Blooms	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The program will be using molecular, material science, chemical and optical approaches in tandem with instrumentation development in order to come up with viable tools to monitor HAB at a variety of spatial and temporal scales that is needed to come up with consistent long term information of what happens before, during and after harmful algal blooms	Products â€ Low-cost water quality sensor package and messaging/app â€ Maps on water quality, HAB organisms and cysts, and physical conditions at HAB-affected sites â€ Optimized toxin detection capability through SPATT â€ Revised remotely-sensed early-warning system â€ Enhanced dynamic models for HABs for previous and new HAB-affected sites â€ Comprehensive database on HABs; Statistical models on HABs â€ Decision-support system for HAB management centralizing observations and models â€ Scale-up production method for authentic standards of HAB toxins at least 2 authentic standards of HAB toxins â€ 1-3 authentic standards of HAB toxins Publication â€ 8 ISI manuscripts for Scopus / ISI-indexed publication â€ Primer on the HAB informatics/decision-support system â€ Manual on low-cost sensors People and Services â€ 3 researchers trained in marine sensor development and SPATT deployment â€ 8 researchers trained ib HAB cyst dynamics, hydrodynamic surveys, phytoplankton analysis, biological modeling, hydrodynamic modeling, HAB statistical analysis, remote sensing modeling, decision support-system development, consortium-building â€ At least 7 MSc/PhD students â€ 40 trained in the use of water quality sensors developed	UPD	National agency, Local Government Units, Coastal communities, coastal managers, research	1-Apr-18	31-Jan-22	ONGOING	13,905,189	485,775

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Hazard Detection and Mitigation Tools for Algal Blooms in a Changing Marine Environment	Project 3. Dynamics of Protein and Small Molecule Chemistry in HAB Causative Organisms	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The program will be using molecular, material science, chemical and optical approaches in tandem with instrumentation development in order to come up with viable tools to monitor HAB at a variety of spatial and temporal scales that is needed to come up with consistent long term information of what happens before, during and after harmful algal blooms	Products â€¢ Low-cost water quality sensor package and messaging/app â€¢ Maps on water quality, HAB organisms and cysts, and physical conditions at HAB-affected sites â€¢ Optimized toxin detection capability through SPATT â€¢ Revised remotely-sensed early-warning system â€¢ Enhanced dynamic models for HABs for previous and new HAB-affected sites â€¢ Comprehensive database on HABs; Statistical models on HABs â€¢ Decision-support system for HAB management centralizing observations and models â€¢ Scale-up production method for authentic standards of HAB toxins at least 2 authentic standards of HAB toxins â€¢ 1-3 authentic standards of HAB toxins Publication â€¢ 8 ISI manuscripts for Scopus / ISI-indexed publication â€¢ Primer on the HAB informatics/decision-support system â€¢ Manual on low-cost sensors People and Services â€¢ 3 researchers trained in marine sensor development and SPATT deployment â€¢ 8 researchers trained in HAB cyst dynamics, hydrodynamic surveys, phytoplankton analysis, biological modeling, hydrodynamic modeling, HAB statistical analysis, remote sensing modeling, decision support-system development, consortium-building â€¢ At least 7 MSc/PhD students â€¢ 40 trained in the use of water quality sensors developed	UPD	LGUs, BFAR, general public, Network partners (Consortia) SUCs, mariculture industry	1-Apr-18	31-Jan-22	ONGOING	12,696,856	1,259,637
Hazard Detection and Mitigation Tools for Algal Blooms in a Changing Marine Environment	Project 4. Integrated harmful algal bloom detection and information system for adaptive responses	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This program builds on previous efforts and aims to help address these issues through 1) the development of a suite of tools that can provide ample spatial and temporal coverage of algal blooms using two approaches: low-cost crowd-sourcing tools and high resolution sensors; 2) providing expanded and more robust models of HABs for previous and new target sites that would enable increased understanding of bloom triggers; 3) providing an information system for the storage, retrieval, and analysis of bloom monitoring data; and 4) integrating with relevant monitoring and management agencies (e.g., BFAR/LGUs) for using the suite of tools for forecasts and mitigation.	-Fine-scale characterization and maps of bloom conditions and transport at the target sites -Fine-scale characterization and maps of phytoplankton/HAB organisms, cyst beds, rates of encystment and excystment in relation to bloom initiation and decline	UPD	National agency, Local Government Units, SUCs, Coastal communities, coastal managers, researchers	1-Apr-18	31-Jan-22	ONGOING	24,702,489	3,039,979
Reproductive Biology Studies, Dietary Analysis, and Life-History of Philippine Tuna Species towards Sustainable Fishing Industry in Mindanao	Project 1. Reproductive Biology Studies of 3 Neritic Tuna Species in Mindanao	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project will evaluate neritic tuna species with its reproductive biology to establish a proper data that will be used primarily in fish management efforts and will further provide more inputs to stock population density implications in the future. Inter and intra-species reproductive variations will, therefore, be generated that will be instrumental in crafting policies that will ensure a sustainable tuna fishing in Mindanao and the country. If the following objectives are realized, the results of this research will be able to provide an updated information on the reproductive biology of neritic tuna species. It would provide relevant knowledge to help understand the reproductive condition of male and female individuals of each species. Having a better picture of the species â€™ reproductive biology on a tissue level would help understand its population dynamics as much as reproduction is concerned. Wholly, this undertaking will be able to provide essential and required biological knowledge that would facilitate stock assessments and efficient management of tuna and tuna-like species in the future, in consideration of sustainability of the tuna resources. Among these policies that might be supported by the data that will be generated from this project are: 1) control of fishing seasons, 2) control of the fishery areas (spawning areas), and 3) control of juvenile fish through the regulation of minimum net mesh size and the prohibition of the sale of juvenile fishes. Thus, this project is important for the assessment of the reproductive potential of the populations as well as to well understand the productivity of fish populations and their resilience to fisheries and environmental changes.	Publications â€¢At least 3 publications on the reproductive biology of Eastern Little Tuna (Euthynnus affinis), Tuna (Auxis thazard) and Bullet Tuna (Auxis rochei) in the seas of Mindanao, Philippines Products â€¢Atlas of the neritic tuna species with updated information on its reproductive biology based on the results of this project People Services â€¢Awareness campaign for local Fisherfolk, canning industries or tuna consumers on the target preys and food preferences of these 6 commercially important tuna species â€¢Two research assistants and two MS Bio students will be trained in reproductive characterization of neritic tuna species Places and Partnerships â€¢MOU with Bureau of Fisheries & Aquatic Resources, private tuna industries, and local government units Patents/Intellectual Properties â€¢Copyright for an atlas of the neritic tuna species with an updated information on its reproductive biology based on the results of this project Policy â€¢Science based information that will input to policy on the 1) control of fishing seasons, 2) control of the fishery areas (spawning areas), and 3) control of juvenile fish through the regulation of minimum net mesh size and the prohibition of the sale of juvenile fishes. Social Impact â€¢Increased awareness of fisherfolk and local community on the present status of the tuna resources in Region 12 as well	MSU-GSC	Stakeholders (Tuna Industry). This project can provide the stakeholders recommendations in tuna fishery management, especially for the small-scale fishers that could potentially result to an increased and efficient catch. The results may be used to provide guidance to the fishing industries to improve their management practices in order to save valuable time and resources. Government Sectors (LGUs and DA). Results from this project can serve as a basis for the development of species atlas that the LGUs and the DA can extend to their clienteles. Furthermore, the results can serve as benchmark information in crafting new technologies in management especially for research purposes, and in developing policies and regulations related to the management and sustainability of the tuna industry and the marine ecosystem in the country. This will also pave the way for LGUs, DA and SUCs to craft complementary technologies for research, development, and extension purposes. Academe and Scientific Community. The results of this project will be shared to the scientific community through various platforms such as local, national, and/or international conferences/ symposia and journal publication as a form of contribution to the body of knowledge. Moreover, this project can be a good avenue for interested graduate and undergraduate students to strengthen their capacities in the field.	1-Jan-20	31-Dec-22	ONGOING	6,478,990	2,505,972
Reproductive Biology Studies, Dietary Analysis, and Life-History of Philippine Tuna Species towards Sustainable Fishing Industry in Mindanao	Project 2. Dietary Analysis and Feeding Habits of 6 Philippine Tuna Species Using Metagenomics	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Application of NGS in metagenomics is currently explored in a plethora of fields such as microbial ecology, molecular taxonomy, and more recently in dietary composition analysis of organisms with high ecological value. In the Philippines, this will be the first time to investigate the dietary composition and feeding habits of tuna or any fish in general caught in its natural environment. Results of this research will provide crucial information on the identification of their target preys directly influencing their spatial distribution and population dynamics, which is important for tuna resource management. An accurate and confident model of the factors affecting species distribution and population structure is essential to managing species viability and sustainability. Thus, this research undertaking aims to ensure the conservation and sustainability of tuna as a major and valuable economic product of the region.	Publications (2) â€¢At least 2 papers on the Dietary Analysis of Intestinal Contents of Oceanic Tunas Thunnus albacares (yellowfin), Katsuwonus pelamis (skipjack), and Thunnus obesus (bigeye) via Metabarcoding, and Metagenomic Analysis of Intestinal Contents of Euthynnus affinis (eastern little tuna), Auxis thazard (frigate tuna), and Auxis rochei (bullet tuna) for Dietary Composition Patents/Intellectual Property â€¢Original scientific data on the diet composition of neritic and oceanic tunas catched from the wild using metabarcoding. More specifically on: 1.DNA profiles and taxonomic identification of plants and animals eaten by each of the 6 tuna species 2.Dietary breadth and food overlap between the 6 tuna species 3.Dietary preferences and feeding habits of each tuna species at varying life stages 4.Species diversity and richness in the dietary composition of the 6 tuna species Products â€¢Handbook on Target Preys of 6 Philippine Tuna Species People Services â€¢Awareness campaign for local fisherfolk, canning industries or tuna consumers on the target preys and food preferences of these 6 commercially important tuna species â€¢Two research assistants and two MS students will be trained for DNA extraction, NGS analysis, metabarcoding, and bioinformatics. Places & Partnerships â€¢MOU with Bureau of Fisheries & Aquatic Resources and private tuna industries Policy â€¢Science based information that will input to policy on the protection, preservation, and identification of specific marine areas found within the migration routes of these tunas within Philippine waters where their target preys abound.	MSU-GSC	Results of this research will provide crucial information on the identification of tunaâ€™s target preys directly influencing their spatial distribution and population dynamics, which is important for tuna resource management. An accurate and confident model of the factors affecting species distribution and population structure is essential to managing species viability and sustainability. Thus, this research undertaking aims to ensure the conservation and sustainability of tuna as a major and valuable economic product of the region. Therefore, the findings of this research will significantly contribute to the scientific community, academe, local fisher folks, tuna industry, local and national economy, marine ecosystem, and the Philippines as a whole.	1-Jan-20	31-Dec-22	ONGOING	21,188,459	6,798,243
Reproductive Biology Studies, Dietary Analysis, and Life-History of Philippine Tuna Species towards Sustainable Fishing Industry in Mindanao	Project 3. Otolith Elemental Fingerprinting, Shape Analysis, and Microstructural Analysis of the 3 Philippine Neritic Tuna Species	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The analysis of otoliths for elemental fingerprinting, shape analysis, and microstructural description will pave the baseline data for the establishment of its age at varying life stages in correlation to its total fish length, growth patterns, life history traits, migratory patterns, and species discrimination between the 6 tuna species that abound within Mindanao waters. Data generated from this research will significantly contribute to an accurate and confident model of the factors affecting species distribution, migration patterns, and population structure of tuna in the Philippines which are crucial for managing species viability and sustainability. Thus, this research undertaking aims to ensure the conservation and sustainability of tuna as a major and valuable economic product of the region.	Publications â€¢At least 3 papers on Otolith Shape & Macrostructural Analysis of 3 Philippine Tuna Species; Otolith Microstructural Analysis for Age Determination, Growth, and Life History Patterns of 3 Tuna Species; and Natal Origin and Migratory Patterns of Tuna Species using Otolith Elemental Fingerprinting Patents/Intellectual Property â€¢Original scientific data on the otolith macrostructural, microstructural, and chemical characterization of the 3 Philippine neritic tuna species will be generated. More specifically, 1.Otolith shapes of the 3 tuna species 2.Establishment of landmarks for the changes in otolith shape for discrimination between species 3.Age range approximation correlating fish length with otolithâ€™s structural attributes 4.Otolith elemental fingerprints of the 6 tuna species at varying life stages 5.Elemental signatures between otoliths collected at varying sites Products â€¢Handbook on Otolith Morphometrics and Life History Patterns of 3 Philippine Neritic Tuna Species Euthynnus affinis, Auxis thazard, and Auxis rochei People & Services â€¢Awareness campaign for local fisherfolk, canning industries or tuna consumers on the approximate age of these 3 neritic tuna species relative to its size and weight, migration patterns, and breeding areas for protection â€¢Three research assistants and two MS students will be trained specifically for otolith processing for macro and microstructural analysis as well as elemental fingerprinting using ICP-MS. Places & Partnerships â€¢MOU with Bureau of Fisheries & Aquatic Resources and private tuna industries Policy Science based information that will input to policy on the protection, preservation, and identification of specific marine	MSU-GSC	Results of this research will provide crucial, scientifically sound information on the size-age approximation, migratory patterns, and life history patterns of the 6 tuna species within the waters of Mindanao which is essential for tuna resource management. An accurate and confident model of the factors affecting species distribution and population structure is important for managing species viability and sustainability. Thus, this research undertaking aims to ensure the conservation and sustainability of tuna as a major and valuable economic product of the region. Therefore, the findings of this research will significantly contribute to the scientific community, academe, local fisher folks, tuna industry, local and national economy, marine ecosystem, and the Philippines as a whole as the data generated will be essential used for the crafting of policies for the management and sustainability of the tuna industry in the country.	1-Jan-20	31-Dec-22	ONGOING	14,097,959	5,191,433

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
Reproductive Biology Studies, Dietary Analysis, and Life-History of Philippine Tuna Species towards Sustainable Fishing Industry in Mindanao	Project 4. Ichthyoplankton Resource Identification towards Replenishment of Tuna Species in Sarangani Bay Protected Seascape (SBPS) and Adjacent Waters	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Studies on fish larvae and ichthyoplankton data in SBPS and their adjacent waters were scarce and insufficient thus the conduct of this study. Results of this study will provide (1) a list/profile of identified fish larvae (ichthyoplankton) of tuna in Sarangani Bay and adjacent waters; (2) relevant inputs and scientific basis for fisheries managers and decision makers in formulating policies on the appropriate seasonal harvest of these species so as to improve the health and population of the tuna and tuna-like fish stocks in the area; (3) better management options that will improve the sustainability of the tuna stocks of the fishing grounds by providing fishes the opportunity to spawn and grow to maturity before they are harvested and; (4) evidence of spawning ground of tuna and tuna-like species in the area and; (5) Increase tuna production thus contribute significantly to the economy of locality and the country in general.	Publications â€¢At least three (4) papers submitted for publication to reputed journals: -profile and inventory of ichthyoplankton resources in SBPS; -physico-chemical analysis of SBPS; -species diversity and richness of ichthyoplankton in SBPS; -seasonal variation in the abundance of ichthyoplankton species in SBPS. Patents/Intellectual Properties â€¢Copyright for a guidebook of profile and inventory of ichthyoplankton resources in SBPS Products â€¢Guidebook of profile and inventory of ichthyoplankton resources in SBPS People Services â€¢Awareness campaign for local Fisherfolk and the rest of the community on the ichthyoplankton diversity of Saranggani Bay â€¢Two research assistants and two MS students will be trained on the sampling techniques and ichthyoplankton biodiversity Places and Partnerships â€¢MOU with Bureau of Fisheries & Aquatic Resources Region XII Policy â€¢Science based information that will input to policies for the protection, preservation, water quality to in Sarangani bay to conserve plankton resources that act as food to tuna resources. Social Impact â€¢Increased awareness of fisherfolk and local community on the present status of the tuna resources in Region 12 as well	MSU-GSC	Scientific community, academe, local fisher folks, tuna industry, local and national economy, marine ecosystem, and the Philippines as a whole.	1-Jan-20	31-Dec-21	ONGOING	6,119,112	2,241,331
	Aquaculture Development of Ulva for Sustainable Production and Product Formulation	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Establish stable production of Ulva biomass in outdoor tank for feed, food and biomedical applications • Collect wild Ulva thalli and examine spores to be used as seedstock for culture production. • Culture and maintenance of seedstock • Growth rate examination of Ulva in outdoor tanks • Preparation of dried Ulva flakes from selected strains • Nutrient/proximate composition analyses of wild and cultured; wet and dried Ulva • Screening/extraction of Ulvan from selected strain • Purification/characterization of Ulvan	1.Publications. At least 2 publications in refereed Scopus or ISI-indexed journal; 2.Patents/IP. One (1) patent application on the culture technology of Ulva for the entire Philippines; and copyrighted manual for the outdoor culture of Ulva; 3.Products. Ulva seed strain and biomass products (wet or preserved-dried) as base ingredient for agriculture and food industry; including the isolated and purified Ulvan polysaccharide products which will be used in pharmaceutical and nutraceutical companies/industries; 4.People and Services. At least 2 graduate scholars to be trained; 5.Places and Partnerships. Technology transfer collaboration with seaweed industry, pharmaceutical company and government agencies (BFAR-R7 and DA-R7) 6.Policy. Policy brief on a sustainable aquaculture of Ulva and the promotion of the its uses to agriculture and pharmaceutical industries.	USC	The target beneficiaries of this project are the following: a. Seaweed company/industry â€" seaweed farmers and companies may obtain Ulva seed stock material as potential strain for biomass culture; including trainings to individuals interested in Ulva cultivation for agricultural purposes. b. Research institutions and pharmaceutical industry â€" results of the study will provide various applications in various fields in the product formulation as feed/food and biomedical applications. c. Academic institutions â€" students, researchers and professors will acquire knowledge in understanding the culture processes and production of Ulva as commercial species desirable in value chain programs. d. Government agencies â€" adoption and registry of Ulva seedstocks as culture strains for biomass cultivation and product formulation, such as BFAR-R7 and DA-R7.	1-May-21	30-Apr-23	ONGOING	8,901,556	6,016,778
	Assessment and Mobilization of Research Initiatives on Philippine Marine Mammals (PHLMarMams)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	To date, there are 31 species of marine mammals (30 cetaceans and the dugong) in the Philippines (Aragones, unpublished data). Globally, there are 83 cetaceans and 4 sirenians. Studies on Philippine marine mammals have been wanting. The more recent limited studies have been mainly conducted by the Marine Mammal Research & Conservation Laboratory of the Institute of Environmental Science & Meteorology of the University of the Philippines - Diliman in collaboration with the Philippine Marine Mammal Stranding Network (PMMSN), BFAR and C3 PH. (for the dugong part). Most of these have had limited funding and were expectedly limited in scale (coverage & duration; except the strandings data, which is national and 15 years running). The other related literature is already old (1990s and early 2000s). Unfortunately, these animals are already vulnerable due to their demanding biology: long-lived, large size, mostly single live birth, extensive pre-reproductive period, resulting in low reproductive potential. In addition to these biological vulnerabilities, these animals are mostly threatened by overexploitation, by catch, pollution, changing climate, and habitat degradation and loss. Under the IUCN Red List, most marine mammals are either threatened, vulnerable, endangered and critically endangered. Proper management of these species, require information or data on their abundance and distribution (i.e., ecology) and population genetics.Â Also, the quantification and documentation of their threats is imperative to address these problems systematically. It is about time that the Philippines comprehensively study these megafaunas in the light of our changing environment and continuing biodiversity loss.Â	End of the Project OutputsProductsAssessment Profile TaÃ±on Strait and Calauit Island.Enhance Repository for the samples collected from stranded marine mammals Publication.At least one (1) peer-reviewed publicationsÂ People and ServicesOne (1) mentored MS studentConduct one (1) necropsy trainingTwenty (20) trained personnel to necropsy and pertinent samples collected.Â Places and PartnershipsPartnership with LGUs in southern TaÃ±on Strait, Negros and Cebu in Visayas and in Calauit Island in Palawan,Partnership with BFAR, DENR and C3-PH PolicyResults of the study can be used as input to policy conservation of Philippine Marine Mammals in TaÃ±on Strait (Negros and Cebu in Visayas) and in Calauit Island in Palawan.	UPD	Select Local Government Units (LGUs) (Regions 4B & 7) Locals communities and Indigenous People (IPs) Bureau of Fisheries and Aquatic Resources (BFAR)Department of Environment and Natural Resources (DENR) (Regions 4B, 7)	1-Oct-21	30-Sep-23	ONGOING	5,000,000	3,415,416
	Biological and Ecological Studies on Asparagopsis taxiformis (BEAT) for Culture Technology Development	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The Philippines has among the most diverse seaweed flora (~ 1000 spp.) in the western tropical Pacific yet we are only utilizing about 20 seaweed species. Of these, the Philippine seaweed industry is heavily reliant on three carrageenan-producing species (i.e., Eucheuma denticulatum, Kappaphycus alvarezii, and Kappaphycus striatus). To lessen our dependence on these species, we need to maximize our seaweed resources by tapping and developing those that hold great socio-economic potentials. Among these underdeveloped and underutilized seaweed resources is the red seaweed Asparagopsis taxiformis. The species can be sold and consumed as food, possess high-value natural products such as phycobiliproteins, and produce bioactive compounds that can be used in the medical, pharmaceutical, and nutraceutical industries (Trono 1997, 2001). Extracts of A. taxiformis was also reported to have anti-microbial properties against pathogenic bacteria in cultured fish and shrimps (Genovese et al. 2012). As feed additives, the bioactive compound bromoform they produce was known to reduce the amount of methane released by cows when they belch (Machado et al. 2014, 2015, Kinley et al. 2020). Recent findings also suggest that as low as 0.20% Asparagopsis addition to feeds, decrease in methane release from cows can go as high as 98%; that, while promoting weight gain among those fed with it (Kinley et al. 2020). Consequently, this alleviates the contribution of livestock to greenhouse gas emissions. However, the culture technology for the large-scale biomass production of A. taxiformis is yet to be developed and this is largely due to our lack of knowledge and poor understanding of the basic aspects of its biology, physiology, and ecology. Thus, we propose to conduct this research for development work to: 1) fill our foundational knowledge gaps on the biology, physiology, and ecology of A. taxiformis; and, 2) facilitate the cultivation technology development for A. taxiformis to sustainably produce biomass for the abovementioned purposes.	Products â—¦Technology package for sporulation and short- to the medium-term culture maintenance of Asparagopsis taxiformis spores â—¦DNA barcodes of Asparagopsis â—¦Catalogued of Herbarium specimens â—¦Data on the biology, ecology, and physiology of Asparagopsis taxiformis Publication â—¦Two (2) publications on ISI, SCI-indexed or peer-reviewed journal People and Services â—¦Six (6) trained researchers, four (4) project staff and two (2) graduate students mentored on seaweed biodiversity, ecology, physiology, and in vitro culture Places and Partnerships â—¦MOA with BatStateU â—¦MOA with Local Government Units and BFAR Policy â—¦Information as input to policy recommendation on the conservation and protection of Asparagopsis taxiformis resources. Currently, A. taxiformis is being targeted by both local and international seaweed researchers and industries due to the high economic potential of the species.	UPD, BatSU	â—¦Seaweed Farmers â—¦Seaweed Industry â—¦Coastal populations â—¦DA-BFAR â—¦Academe, Researchers, Students	1-May-21	30-Apr-23	ONGOING	9,983,854	6,030,927
	Capacity Building on Reef Assessment and Coral Taxonomy Phase 2 (C-BRACT 2)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project will initiate citizen science monitoring of coral reefs through a training and capacity building effort. It builds on the foundations developed by CBRACT-1 and will provide trainers-training to the â€œgraduatesâ€ of CBRACT-1 on reef monitoring using recently developed citizen-science methods. Modules and a protocol handbook will be developed to enable the training to be delivered remotely. Further, it will build the nationwide database and clearinghouse to serve as a repository and back-up for images and data produced by such an effort.	Publication â€¢ Training modules and digital versions of training materials â€¢ 1 Protocol handbook Product â€¢ 1 Remote Learning Course on reef assessment with citizen science methods â€¢ 2 Protocols â€¢ 2 Databases People and Services â€¢ 24 trainers from HEIs and stakeholder LGUs capacitated/trained â€¢ 6 members from the fishermen's association of Lian, Batangas â€¢ Two training of trainers conducted Places and Partnerships â€¢ At least 1 partnership	DLSU	â€¢Faculty and staff of regional institutions of higher education â€¢Coastal community partners of regional institutions of higher education â€¢Bureau of Fisheries and Aquatic Resources â€¢Department of Environment and Natural Resources â€¢Faculty and students of high schools, senior high schools, and colleges	1-Jun-21	31-May-23	ONGOING	4,999,326	2,794,661

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
	Culture Conditions and Environmental Effects on Metabolite Production, Dermal Morphing and Regeneration in Stichopus cf. horrens	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Experimental scale culture will be conducted to produce juveniles and adults with known rearing history and ages. The cultured animals will be used in systematic manipulative experiments in the laboratory and field to determine the factors affecting secondary metabolite production and dermal sloughing and regeneration. Growth, survival and behavioral responses under different rearing conditions. Comparison between juveniles and adults will also provide valuable insights on the effects of ontogenetic development. The secondary metabolites and the physico and chemo mechanical properties of the body wall of replicate animals subjected to the different experimental treatments (i.e. light, density, simulated predatory threats, age) will be analyzed as part of the PCAARRD DOST project on high-value biomolecules to be implemented by the UPS Institute of Chemistry. Pilot demo site for ocean nursery and grow-out culture will also be established with community partners in Bolinao in conjunction with the field experiments.	Products â€¢Pilot demo culture system for S. horrens in Bolinao, Pangasinan Publication â€¢At least 1 paper submitted for publication; â€¢Paper/ poster presentations in regional/local conference People and Services â€¢In this 2-year project, researchers and graduate students will be mentored and trained on hatchery production and ocean rearing of Stichopus horrens. â€¢At least 2 graduate students and 2 research assistants/aides will be trained Partnerships â€¢Interdisciplinary research collaboration with UPD Institute of Chemistry will be undertaken Policy â€¢S&T based information that will input into policies or guidelines for LGUs and DA-BFAR with focus on S. horrens Social Impact â€¢Improved interdisciplinary collaboration among biologists and chemists; exchange of information with local policy makers/resource managers, fishers and other stakeholders and other interest groups Economic Impact â€¢Progress towards development of culture and biomolecules that will provide potential additional economic streams aside from premium grade trepang	UPD	â€¢The research/scientific community, as results generated from the abovementioned studies and observations will open doors for further researchable areas on sea cucumber ecology (organismal, molecular, and biochemical) and fishery stock management (e.g., culture-based restocking and stock enhancement) â€¢Local fisher partners in pilot demo site â€¢LGU and local resource managers will have science-based information to improve sea cucumber fisheries management	1-Mar-20	28-Feb-22	ONGOING	4,959,980	2,389,484
	Examination of Possible Eutrophication of the Reefs in Tubbataha (EoPERT) Project	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project will initiate citizen science monitoring of coral reefs through a training and capacity building effort. It builds on the foundations developed by CBRACT-1 and will provide trainers-training to the â€œgraduatesâ€ of CBRACT-1 on reef monitoring using recently developed citizen-science methods. Modules and a protocol handbook will be developed to enable the training to be delivered remotely. Further, it will build the nationwide database and clearinghouse to serve as a repository and back-up for images and data produced by such an effort.	1. People and Services â€¢ Trained personnel 24 trainers from HEIs and stakeholder LGUs capacitated/trained on conducting independent reef assessments using citizen science methods 6 members from the fishermenâ€™s association of Lian, Batangas â€¢ Training conducted 2 training of trainers from higher education institutions and partner community stakeholders on citizen science methods 2. Places and Partnerships â€¢ Partnership with at least one (1) local government unit or community 3. Publications â€¢ Training modules and digital versions of training materials â€¢ 1 protocol handbook on citizen science on coral reefs 4. Products â€¢ Learning course 1 remote learning course on reef assessment with citizen science methods 2 Protocols Refined protocols on reef assessment with citizen science methods to be published in the protocol handbook Protocol on data sharing (for handling the submission, storage, and access of survey data from reef assessments using citizen science methods) 2 Databases 1 centralized database of survey data from reef assessments using citizen science methods 1 image database of (C3D) benthic survey images	DLSU	â€¢Faculty and staff of regional institutions of higher education â€¢Coastal community partners of regional institutions of higher education â€¢Bureau of Fisheries and Aquatic Resources â€¢Department of Environment and Natural Resources â€¢Faculty and students of high schools, senior high schools, and colleges	1-Jun-21	31-May-23	ONGOING	4,982,859	2,620,967
	Fisheries Catch Assessment Using GPS Trackers and Effort Survey of Municipal and Commercial Fishers in Mindanao (Fisheries Catch Assessment using IoT (Internet of Things) based GPS Trackers and Effort Survey of Municipal Hook and Line and Ringnet Fishers and Purse Seine Fishers in Mindanao)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project will focus on utilizing internet-based gps trackers that will be used to track the movement and distance fished by municipal and commercial fishers. The gps tracker will send signals that will utilize both satellite, existing cellular and radio antennas.	1. Five ISI/SCOPUS publications 2. 2 Patentable tracker prototypes 3. 6 presnetations 4. Development of IEC materials 5. Policy guide on fishing effort distribution and mapping	DOSCST	Tuna industry, municipal and commercial fishers of tuna and pelagic resources, LGUs, academe, fishing companies	1-Aug-19	31-Jan-22	ONGOING	8,617,167	905,140
	Macronutrient, Carbon Cycling, and Aerosol Deposition: Impacts on Phytoplankton Community Structure and Toxin Production of Harmful Algal Blooms (Trace-HABs)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The proposed project will look into the interactive effects of various growth factors (e.g., light intensity, temperature, macro- and micronutrient availability) on the occurrence and toxicity of Alexandrium and Pyrodinium blooms in two major sites in the Philippines: Bolinao in Pangasinan and Cancabato Bay in Tacloban City. These areas are identified as study areas because harmful Alexandrium and Pyrodinium blooms have been reported in these sites where coastal communities also rely on fisheries as a major source of food and income. The project results are expected to benefit coastal communities in the study areas as well as the Philippine population, in general.	Product: -Knowledge/knowhow/information regarding interactive effects of trace metals with other growth factors of HABs -Database of macronutrient concentrations -Module/training program for trace metal-defined algal cell culturing conditions People services: -Trained personnel in metallomics and trace metal biogeochemistry (including all 3 research staff that will be hired during the project duration) -On the job trainees/interns (about 5 per year) -Addition to scientific workforce by graduating science majors (estimated 3 graduate students for the duration of the project) Publications: -ISI-indexed publication (estimated 2-4 peer-reviewed articles for the duration of implementation) -Papers in national and international conferences (estimated 1 per year) -IEC materials: posters, proceedings Places and Partnerships: -Established laboratories including ¡Ša laboratory equipped with facilities for trace metal-defined algal cultures ¡Ša core measurement facility for major nutrients -Partnership with Academia Sinica Policy: -Policy briefs on discharge of riverine and anthropogenic wastes especially those that are metal-containing -Science-based information as input into the crafting of policies on the management of HAB	UPD	General Public Coastal Communities Academic/Scientific Community	1-Jun-20	31-May-23	ONGOING	12,508,077	2,348,042
	Product Development of Vacuum Fried Tuna Skin	KRA 3: Rapid, Inclusive and Sustained Economic Growth	As the human population is growing and their consumption behavior changing, the worldwide demand for fishery products is increasing. Fish is considered safer and healthier to be consumed when compared with animals as source of protein. Fish is also one of the main source of protein in the developing countries. Fishing is one of the major industries in the Philippinesâ€™ agriculture, fisheries and forestry sector. It is still one of the top fish producing countries in the world. Over 1.6 million Filipinos depend on the fishing industry for their livelihood. The Philippines is also considered a major tuna producer in the Western and Central Pacific Ocean (WCPO). The fishing industryâ€™s contribution to the countryâ€™s Gross Domestic Products (GDP) in 2015 was 1.5% and 1.7% at current and constant prices, respectively (Philippine Fisheries Profile, 2015). Tuna remain as the top export commodity with a collective volume of 104,984 MT for fresh/chilled/frozen, smoked/dried and canned tuna products valued at US $296 million. Canned tuna constitutes the major bulk of tuna products being exported (Philippine Fisheries Profile, 2015). It is identified as one the priority commodity from the DOST harmonized national research and development agenda for 2017-2022 focusing on processing and new product development of the aquatic priority commodity aside from seaweeds. Most of the municipal and commercial catch of tuna is increasingly directed towards processing canneries which utilized only the meat portion. These kinds of processed products generate a large amount of by-products like head (13%), skin (10%), visceral organs (8%), bones (6%), fins (1%). These are sold to village people for human consumption (main ingredient for soups, while others are prepared as fried products). Tuna skin is also processed further. It is prepared as â€œdried tuna skinâ€ which when fried it becomes crispy tuna skin called tuna chicharon (FAO, 2013). However, this tuna chicharon is oily and has a fishy after taste because it is fried conventionally at normal atmospheric pressure. To address this problem, this project will use vacuum frying technology to process tuna skin with better nutritional and sensory properties. This technology has gained popularity nowadays due to recent research findings establishing the relationship between the conventional fried food consumption and human health problems. According to Banerjee and Sahu (2017), vacuum fried products would be a suitable alternative for conventional fried products. In the future, it would be more preferred over the fried products due to lower oil and acrylamide content. In the market, imported tuna skin product from Singapore costs â‚± 80.00 per 25 grams and the locally produced tuna skin chicharon is â‚± 50.00 / 25 grams. With this vacuum frying technology, the selling price of fried tuna skin is estimated to be cheaper (â‚± 45.00 / 25 grams) than the existing product. It will be sold at an affordable price with optimum nutritional content and delectable taste.	Products â€¢Vacuum fried tuna skin. â€¢Information on the acceptability and nutritive value of the newly developed product from tuna wastes. Publications â€¢At least 1 paper for publication (acceptability of vacuum fried tuna products through consumer test/processing optimization of vacuum fried tuna products). People Services â€¢15 trained panelists on descriptive testing and product sensory evaluation. Places and Partnerships â€¢Partnership with Southern Philippines Agri-Business and Marine and Aquatic School of Technology (SPAMAST) and Philippine Women College. â€¢Partnership with the Department of Science and Technology-Region 11 Patents â€¢1 utility model (Process of producing vacuum fried tuna skin)	DNSC	Tuna industry LOcal Fisherfolk Small, Medium and Micro Enterprises	1-Jan-20	31-Dec-22	ONGOING	5,000,000	747,549

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
	Reproductive Development and Early Life Growth of Sardinella gibbosa in the Visayan Sea	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Sardinella gibbosa, the dominant sardine species in the Visayan Sea, is heavily-fished from late larval (fry) to adult stages. The stock appears to be made up entirely of fish younger than 2-years, making the fishery increasingly vulnerable to collapse in years with poor recruitment. This is a major concern for the region in the light of global changes in climate. While the BFAR-NSAP studies are regularly conducted in the region, these do not cover the fry fisheries, nor do they include determining otolith-based aging and fecundity/egg morphology. The proposed study aims to cover these aspects to complement existing efforts and provide more comprehensive scientific bases for managing the fishery.	Publication: presentations in 2 conferences; technical reports; 4 publications Patents: Critical habitats of early and other life stages of sardines in the Visayan Sea Products: Information on fishery monitoring scheme; map of fishing operations; validation of length-based growth models; age & growth histories of cohorts; maps of fry and spawner distribution; insights to factors determining stock dynamics; reproductive biology of S. gibbosa; age structure of adults by season & area People and Services: Addition to scientific workforce (local field assistants; fisheries profiling participants; BS/MS students; OJTs & SAs Places and Partnerships: Partnerships w/ LGUs, BFAR-NSAP teams & NFRDI Policies: Scientific and technical information for policy-making bodies of the FMA and national levels; strategic inputs to the National Sardine Management Plan	UPV	Local commercial and municipal fisheries sector Fisheries Stakeholders & consumers Regional BFAR & NSAP Academe	1-Mar-20	28-Feb-22	ONGOING	4,999,566	1,573,546
	Ridge to Reefs Modelling and Monitoring for Decision Support System	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project will help elucidate the type and volume of agrochemicals used in the surrounding areas as well as other pollutants that have leached into the bays to possibly cause marine pollution.	Product: â€¢ potential technology on Comprehensive Coastal Ecosystem-based System (CCES) with scientific basis and will be packaged for environmental monitoring â€¢Ecological Map People services: â€¢2 Public symposia Publications: â€¢1 Operatorâ€™s Manual â€¢1 Technical Brochure â€¢2 Published Technical Paper â€¢2 Paper presentations (local and international conferences) â€¢1 Report (written in layman's language for DOST and LGU) Partnerships: â€¢2 Partnership (MOU/MOA) with PO & LGU â€¢1 Research service agreement with University of Tokyo Policy: â€¢Policy recommendation as inputs in the crafting of city or Barangay ordinance	DOSCST	Coastal Communities in Pujada and Mayo Bays, City of Mati; Local Government Unit (City and Barangay levels); Protected Area Management Board of Pujada Bay Landscape and Seascape; Davao Oriental State College of Science and Technology (DOSCST); and Regional Integrated Coastal Resource Management Center (RIC-XI) Region XI	16-Jun-19	15-Jun-22	ONGOING	2,943,844	195,237
	Screening for Radionuclide Contamination from the Fukushima Accident by Iodine-129 Measurement in Corals from the Philippines	KRA 3: Rapid, Inclusive and Sustained Economic Growth	It is timely for the Philippines to conduct research studies to investigate the effect of the Fukushima accident to the country, especially to assess if it poses any threats to its people. The KRG, which presumably brings radioactive material from the Fukushima accident, hits the northeastern part of the Philippines from Cagayan Province and possibly down to the Bicol Region, with the current periodically migrating northwards and southwards with seasonal and decadal variations. One possible way of assessing if the Fukushima accident has already affected these regions is by analyzing Iodine-129, a nuclear fission product, in corals growing in these locations.	End of the Project Outputs Place a. A laboratory for 129I/127I analysis (Place) Publication a. At least 2 local and 2 international conference presentations. b. At least 2 ISI publications detailing: i.Three (3) coral cores from Cagayan, Aurora, and Camarines Norte regions and their age models. ii.129I/127I time series profiles of the three (3) coral cores. iii.Baseline values of 129I before 1950s (nuclear age) and before the Fukushima accident. iv.Radionuclide contamination assessment and comparison in the three (3) coral locations from pre-nuclear age (1950s) to present. v.Description of ocean transport mechanism of radionuclide contamination to the three (3) coral locations. Policy a. Policies or guidelines for radionuclide contamination from the Fukushima accident to northeastern Philippines and for similar future incidents. Year 1 Outputs Place a. Establishment of a laboratory (i.e., both equipment and personnel) capable of processing and measuring I-129 and I-127 in coral samples. Publication (sample and data acquisition): a. Acquire 1st coral sample b. Construct the age model of the 1st coral sample c. Measure 129I/127I in 1st coral sample	PNRI	Regulatory Bodies, LGUs, Research Institutions, Academe, and the General Public	1-Feb-18	31-Jan-22	ONGOING	7,623,639	637,330
	Spatio-temporal Monitoring and Rehabilitation Technology for Coral Reefs (SMaRT-Corals)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project is a combination of ecological monitoring and the development of soft restoration protocol. It aims to elucidate important insights on how the benthic community and its associated fish assemblage respond to major natural disturbances and evaluate the potential of substrate stabilization technology in rehabilitating damaged sections of a high energy reef area. Furthermore, the project will provide important spatio-temporal data and develop technical manpower necessary to effectively manage this important natural resource.	Publications â€¢1 ISI Publication â€¢1 Primer on substrate stabilization and management Products â€¢1 Recovery Potential Model â€¢1 Habitat Map â€¢Quarterly Monitoring Reports â€¢Protocols for substrate stabilization People and Services â€¢5 Personnel trained in substrate stabilization â€¢3 Participants/students/on the job trainees â€¢2 Master of Science graduates Places and Partnerships â€¢DENR IV-B â€¢Improved linkage between Sablayan LGU, DENR IV-B, DOST, and UPLB Policies â€¢Input to proposed policy instruments â€¢Protocol for substrate stabilization	UPLB	LGU, DENR, DOT, academe, researchers and students	1-Feb-20	30-Apr-22	ONGOING	5,000,000	1,778,781
	Transcriptome and Metabolome Profiling of Seaweeds to Elucidate "Ice-ice" Diseases and Epiphyte Infestation Mechanisms	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project proposes the utilization molecular biology and biochemical techniques, namely comparative transcriptomic and non-targeted metabolomics analysis, in order to understand the molecular mechanisms underlying the occurrence of ice-ice disease and epiphyte infestations in commercially important seaweed species (Kappaphycus sp. and Eucheuma sp.). To date, studies on the development of ice-ice disease have been limited to correlating environmental factors that may cause the disease or isolating potential bacterial pathogens that may cause or aggravate the disease. Despite these studies, a clear consensus as to what actually causes the disease has still not been reached. In fact, from our consultations with several seaweed producers, varying descriptions of the manifestation of ice-ice disease have been noted, indicating that there could be more than one single causative factor for this disease. In relation to epiphyte infestations, although improved resistance of fertilized seaweeds has been observed, actual host-parasite interactions and the underlying mechanisms for this phenomenon have received little or no attention at all. Understanding the actual physiological status of disease-affected seaweeds at the molecular level (using RNA and metabolites) will therefore allow us to pinpoint more specific causes and will eventually lead to formulating better strategies in preventing or mitigating the disease through better culture practices.	Publications â€¢1 Publication possibly related gene expression profile changes in response to diseases â€¢1 Publication possibly related to genes that can be associated with disease resistance Policy â€¢1 Policy recommendation on possible biosecurity measures or zoning areas for farms People and Services â€¢Support for at least 2 undergraduate students and 2 MS students â€¢Dissemination of improved knowledge on ice-ice and epiphyte infestation to seaweed farmers (This is in relation to updating current practices in managing ice-ice and epiphyte infestation) â€¢Provide science-based farming strategies based on molecular data to mitigate or manage disease occurrence in seaweed farms Places and Partnerships â€¢6 collaborations (SEAFDEC, PSU, UA, CTU, NIPSC, MSU-Tawi tawi)	UPV	Seaweed Farmers and Researchers in Seaweeed Biotechnology	1-Feb-20	31-Jan-22	ONGOING	12,483,797	5,387,233

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
	Understanding Physiological Vulnerability of Ulva spp.: Implication to Green Tide Blooms (ULVA Project)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	To provide baseline information on aspects of the biology, ecology, and physiology of green tide bloom-forming Ulva species in selected coastal areas in Batangas for coastal resources management. 1. To assess the diversity, distribution, phenology, and standing crop of different Ulva spp. in selected coastal areas in Batangas Province; 2. To characterize the photosynthetic characteristics of the naturally growing Ulva spp., under different physicochemical parameters; and, 3. To examine the growth and development responses of Ulva spores grown different physicochemical parameters.	1.Publication -Two (2) Research papers: local and international publication (peer-reviewed) -IEC Materials (e.g., brochure, flyers, video) 2.Product -Two (2) Database and Herbarium: one in BatStateU VIP CORALS and one in UPMSI -DNA barcodes of Ulva species from Batangas 3.People services -Eight (8) trained personnel: Two (2) trained research assistants -Six (6) trained personnel form LGUs 4.Places and partnerships -MOA with six (6) coastal areas in Batangas & one (1) National University 5.Policy -Scientific inputs to policy 6.Social Impact -Public information and awareness about green tide blooms -Capacitating locals on monitoring possible green tide bloom 7.Economic Impact -Data from the project can be used for scientific valuation aiding MPAs eco-tourism area establishment and EAFM action planning; -Possible development of alternative livelihood	UPD, BatSU	The target beneficiaries of this project are the following: â€¢Research Staff of VIP CORALS and UPD MSI â€¢Government Agencies â€¢Non-Government Organizations â€¢Environmental Practitioners of Hotels in the VIP â€¢Resorts and Hotel Owners â€¢Coastal Resource Managers	1-Apr-21	31-Mar-23	ONGOING	4,264,660	2,465,955
Resource Inventory, Valuation and Policy in Ecosystem Services under Threat (RE-INVEST): The Case of the West Philippine Sea	Project 1. Resource Inventory and Assessment of the West Philippine Sea	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Project 1 of the RE-INVEST Program seeks to quantify the ecosystem assets and services in the WPS and assess the biophysical impacts of damages in the area. Specifically, the project aims to make a comprehensive determination of its biological resources; ascertain the mineral and energy resource potential of the area; measure the spatial extent of damage that has occurred in the last decade due to anthropogenic activities; and elucidate other potential damages due to construction, navigation, and marine pollution.	Publication a. Ten (10) manuscripts for submission to reputable scientific journal/s b. At least one (1) policy brief c. At least two (2) explainer videosd. Press releases and collaterals for promotional activitiesProduct a. Database of location, extent and condition of coastal and marine biodiversity and resources of seven (7) project sitesb. Assessment of marine bioregions protocolc. Communication plan for the RE-INVEST WPS ProgramPeople:Six (6) Masters/PhD students who will be part of the project as GREAT scholars (RS-GIS, modelling, molecular analysis and/or fieldwork techniques for use in coastal and marine scientific research, whichever is relevant to their component.Place: Linkage with project site LGUs Policy: Science-based inputs into policy for coastal and marine environmental resource valuation	UPD	Filipino people (in terms of food and job security), LGUs and NGAs, Filipino researchers	1-Dec-21	30-Nov-24	ONGOING	79,427,230	14,592,674
Resource Inventory, Valuation and Policy in Ecosystem Services under Threat (RE-INVEST): The Case of the West Philippine Sea	Project 2. Natural Capital Accounting of Coastal and Marine Ecosystems in the West Philippine Sea	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Project 2 of the RE-INVEST Program will develop a systematic and comprehensive accounting and valuation of the ecosystem assets and services of the WPS that conform to international guidelines and frameworks. Using natural capital accounting, estimation of the coastal and marine assets and services will be made by putting values to different components, and its contribution to the economy and human well-being will be analyzed.	Publication: At least three complete drafts ready for submission to journalsAt least one (1) policy brief At least two (2) explainer videos Product: Coastal and marine natural capital accounts for WPS Standardised valuation protocol People: Capacity building of stakeholders and project staff Educating the local and NGAs on the value of coastal and marine resources of WPS Two (2) graduate students involved in the project as GREAT scholars Place: Linkages with LGU, academe, NGAs that are mandated to protect/manage coastal resources Policy: Input to possible national law/policy on WPS	UPLB	Fisherfolks within the WPS National policy makers Â¿â€¢ local and NGAs Graduate students, SUCs	1-Dec-21	30-Nov-24	ONGOING	22,416,795	7,791,413
Resource Inventory, Valuation and Policy in Ecosystem Services under Threat (RE-INVEST): The Case of the West Philippine Sea	Project 3. Development of Legal and Policy Framework for the Assessment, Valuation, and Accounting of Philippine Coastal and Marine Resources	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Â Project Component 3 of the RE-INVEST Program will enhance the general legal and policy framework for marine resource valuation, accounting, and assessment in the Philippines, including the means for determination of liabilities and imposition/collection of damages and/or penalties for adverse impacts on the marine environment and resources attributable to man-made causes, both deliberate or accidental. The current framework is too specialized and limited in scope and application, and there is a need to expand and elevate its status and utility, hence the necessity for the RE-INVEST Program. Project Component 3 aims to provide the legal basis for more specific initiatives for assessing damages for the degradation of the marine environment and resources, particularly in the West Philippine Sea (WPS). It will also provide legal guidance/advice as necessary to the other two Project Components in the course of the RE-INVEST Program to ensure that recommendations work within the parameters of relevant Philippine laws and policies.	Publication: Two (2) research papers/publications, the first, reviewing the Philippines' existing legal and policy regime relevant to marine resource valuation, accounting, and assessment; and the second, comparing the Philippine legal and policy regime with international practices and experiences, proposing general legal or policy reforms to improve/enhance the Philippine legal and policy regime. One (1) research paper/publication utilizing the findings of the previous research and applying the proposed guidelines to the situation in the West Philippine Sea, assessing legal liabilities and provable damages for damage to the marine environment and resources therein, relying on the findings of Project Components 1 and 2. Patent: None Product: One (1) proposed guidelines for making, pursuing and proving claims for damages and/or imposing penalties and costs for marine environment/resource indemnity, rehabilitation or restoration before national and international courts or tribunals. People: One (1) public seminar/symposium on the liability and compensation regime for the marine environment and resources. Place: Partnership with the International Oil Pollution Compensation Funds (IOPC) Policy: One (1) draft legislative bill and/or draft interim policy instrument providing guidance for the investigation, documentation, and assessment of damages and costs for the marine environment and resources	UPD	Government officials and agencies involved in environment and natural resources management Civil society stakeholders with interests in environment and natural resources	1-Dec-21	30-Nov-24	ONGOING	5,792,155	2,222,735
	Assessing the Feasibility of Brackish Water Tilapia Production Towards Developing an Effective Business Model	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Increasing production of saline tilapia because of high demand in the market as consumers would prefer this variety of tilapia due to absence of â€˜mud odorâ€™. Similarly, BFAR has also identified several product variants that can be produced out of fresh tilapia such as fish fillet and vacuum packed for whole or cut tilapia. All of which had also been identified to have an export potential. Likewise, BFAR XI has relayed that production of saline tilapia is relatively easier as compared to fresh water tilapia because the former is more resilient to changes in temperature. Recently, Dr. Ferdinand Rex Traifalgar of the University of the Philippines (UP) Visayas has developed the 7th generation of tilapia breed from the Nile Tilapia Egypt Strain (PCAARRD, 2020). This breed could grow at a rate equivalent to the freshwater growth rate under seawater condition of 35ppt. The breed can also thrive after transfer from 15 to 35 ppt. Mortality rate is only 5% and recovery time is 10 hours. With this new breed, this study intends to assess the opportunity for potential expansion of tilapia production in brackish water areas particularly in the Visayas and Mindanao regions where these areas are mostly identified by BFAR.	Publication -One (1) Policy brief on how to enhance acceptability of brackish water tilapia production among aquaculture farmers At least two information bulletin regarding the brackishwater tilapia production for Visayas and Mindanao Product -Business model for brackish water tilapia production validated and tested - Profile of market participants (producers, distributors, wholesalers, retailers, importers, exporters, governmental structure, etc.) -Supply chain maps for brackishwater tilapia in Visayas and Mindanao - Information on desirability, operational efficiency, technology adoption, and viability of brackish water tilapia production People and Services At least thirty (30) capacitated tilapia fisherfolk/farmers and other value chain players/ beneficiaries Four researchers trained in conducting feasibility and business model development Partnerships At least five (5) partnerships/collaborations with SUCs (i.e. UP Visayas), Bureau of Fisheries and Aquatic Resources, Municipal Agricultural Offices in Visayas and Mindanao, and other stakeholders Policy Policy recommendations on how to unlock the business potential of tilapia production ventures in the Philippines	UPMin	The intended beneficiaries of this study include the following: â— Tilapia industry stakeholders in selected areas in the Visayas and Mindanao Regions (e.g. smallholder fisher folks/farmers, traders, processors, consumers) â— Researchers (SUCs/HEIs and other national agencies) â— Policy makers â— LGUs of selected areas in the Visayas and Mindanao Regions â— BFAR â— PCAARRD	15-Sep-21	14-Mar-23	ONGOING	5,000,000	3,500,000

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	Advocating Science-based Policy Reforms for the Sustainable Production and Consumption of Non-Timber Forest Products in the Philippines: The Case of the Almaciga Resin Industry	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This policy advocacy project proposal is an offshoot of the recently completed project on Market Assessment and Financial Feasibility of the Production of Chemical Non-Timber Forest Products funded by the Department of Science and Technology through the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development.Â The project aims to advocate for policy reforms on almaciga resources in the Philippines to increase the benefits gained by indigenous peoples and local communities from the resource and to ensure its sustainable production and consumption.Â Specifically, the project aims to establish the technical/scientific basis for the determination of almaciga resin quota and push for advocacy reforms on almaciga resin.Â	1. Policies a. Draft DENR Administrative Order on permit duration and almaciga resin tapping that will provide a basis for determining almaciga resin collection quota and a more realistic way of conducting inventory of almaciga resources, among others b. Recommendations to enhance the FPRDI guidelines, e.g., tapping frequency and other findings of the resin yield study 2. Products a. Almaciga Research and Development Framework 3. Publications a. At least two (2) articles ready for publication in refereed journals b. Policy Brief c. IEC materials on almaciga resin tapping 4. People services a. Capacitated POs and PO members on resource inventory 1 Economic Impacts a. Increased income of almaciga resin tappers b. Higher contribution of the NTFP sector to the GDP c. Higher government revenues from NTFP utilisation (forest charges) 2. Social Impacts a. Improved welfare of resin tappers b. Appreciation of the true value of almaciga resin c. Conservation of natural almaciga stands for future generations	UPLB	At the end of the project, it is expected to benefit the following sectors:Â â€C IPs and local communities engaged in almaciga resin tapping and collection â€C Local government units â€C Department of Environment and Natural ResourcesÂ â€C Palawan Council for Sustainable DevelopmentÂ â€C Department of Trade and Industry â€C Non-Timber Forest Products - Exchange Programme â€C Almaciga resin industrial users and exportersÂ	1-Oct-21	30-Sep-23	ONGOING	5,000,000	3,374,153
	Annotated Compendium of Gender and Development Research in Agriculture, Aquatic, and Natural Resources (AANR): Towards Developing the AANR Gender and Development and Development Research and Development Agenda and Framework	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The creation of a compendium provides an analytical review of the research findings of gender perspective related researchers. It will begin by determining what are current gender perspective related researches, what are the gender-perspective methodologies done; what specific knowledge areas in gender and development in AANR research in the Philippines will focus on; and will determine the existing research and knowledge gaps that exist in AANR research in the Philippine context. Further, it can provide a critique to the existing publications.	Policies â€CProvision of resources to know future directions of gender-related researches in AANR; Recommendation for capacity building program for researchers necessary for the conduct of potential studies; Policy brief; Development of the AANR GAD R&D Agenda and Framework Product â€CCollection of published and unpublished research outputs People and services â€CPractical training on Qualitative Content Analysis to 3 Science Research Analysts Publication â€CCompendium of Gender and Development Research in Agriculture, Aquatic, and Natural Resource One journal article Partnerships â€CEstablished linkages with state universities and colleges and private universities and colleges	UPMin	State universities and colleges, Private universities and colleges, PCW, LGUs, and National Government Agencies	1-Jul-21	30-Jun-23	ONGOING	5,000,000	2,636,787
	Assessing the Economics and Policy Environment of Custom Hiring of Rice Mechanization Services in the Philippines	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Despite the recognition that agricultural mechanization can lead to an increase in farm productivity, and the fact that farm mechanization is one of the identified policy/program components for agricultural modernization in the country, the level of mechanization in rice and corn farming lags behind comparable countries such as Thailand. Moreover, even with the availability of agricultural machineries in the country, some rice production operations are still predominantly done manually. This only shows that there is a slow progress in terms of agricultural mechanization in the country. The study aims to assess the economics and policy environment of custom hiring agriculture mechanization services in the Philippine rice industry by examining the following areas: policy environment, industry support, extent of and factors affecting adoption of custom hiring services, effects of custom hiring services on productivity, profitability, labor displacement and gender differences. By the end of the project, it aims to recommend policy options on how custom services can be further enhanced to increase the level of agricultural mechanization in the rice industry.	Products ï‚ Policy Framework for CHS ï‚ R&D Framework for CHS Publications: ï‚¨ 3 Draft Journal articles Places and Partnerships: ï‚¨ Strengthened partnerships with Philippine Rice Research Institute (PhilRice), Center for Agri- Fisheries and Biosystems Mechanization (BIOMECH), Philippine Center for Postharvest Development and Mechanization (PhilMech) People and services ï‚¨ Provision of Financial Feasibility Study of CHS farmer adoption and of CHS providers. Policy ï‚¨ Formulation of 2 Policy Briefs on increasing level of agricultural mechanization through custom hiring services	UPLB	The beneficiaries of the project will include Policy- and decisionmakers, farmers, CSF providers (e.g., farmersâ€™ association/cooperatives, privately-owned facilities), researchers and other stakeholders.	1-Sep-21	28-Feb-23	ONGOING	5,000,000	3,576,881
	Assessment and Valuation of the Ecosystem Services of the Pantabangan-Carranglan Watershed Forest Reserve	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The Pantabangan-Carranglan Watershed Forest Reserve (PCWFR) is a critical watershed that contributes significantly to the provision of ecosystem services in the northern part of the Philippines. Recognizing this, the project aims to conduct a holistic assessment and valuation of key ecosystem services to support the development of a sustainable financing mechanism for the PCWFR. Specifically, the project aims to assess the ecosystem extent, conditions, ecosystem services, benefits and beneficiaries of PCWFR, characterize the different stakeholders, estimate the value of key ecosystem services provided by the PCWFR evaluate the potential of PES as a conservation financing scheme for the PCWFR, and provide specific recommendations for the sustainable management of PCWFR. These objectives will be accomplished through watershed characterization, land use and land cover analysis, focus group discussions, key informant interviews, stakeholder and institutional analyses, modeling, and market and non-market valuation techniques.Â Â Among the outputs of the proposed project will be publications in refereed journals, policy brief, ecosystem accounts of PCWFR, IEC materials on PES, description of PES potential of PCWFR, capacitated POs and partners (NVSU, PAMB, DENR) and recommendations for PA management and for the institution of PES and other conservation financing schemes in the Philippines. The projectâ€™s potential impacts include poverty reduction in upland communities (SDG 1), sustainable management of water resources (SDG 6), forest restoration and biodiversity conservation in PCWFR (SDG 15).Â Â	1. Publication a. At least two (2) articles ready for publication in refereed journals b. At least one (1) Policy Brief c. At least one (1) brochure or poster on PES 2. Product a. Ecosystem accounts for PCFWR 3. People and Services a. Capacitated at least ten (10) staff of LGU, DENR/PAMB, NGO, POs and academe on the use of valuation tools and PES b. At least two (2) trained undergraduate (BS) and two (2) graduate (MS/PhD) students c. Involve and train at least one (1) GREAT scholar 4. Places and Partnerships a. Partnership with NVSU (MOU only for staff involvement) b. Partnership with PAMB/DENR and LGU 5. Policies a. Local level (municipal) and national level recommendations for the institution of PES and other sustainable financing mechanisms in the Philippines b. Policy recommendations for PA management	UPLB	Policy and decision makers, academe (students, faculty members, researchers), private organizations, local government units, government agencies (DENR), POs, upland communities (men and women)	16-Dec-21	15-Dec-23	ONGOING	5,000,000	3,041,998
	Assessment of Payment for Water Ecosystem Service (P-WES) Initiatives towards the Development of a Philippine PES Protocol	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The recognition of Payment for Ecosystem Services (PES) started in 2000, but the Philippines still has to craft a policy that requires or stipulates adoption of PES. There are various PES schemes that are documented/reported to be existing in the country, with services including watershed protection, carbon sequestration, water supply, flood mitigation, aesthetic and recreational value, and biodiversity. However, these are short-lived PES-like initiatives. A successful and market-driven PES is yet to be implemented in the country. Embarking on a review of secondary data from published PES initiatives in the country and an on-site data collection using various methods and tools to analyze these data, there is the need to have a closer look at the benefits that accrue to the providers of the environmental services, to understand the necessary steps needed for adoption of PES in the Philippines. This project will complement an on-site research on PES that will be conducted in Barobbob Watershed in Nueva Vizcaya to provide a road map that looks back at the success and failures of previous initiatives. In this light, the project will contribute to the establishment of workable arrangements to form a well-informed National PES Policy.	1. Product a. National Protocol for P-WES Implementation 2. People Services a. Capacity building of stakeholders and project staff. b. Educating the local stakeholders of their roles and benefits from PES implementation. c. One (1) graduate student to pursue GREAT with PCAARRD 3. Places and Partnership a. Linkages with LGU, academe, NGAs that are mandated to promote PES in the country 4. Policy a. Policy brief b. Draft policy on PES 5. Publication a. At least two complete drafts ready for submission to journals 1. Economic Impacts a. Improvement in income levels of communities, businesses, and local governments from conserving Ecosystem Services through PES; b. Improvement of health outcomes through increase in water ecosystem services; and, c. Sustained and robust market for ecosystem services contributing to local economic growth. 2. Social Impacts; a. More cohesive communities because of binding agreements and continued interaction through PES arrangements; b. Higher concern and prioritization of the environment by communities, businesses, and government; and, c. Empowered communities implementing complementary environment conservation programs.	UPLB	Researchers, communities, local governments, and national policy makersÂ	1-Nov-21	31-Oct-23	ONGOING	5,000,000	2,695,949

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	Decision Support System for Effective Lake Governance of the Seven Small Crater Lakes in San Pablo City, Laguna	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This study aims to contribute to the body of knowledge and to development practice by examining the evolution of the governance system and institutional arrangements in relation to the management and conservation of the seven crater lakes in Laguna and developing a decision support system for guidance in local communities. This will involve dissection of changes in human-environment interactions within the communities surrounding the seven crater lakes. In turn, results will guide us the development of a decision support system for planned change within lake communities vis-Â -vis local development planning. While there have been a limited number of studies that explicitly tackle governance systems and human-environment interactions in the context of lakes, a research and development endeavor has yet to be done to develop appropriate policy planning tools informed by a focus on systematic study of human-environment and governance transitions in surrounding communities.Â Â	Publication: Publication - Â Draft scientific journal articles Â IEC and training materials Â Â Patent: n/a Â Â Product: Product - Â Decision support system, Â knowledge sharing platforms (website) Â Â People:	UPLB	Scientific community Municipal Local government units (San Pablo City, Nagcarlan, Rizal) Provincial Government of Laguna Local Fisheries and Aquatic Resources Management Council (FARMC) Other local peopleÃ¢,~â,¬s organizations Laguna Lake Development Authority	1-Dec-21	30-Nov-23	ONGOING	5,000,000	2,613,281
	Developing a Point of Catch to Plate Traceability System for Tuna in Davao Region	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Building from the outputs of the catch documentation project implemented by Davao Oriental State University, this new project will develop a traceability system for tuna to support compliance to the market needs. It will involve the collection and analysis of key ecological and socio-economic data in the tuna value chain enabling traceability from point of catch to export and end-retail. Different models will be built to target specific areas of impact while considering the feasibility of implementation. The models will be aligned with the value chain playersâ€™ diverse needs and strategies. It is perceived that impacts would be different for the small and big players	Publication:â— At least two (2) traceability tool kits for use of (1) value chain players; (2) policy-makers (e.g., BFAR and LGUs) â— At least five (5) articles submitted to journal publications (e.g., ISI/Scopus) â— Presentation to at least five (5) local and international conferences/seminars â— At least one (1) policy brief discussing how the developed traceability system and platform/tool can help improve competitiveness and conformance to local and international regulationsProduct: â— At least one (1) traceability system developed exhibiting the CTE-KDE framework in the tuna value chain â— At least two (2) traceability tools/platform: one (1) mobile app and one (1) desktop application/People:â— Mentoring of at least five (5) undergraduate students (men or women) and internship for two (2) Master of Science students (men or women) â— At least fifty (50) women and men stakeholders (fisherfolk, fishing companies, fish traders, BFAR, local government units) trained on the traceability system and use of digital platform for food safety and sustainable production of tuna â— Piloting/training of 100 fishers and 45 vendors (72 males, 73 females) on the traceability tool/platformPartnerships:At least fifteen (15) partnerships developed including Bureau of Fisheries and Aquatic Resources (BFAR), Davao Oriental State University (DOrSU), six (6) local government units within the region, various municipal and Barangay Fisheries and Aquatic Resources Management Councils (MFARMC & BFARMC), fishing companies and other value chain playersPolicy: Policy (e.g. development of new policy/ordinance) for the institutionalization of tuna traceability in the Davao Gulf	UPMin	Â â— Value chain players in the tuna industry (fishers, traders, processors, fishing companies) â— Consumers/general public â— All local government units in the Davao Region â— Government agencies working on fishery management and regulations (e.g. DA-BFAR) â— Research institutions including state universities and colleges/academeÂ	1-Dec-21	30-Nov-23	ONGOING	5,000,000	2,746,316
	Development and Piloting of Digital Marketing to Facilitate Market Access of Vegetable and Tropical Fruits Value Chain Participants in CALABARZON	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project would assist producers to overcome information asymmetry and to have coordinated exchange (bringing together of buyers and sellers) while minimizing face-to-face interactions. However, much like other types of industries, digital marketing in agriculture need to focus on understanding first the current client base to be able to promote effectively. Digital marketing in the Philippines is challenged by slow internet connectivity, way too low in fact, when compared with that of our neighboring countries. This is crucial since with digital marketing, slow or intermittent connectivity (if any) could translate to slow or no e-business at all. Since agricultural products are highly perishable, this could translate to postharvest losses and for some, non-marketing of their harvested crops. It is also important to understand how people would be able to connect to this new and exciting platforms. Ryan (2017) pointed out that digital marketing is not about technology alone but also about understanding people, how they are using the technology and how they can leverage to engage with others more effectively. These therefore points to the general questions of how ready are the vegetable and fruit farmers for digital marketing and what are their needs for this growing trend in the marketing of goods, including agricultural commodities.	Publication â€¢At least (2) information bulletin and one (1) policy brief Patent â€¢Database (cooperators ready/already into digital marketing and their best practices; list of value chain players, supply and demand, prices) Product â€¢Operational model for the provision of marketing services for vegetable and fruit; market information system covering production and supply data and list of value chain players; market advisories People and Services â€¢At least four (4) farmer organizations/cooperatives linked to AABH and buyers Partnerships â€¢At least six (6) partnership developed such as with PCAARRD Agri-Aqua Business Hub, farmer cooperators/organizations/cooperatives, government agencies and private sector Policy â€¢Policy framework for digital marketing	UPLB	Vegetable and tropical fruit producers in CALABARZON, traders, PCAARRD AABH, policy makers, farmer organizations, cooperatives and agricultural information service providers	1-Jul-21	30-Jun-23	ONGOING	5,000,000	2,560,000
	Development of a Blue Economy-based Science and Technology Innovation (STI) System for the Agriculture, Aquatic and Natural Resources Sectors	KRA 3: Rapid, Inclusive and Sustained Economic Growth	At present, there have been several programs related to coastal and marine resources in the Philippines, however whether these are complementary with the blue economy remains as a question. The management of the coastal and marine resources have been enshrined through and operationalized by the Coastal Resources Management (CRM) program. The program aims to conserve these valuable ecosystems and ensure that its ability to support larger societal goals are realized particularly in terms of food security and poverty reduction. At the outset, there may be low regard for challenges that a blue economy may face like handling system for marine-based products, offseason livelihood options for fisherfolk, rising tourism versus intra-island food security, available natural capital and infrastructure vis-Â -vis appropriate technologies, and high dependency on natural resources. In addition, much of the governmentâ€™s support to agriculture has for years been largely on landbased farming that surely would still need more in the coming years, but comparable support to aquatic-based agriculture must also be met with equal measure to ensure a more diverse agriculture-based economic system. Due to this, conventional land use planning perspectives has not maximized the full potential growth of the national economy particularly the huge growth potential by the coastal and marine resources both at the local and national levels.	Policies â€¢ A set of policy recommendations for the strengthening of science and technology innovation (STI) system to support the blue economy implementation in the country People and services â€¢ Training of three (3) researchers, and at least two (2) graduate students in UPLB Publication â€¢ Compendium of dataset on the quantity and quality of agricultural commodities related to coastal and marine resources in Eastern Samar and Siargao Island; â€¢ At least one (1) journal draft article for publication in ISI journals.	UPLB	â€¢ Communities (farmers and fisherfolk) of Siargao Island and Eastern Samar â€¢ Municipalities and peopleâ€™s organizations of Siargao Island and Eastern Samar â€¢ Department of Science and Technology (Regions 8 and 13) â€¢ Department of Agriculture (DA) â€¢ Philippine Climate Change Commission	1-Sep-20	31-May-22	ONGOING	5,000,000	1,768,281
	Development of an S&T based Gender-responsive and Crisis-resilient Root and Tuber Crops Value Chain through a Participatory Market Chain Approach	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project hopes to bring the opportunities in root and tuber (R/T) crops production and utilization into a pilot of the Participatory Market Chain Approach (PMCA) to facilitate a gender- and crisis-responsive R/Tmarket chains. This project will seek to facilitate the development of shorter and more inclusive S&T-based R/T crops value chain(s) where actors conduct business as partners and collaborators. With a greater sensitivity to gender dimensions of R/T value chains built in, inclusiveness is promoted on two fronts: by facilitating smallholder participation and by conducting gender analyses at key points to inform the innovation process	Publication â€¢Two (2) articles â€¢One (1) Facilitatorsâ€™ basic guide for public institution-led gender-responsive value chains innovation (electronic format) Products â€¢At least one (1) new R/T value chain developed and launched per site â€¢Process documentation People and Services â€¢At least three (3) personnel in total from cooperating LGU(s) trained in the principles of PMCA and gaining actual experience in facilitating gender-responsive value chain innovation Policy â€¢Local ordinance formulated for adoption by the three (3) LGUs of the selected sites to promote gendered PMCA Places and Partnerships â€¢Collaboration among value chain actors with LGU â€¢Link value chains to Food Innovation Centers	UPLB	Communities â€¢ Livelihood opportunities in new value chains accessible to rural women â€¢ Sustainable utilization of indigenous root/tuber crops â€¢ Capacity development in value chain engagement Local government units - Capacity building in facilitating value chain development - Development of a guide for a crisis- and gender-responsive approach for facilitating value chains Researchers/RDE â€¢ Methodological innovation in facilitating crisis- and gender-responsive value chain development â€¢ Empirical data on gender dynamics, relations as well as benefits and challenges in a crisis- and gender-responsive value chain	1-Jul-21	30-Jun-23	ONGOING	5,000,000	3,150,894

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
	Enhancing the Development of Sweetpotato Food Value Chains in Central Luzon, Albay, Leyte and Samar, and Linking with Related Industries Phase 2	KRA 3: Rapid, Inclusive and Sustained Economic Growth	From the SP-ISP Phase 1, Tan, et al (2018), PhilRootcrops-VSU, has developed a portable vacuum frying system which costs about half and double the capacity compared to the existing vacuum frying system in the market. This is now used for the production of vacuum-fried sweetpotato products. The project was able to develop 2 types of portable vacuum fryers: the single-cylinder and the twin-cylinder vacuum fryers. The main component in the system that generates the vacuum is the water jet ejector system that replaces the expended vacuum pump. The water jet ejector system only uses the ordinary water pump for it to generate the vacuum, hence, less moving parts, and therefore low maintenance cost. Furthermore, the developed vacuum frying system does not need a condenser unit to remove the moisture in the vapor before entering the vacuum pump, as in the case of the conventional system.	Publications: - SP zero-waste system - (1) SP Products Development - (1) Value chain mapping and performance analysis guide - (2) ISN brochures â€" technology investment portfolio, and products profile: SP products from the zero-waste system Patents/IP: - Utility model for technically and economically improved portable vacuum fryer for Sweetpotato and other rootcrops Products: - 3 Food Products - Improved packaging and standards compliance People Services: - Capacitated partners and beneficiaries Places and Partnerships: - Samahang Nayon Potomolok (SN Polo) â€" Polomolok, South Cotabato; Camote Creations, Daraga Albay, Tarlac DA Experiment Station Policy: - Recommendation to streamline technology transfer especially of machineries - Recommendation to improve sustainability especially of MSE value chains	VSU	Primary: - 22 SP food MSEs, ca. 1000 farmers - Consumers, health food businesses Secondary: - Extension and development workers - Researchers, academician	1-Jun-20	28-Feb-22	ONGOING	5,000,000	860,493
	Enhancing the Growth of Bamboo-based Enterprises in Laguna	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project will examine the various issues and challenges surrounding the enterprise system and develop the necessary interventions to help them gain the access to technologies, markets, inputs and services like finance and training, in ways that are commercially viable. The development model will be based on the identification of key stakeholders and their key challenges across the value chain to develop high value economic opportunities for the enterprises. Based on the results of the analysis, tailor-i-t interventions will be packaged to address the specii-c needs of the entrepreneurs and the enterprises around the realities of the industry to i-nd solutions to constraints that hinder its development.	Publication â— At least two (2) articles based on the results of the project ProductÂ— Value chain maps â— Intervention/strategy models â— Improved products of identified enterprisesPeople ServicesÂ— At least twenty (20) women and men personnel from 8 enterprises trained on technical and managerial skills Partnerships â— At least (10) partnerships developed with LGUs, value chain actors and enabling players Policy â— At least one (1) policy recommendation to address constraints identifiedEconomic Impact The potential economic impact as a result of the interventions may include: â— increase in income, better operational efficiency, improved competitiveness, and improved livelihood, among others, not just for the involved enterprises but also the key players in the value chain.Social ImpactThe potential social impacts could be: â— better vertical and horizontal relationships and strengthened partnerships between key players along the value chain that would result in a more healthy and conducive environment for the industryâ€™s development. â— more people venturing into bamboo-related livelihood activities.	FPRDI	Women and men bamboo producers and processors in Laguna, policy-makers, R&D agencies, and service providers are the target beneficiaries of the project.Â	21-Nov-21	30-Apr-23	ONGOING	3,500,000	2,325,036
	Enhancing the Growth of Crossbred Dairy Buffalo-based Enterprises in San Agustin, Isabela	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This proposal will build from the results of the project on the strengthening of the San Agustin crossbred carabao-based enterprise development (CBED) model. The CBED model organized a group of 13 dairy producers associations (equivalent to 103 smallholder farmers) to produce milk and bring it to a central processing plant under the management of San Agustin Dairy Cooperative (SADACO) for collective processing and marketing. SADACO was established in 2010 through the partnership of the PCC and the local government unit of San Agustin.As a dairy marketing cooperative, SADACO provided farmers with a marketing outlet. Through the PCAARRD-PCC project, technical training, equipment and supplies were provided; linkages were established with potential markets; and a system for M&E was established. In fact, a municipal ordinance was even developed to regulate the sale and slaughter of crossbred buffaloes and institutionalizing a municipal crossbred carabao development program for the municipality. The implementing rules and regulations, however, are yet to be developed.	Publication: At least two (2) articles based on the results of the project (including one policy brief)Patent: Not applicableProduct: Intervention/strategy models; improved and/or new products of identified enterprises; improved dairy-buffalo based-based products and/or enterprisesPeople: At least 100 women and men personnel from 13 associations trained on technical and managerial skills.Place: At least (10) partnerships developed with LGUs, value chain actors and enabling playersPolicy: At least one (1) implementing rules and regulation developed for institutionalizing development programs for the crossbred carabao industryÂ Policy recommendation for further development of the crossbred dairy industry	UPLB	Women and men dairy-buffalo based producers and processors in San Agustin, Isabela, policymakers, R&D agencies, and service providers are the target beneficiaries of the project.	1-Dec-21	30-Nov-23	ONGOING	5,000,000	2,713,246
	Gender Analysis Framework and Monitoring and Evaluation Tools in gender Responsive AANR Development Projects (GAME Tools in AANR)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Gender-analysis frameworks aim to provide methods to gather and use sex-disaggregated and gender-related data and information to inform development interventions at various stages, that is, from project/program conception and design through to evaluation. GA frameworks and M&E tools emerged in response GAME Tools in AANR 2 to the realization of the significance in development projects of the differing roles of men and women. Before then, until the 1980s, development perspective was gender neutral, assuming that the impact of development projects is equal to both men and women. The high rate of failure of development policies, programs and projects was attributed in part to the neglect or lack of knowledge of womenâ€™s productive and reproductive roles. Thus, the demand emerged for methods which could assist development planners to gather data from which to make informed decisions for the benefit of both men and women, prevent possible negative effects, and make development more effective and efficient.	Publication 1 technical journal publication Products 1. Questionnaires to complement the HGDG descriptorsâ€™ 10 core elements of a gender responsive AANR projects 2. Simplified guide to using gender analysis framework and M&E tools suitable for R&D projects (GAME Tools) 3. Training-workshops for development planners (ISP Managers) and project implementers 4. Consultative planning workshops with project staff, development planners (ISP Managers), representative project implementers and experts of various fields (GAD and AANR R&D sectors) 5. Three (3) training modules/materials to enable GAME tools users to have harmonized understanding of the tools and vocabularies, namely basic GAD concepts, introduction to gender analysis, use of GAME tools for AANR People and Services The capacity building to use the GAME tools for AANR projects would result to the development of partnerships with PCAARRD and its AANR networks. Places and Partnerships 1. Partnership with the PCAARRD NAARRDN networks to ensure that the gender impact of the PCAARRD funded projects are determined and used for policy direction 2. Possible partnership with PCW	UPLB	AANR researchers/ project implementers and development planners/ ISP managers, the men and women in agriculture, aquatic and natural resources sector, including studies in socio-economic so that their differential needs and roles would be identified, and that they would benefit equally on the impacts of PCAARRD funded development projects, other R&D agencies, SUCs, and the Philippine Commission on Women.	1-Jun-21	31-May-23	ONGOING	5,000,000	2,696,153
	Impact Assessment of the Balik Scientist Program (BSP) under the Department of Science and Technology	KRA 3: Rapid, Inclusive and Sustained Economic Growth	DOST launched the Balik Scientist Program (BSP) in 1975 to address the brain drain phenomena in the Philippines. The BSP was meant to entice scientists, researchers, engineers and other skilled workers to return to the Philippines to share their knowledge and expertise in building the country's human resource capacity. In return, several benefits and incentives were afforded to those who took part in the program such as insurance, daily subsistence allowance, research fund, housing and transportation allowance, among others. BSP is on its 45th year this 2020 and the outputs, outcomes, and impacts will have to be measured against its target. Further, the need to investigate what has been the contribution of BSP in the decreasing number of researchers in the country and in lessening the development gap, specifically in S&T will have to be done as well.	Publications: Impact Assessment Bulletin and Journal Article People Services: Targeted seminar series for the presentation of findings to relevant stakeholders Policy: Policy options for the enhancement of BSP	UPLB	DOST, implementing partner institutions of BSP scientists, researchers and R&D personnel	1-Jun-21	30-Sep-22	ONGOING	5,000,000	3,806,447

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	Impact Assessment of the Integrated and Sustainable Development Program for the Shrimp Industry	KRA 3: Rapid, Inclusive and Sustained Economic Growth	As support to the shrimp industry, the DOST-PCAARRD implemented an R&D program entitled â€œIntegrated and Sustainable Development Program for the Shrimp Industryâ€ in June 2011 to August 2014. The project was implemented by researchers from UP Visayas and partners that included SEAFDEC AQD, and the private sector. The main tasks involved were two-fold (Corre and Amar 2014): developing techniques for the production of the captive broodstocks and spawners, and developing sustainable and environmentally-friendly production techniques. The program has five project components: Project 1. Development of techniques for the production of good quality captive Penaeus monodon broodstock and spawners Project 2. Development of sustainable and environment-friendly production techniques for Penaeus monodon Project 3. Handling protocols and value chain analysis for fresh/frozen/chilled panaeid shrimps reared in commercial and organic culture systems Project 4. Reducing losses in the shrimp industry using developed technologies Project 5. Improvement of the reproductive performance in captive Penaues monodon The DOST-PCAARRD funded shrimp R&D program had a total budget of PhP 64.45 million for the three-year duration. With that time difference, the impacts of the projects are sought to see their performance towards their set goals.	Publication: â€ 1A Bulletin â€ One (1) draft for journal article Policy: â€ Policy options for the enhancement of uptake of the technologies generated from the shrimp R&D program People and services: â€ 4 researchers trained on the integrated IA approach	UPV	This IA project will provide an assessment and account of the Integrated and Sustainable Development Program, which the following may find useful: a) Funding agencies and research and development institutions; b) Adopters (and potential adopters) of shrimp technologies (e.g. hatchery farms and grow-out farms); c) Farm managers and other stakeholders in the shrimp/aquaculture industry; and d) Scientists interested in shrimp technologies.	1-Oct-20	30-Jun-22	ONGOING	3,600,000	661,890
	Innovation Willingness and Readiness of Fish and Seafood Processing Micro, Small and Medium Enterprises (MSMEs) for Food Safety Standards	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This study aims to assess willingness, capability, and readiness of fish and seafood processing MSMEs to innovate for food safety. Understanding these firm characteristics precedes that of improving innovation adoption. This study further aims to contribute to the current limited scholarly work on innovation capability in the Philippines and provide policy support to existing laws promoting innovation among MSMEs with particular focus on food safety.	Publication: At least one (1) article in a refereed journal on innovation capability of processing MSMEs in fish and seafood sector At least four (4) technical reports (i.e. 3 progress, 1 terminal) At least one (1) policy brief relating to food safety and innovation of processing MSME in fish and seafood sectorProduct: â— At least five (5) innovation capability intervention models for the processing MSMEs in the fish and seafood sectorPeople and Services At least 20 men and women staff of processing MSMEs in the fish and seafood sector provided with specific aspects of their operation that need to be improved for chances of successful innovation activities. Partnership: â— At least 10 partnerships established comprising of regional Bureau of Fisheries and Aquatic Resources (BFAR), Department of Trade and Industry (DTI), and local government unitPolicy: â— Policy recommendations useful to government agencies' more focused effort on promoting innovation adoption among MSMEs	UPLB	Small and micro-enterprises (coastal and marine processing) Local government units governing coastal communities National GovernmentÃ‚Â Agencies involved in promoting innovation	16-Dec-21	15-Dec-23	ONGOING	5,000,000	3,056,531
	Institutionalization of Guidelines on Watershed-Based Integrated Area Land Use Planning Towards Resiliency	KRA 3: Rapid, Inclusive and Sustained Economic Growth	To facilitate the institutionalization of WILUP, a systematic advocacy program is needed. Fragmented advocacy efforts to adopt watershed-based approaches to local land use and development planning in the past had limited success despite existing guidelines. Comprehensive systematic advocacy program directed to LGUs, NGAs, policy makers, academe, among others is needed to promote sufficient understanding on WILUP covering its fundamental basis, its importance, and how to operationalize it. This advocacy program will need to employ blended strategies including use of printed IEC materials, AVPs, social media, fora and workshops in order to reach different target audience. It will also need for piloting WILUP to provide a venue for showcasing actual operationalization of WILUP, experiential learning, and capacity building. Likewise, it will also be instrumental to facilitate the formation of core group of advocacy champions consisting of prominent personalities from the government and civil society. Advocacy for the passage of related national legislations such as the Proposed National Land Use Act and Sustainable Forest Management Act that both provides for the adoption of watershed and ecosystem-based approach to land use planning and development should also be included. Towards the end of operationalizing the WILUP this advocacy project proposal is submitted for funding support.	6Ps metrics: 1. Publications a.One (1) advocacy kit containing the following: i. 1 policy briefer ii.1 brochure about the policy reform being advocated iii.Print and digital IEC materials on watershed resiliency and the need for watershed-based land use planning b.WILUP tool kit: Guidelines on how to do WILUP, other reference materials c.Publication / stories from the pilot-testing experience: good practices, challenges encountered 2.Product a.Guidelines on WILUP 3.People Services a.1 Policy forum for targeted audience organized b.1 training among land use planners and practitioners c.(At least) 1 round table discussion on WILUP 4.Places and Partnerships a.Partnership with LGUs on the pilot-testing of WILUP b.Agreements in in the conduct of advocacy activities among DOST-PCAARRD, implementing agencies, others. c.Partnership with DENR, DILG, DHSUD, DA, DAR, DPWH, CCC, NDRRMC, NEDA, and other concerned agencies 5.Policies a.Draft policy documents on the adoption of Guidelines to WILUP b.Draft proposed modifications of salient sections of concerned DAOs, Technical Bulletins and Guidelines c.Draft CLUP (for adoption through SB Resolution and LGU Ordinance)	UPLB	At the end of the project, it is expected to benefit the following sectors: â€Fisherfolk and lake-dependent communities in Laguna de Bay â€Farmers and communities within the Baroro watershed in San Gabriel, La Union â€Laguna Lake Development Authority â€Department of Environment and Natural Resources â€Department of Interior and Local Government â€Department of Human Settlements and Urban Development â€Local Government Units, including the Province of Laguna and La Union	16-Oct-21	15-Oct-23	ONGOING	8,166,318	4,935,107
	Market Study of the Smarter Approaches to Reinvigorate Agriculture as an Industry in the Philippines (SARAI) - Developed Technologies for rice and corn (Old Title: Assessment of Cost and Benefits of Various Crop Management Options using Crop Advisories of SARAI Advisory System (Assessing the Market Potential of Selected Technological Outputs of SARAI))	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Farmers must be assisted in becoming wiser in their farm decision making process by ensuring that they are knowledgeable in how utilize weather and climate forecasting results provided by SARAI along with the market trends of the agricultural commodities they intend to plant. As such, the costs and benefits to be incurred by the farmer in relation to utilizing a combination of SARAI technological outputs would be critical in understanding its likelihood of adoption both in the short- and the long-term farming decision scenarios. Given that this kind of analysis is usually absent in many technological interventions in the agricultural sector in the Philippines in general and in the case of SARAI in particular, this study will specifically assess the costs and benefits of various crop management options using technological outputs of SARAI, and to be complemented with market analysis of technological outputs of the SARAI program. Combining all these information, once available in due time, will surely afford all government planners and regulators a clear basis as to how large-scale agricultural technological systems interventions like SARAI be made more effective and responsive to the need of its target farmer beneficiaries. Thereby ensuring that massive investment on large agricultural technological systems will indeed redound to substantial net benefits.	Publication: â€ One (1) information bulletin â€ One (1) draft journal for publication in ISI journal Policy: â€ Policy advocacy for the enhancement of uptake of the advisory system People and services: â€ 5 researchers trained on choice experiment, demand forecasting, and crop management options analysis	UPLB	Local farmers, cooperatives, and organizations in the Philippines Government agencies such as Department of Agriculture (DA) and the Department of Science and Technology (DOST)	1-Jul-20	30-Jun-22	ONGOING	4,934,693	1,528,293
	Policy Advocacy for the Adoption of Ecotourism as a Local Sustainable Development Solution for Laguna de Bay's Resource Use and Management	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project consists of lobbying the LLDA and concerned local government units to adopt the proposed management scheme and creating public awareness about the new management system that leads to Laguna de Baryâ€™s sustainable resource use and management and increasing its income generating potential.	1. Product a. S&T-based model for LGU tourism development plan 2. Publication a. One (1) advocacy kit containing the following: i. 1 policy briefer ii. 1 brochure about the policy reform being advocated iii. Print and digital IEC materials on watershed resiliency and the need for watershed-based land use planning 3. Policy a. Policy on implementing a lake-based tourism management for Laguna de Bay through policy documents 4. People and services a. 1 policy forum for targeted audience organized b. 1 seminar for general audience organized 5. Places and partnership a. Agreements in the conduct of advocacy activities among DOST-PCAARRD, implementing agencies, others b. Partnership with LLDA as potential co-implementor 1. Economic Impacts a. Increased livelihood opportunities for communities in the Laguna de Bay area b. Improved Economic Value and Sustainability of the Laguna de Bay 2. Social Impacts a. Preservation and Conservation of Ecological Characters in Laguna de Bay b. Protection and Conservation of Adjacent Ecosystems	UPLB	At the end of the project, it is expected to benefit the following sectors: â€ Fisherfolk and lake-dependent communities in Laguna de Bay â€ Laguna Lake Development Authority â€ Department of Environment and Natural Resources-RBCO â€ Department of Interior and Local Government â€ DSHUD â€ Local Government Units, including the Province of Laguna and La Union	1-Jul-21	30-Sep-22	ONGOING	5,000,000	4,144,266

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
	Research for Development: Payment for Ecosystem Services Outcome for Sustainable Water Provision (R4D: PESO SWaP) in Barobbob Watershed, Nueva Vizcaya, Philippines	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Implementing payment for ecosystem services (PES) mechanism as an approach towards sustainability is a relatively novel approach in environmental conservation. PES mechanisms create a market for ecosystem services by making users/beneficiaries pay for the services while compensating conservation activities of service providers. While the mechanism has already been implemented in several areas in the country, this action research is needed to design a PESmechanism tailor-fit to the needs of the Barobbob watershed stakeholders to be successful. This study consciously integrates the science, economics, and institutions and governance aspects of PES while continuously engaging and capacitating stakeholders. The results of this study are envisioned to provide inputs to a national policy on PES. A national policy may stimulate the establishment of PES mechanisms across the country, boosting efforts for sustainability.	Product â€¢Implementation and monitoring plan for PES â€¢Water supply provision map/model â€¢Process documentation of PES design and implementation People and services â€¢Capacity building of stakeholders and project staff â€¢Capacity building of faculty and staff of the local university (Nueva Vizcaya State University) Places and partnership â€¢Partnership with LGU, NVSU, water district, NIA (if applicable), farmer organizations, NGAs â€¢Memorandum of Agreement with NVSU Policy â€¢PES scheme initiated â€¢Local ordinance initiating PES â€¢Policy outputs as inputs to advocacy on national act on PES Publication â€¢IEC materials: leaflets, flyers and brochures, training materials â€¢Training modules (PowerPoint) â€¢Policy brief â€¢At least two complete drafts ready for submission to journals	UPLB	The PES mechanism to be implemented in Barobbob watershed will benefit the local community. Upland dwellers will receive income from practicing sustainable management and downstream households, farmers, farmers organizations and the local water district will benefit from improved water quality and stable water supply. Throughout the project, the mentioned stakeholders and representatives from the LGU and the academe will be capacitated regarding the design and implementation of PES.	1-Jul-21	30-Jun-23	ONGOING	5,000,000	2,553,082
	Valuation of Forest Ecosystem Services of Mt. Malindang Range Natural Park (MMRNP), Misamis Occidental	KRA 3: Rapid, Inclusive and Sustained Economic Growth	With this, the project aims to conduct valuation of MMRNP ecosystem services using Contingent Valuation Method (CVM).Â The three important priority resources to be valued in this project are forest, water and tourism. This project study is timely and urgent to determine how the biophysical resources and selected ecosystem services affect the socio-economic condition of the stakeholders.Â Their access and benefits derived from MMRNP will be determined, the Knowledge, Attitude, Practices of households towards the issues concerning the park will be assessed, use and passive value of the selective ecosystem services will be estimated, and factors affecting WTP for conservation will be identified. Ultimately, policy options for biodiversity conservation that focus on innovative financing mechanisms through Payment of Ecosystem Services (PES) and Access to Benefit Sharing (ABS) schemes will be formulated and recommended. After determining the Willingness to Pay (WTP) of selected households in the study area, analysis will eventually lead to an acceptable PES and ABS schemes which are doable and applicable in Misamis Occidental.Â These will be the innovative financing mechanism for biodiversity conservation which will be used to generate funds and resources to support the continuous conservation of MMRNP. This will be supported by appropriate policies which will be enforced by the concerned agencies, LGUs, PAMB, DENR and other sectors directly involved in the parkâ€™s conservation and protection. Ultimately, the enhanced conservation and protection effort involving all the stakeholders will positively affect ecological health and will be a vital step towards ensuring water sufficiency, food security and climate resiliency in the Misamis Occidental province.Â Â	1. Publication â— One (1) story bookâ— Two (2) modules (environmental classes and TOT) â— 5 poster designs for information dissemination (CEPA)â— 2 billboards design for information dissemination (CEPA) â— One (1) policy briefÂ â— 5 articles for journal publicationÂ 2. ProductÂ Â -PES mechanism involving the four (4) major Water Districts in Misamis Occidental and adjacent Zamboanga Peninsula and integrating PES in their payments.Â Â -Ecosystem Accounts for MMRNPÂ 3.Â People ServiceÂ At least 10 staff from the partners agencies provided with seminar/training on ecosystem accounts.Â 4.Â Place and PartnershipÂ Partnership established among Misamis University, MMRNP-PAMB, MMRNP-PAMO, local water districts and LGUs surrounding MMRNP.Â 5. PolicyÂ -Policy recommendations for at least two (2) local policies/ordinances/resolutions-Policy recommendations or inputs to the protected area management plan for MMRNP	MU	The primary beneficiaries of this project will be the local communities that will be informed of the total economic value of MMRNP through scientific methods. The next important beneficiaries include the MMRNP-PAMB and Local Government Units in Misamis Occidental who will use the data for the protected area management conservation and protection plans, programs, projects and activities. In likely manner, the project will enrich the academeâ€™s competency to improve their instruction, research and extension. The private sectors and NGOâ€™s can also utilize data for their respective priority environmental programs	16-Dec-21	15-Dec-23	ONGOING	5,000,000	3,050,802
Agroforestry Support Program for Enhancing Resiliency of Community-based Forest Management Areas (ASPIRE-CBFM)	Project 1. Development of Agroforestry Support System for Sustainable CBFM Areas	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This proposed project will focus on the capacity-building programs of the upland farmers, existing peopleâ€™s organizations (POs), concerned government organizations/agencies (GOs/GAs) and other key stakeholders to improve processes, networking, marketing and policy support in CBFM communities. Up-to-date knowledge and information on various aspects of agroforestry as the main production technology of CBFM is a key towards promoting sustainable CBFM implementation. Thus, this project will also highlight the Agroforestry Database Information System (ADISS) that will provide and disseminate information about the practice of agroforestry in selected and specific CBFM sites in CALABARZON areas with mostly records and information generated by associated projects within the program. The system will generate timely and relevant information about promoting agroforestry technologies and models for farmer beneficiaries and all other users in support for their decisions demanding detailed information about agroforestry products and services of CBFM sites. Stakeholders will be capacitated and manual will be developed to ensure continuing maintenance and updates of the database after project completion.	1 baseline data 4 sites measured (level of resiliency) 4 sites identified (land capability class) 4 ALCAMS applied 1 agroforestry design for 4 sites developed, established and maintained 1 AF database and info system developed and maintained 1 handbook on database management 5 flyers produced 4 training modules 2 scientific publication 1 guidebook 80 key leaders and beneficiaries identified and trained per site 20 forestry students carried out and conducted their research and practicum in the sites 8 training on agroforestry conducted 20 personnel from LGUs, DENR-ERDB, DENR CENRO and PENRO in Region IVA and POs in four sites trained on agroforestry database and information system Technical and organizational capabilities of four (4) CBFM POs strengthened 4 local partnerships strengthened Soil erosion in four (4) agroforestry models within the tolerable soil loss rate of less than 10 tons/ha/year 4 organizational policies 1 policy forum convened 1 policy recommendation 10 MOAs forged 9 copyrights filed 2 copyright on guidebook	UPLB	CBFM Beneficiaries	1-Jul-19	30-Jun-22	ONGOING	14,822,836	4,023,519
Agroforestry Support Program for Enhancing Resiliency of Community-based Forest Management Areas (ASPIRE-CBFM)	Project 2. Assessment of Ecological Services of Agroforestry in Selected CBFM Areas	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The Philippines is known as one of the megadiverse countries in terms of flora and fauna. Addressing biodiversity conservation through various strategies will give a healthful and balanced ecology. CBFM was adopted as the national strategy to ensure the sustainable development of the country's forestlands resources. It is a key component in the conservation of biodiversity in the Philippines. Under CBFM is agroforestry which is one of the successful and effective activities leading to more ecological and economic benefits. Agroforestry activities vary in some ways. Assessment of agroforestry in various sites where it is implemented will give the baseline information/data on the ecological and even in the socio-economic dimensions of the area.	8 CBFM Biophysical profiles 4 general recommendations on the use of CBFM areas 4 sets of info effects of interventions established 1 handbok 1 comparative analysis of the soil physico-chemical properties, soil fertility, carbon stocks, biodiversity of flora and fauna and water quality and quantity of the four (4) CBFM areas based on the interventions made by Project 1 8 PO members oriented 1 GREAT Scholar 30 technical people oriented and trained 4 IEC materials 2 technical/ popular articles prepared 2 technical publications 1 guidebook 2 flyers and brochures 10 MOAs forged 1 policy recommendations 10 copyrights filed	ERDB	CBFM beneficiaries	1-Jul-19	30-Jun-22	ONGOING	8,494,080	1,816,502
Agroforestry Support Program for Enhancing Resiliency of Community-based Forest Management Areas (ASPIRE-CBFM)	Project 3. Community Empowerment thru S&T (CEST) Program for Community-based Forest Managment (CBFM) Sites	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The Department of Science and Technology â€" CALABARZON (DOST CALABARZON) has initiated various poverty reduction projects which focuses on achieving sustainable solutions to existing and emerging pressing issues in the country. One of which is the program on â€œCommunity Empowerment thru Science and Technologyâ€ dubbed as the CEST Program. The said program aims to empower the poor and the marginalized sector and to improve the quality of their life thru science and technology. Packaged S&T interventions are focused to five (5) entry points: Health and Nutrition, Water and Sanitation, Basic Education Literacy, Economic Enterprise Development, and Disaster Risk Reduction/Climate Change Mitigation. As part of poverty elimination, the use of forest resources will help lift a householdâ€™s status. In the publication, â€œManaging Ecosystems to Fight Povertyâ€, four main strategies are identified to improve the poverty reduction potential of local ecosystems. These include: 1.Strengthening resource management to ensure higher productivity and greater returns; 2.Improving governance so that the poor are empowered to "profit from nature"; 3.Commercializing goods and services through marketing and enterprise development; 4.Developing mechanisms for payments for environmental services (WRI et al., 2005). The empowerment of CBFM communities, will take place thru capacity-building of the upland farmers and existing peopleâ€™s organizations for Economic Enterprise Development while also supporting other aspects of improvement in Health and Nutrition, Education, DRR/CCA, and Water and Sanitation; these holistic approach will be part of the CEST Program for CBFM areas.	4 CNA profile produced 4 assessment reports 4 profitability analysis produced 4 units ARG 1 unit LGLIDS 1 unit WLMS 2 units EWS 80 CBFM members participated in the CNA/TNA, trained on livelihood equipment 14 trainings conducted 13 MOAs forged 4 linkages 16 IEC materials produced 4 AVPs produced 16 copyrights filed	DOST 4A	CBFM Beneficiaries	1-Jul-19	30-Jun-22	ONGOING	9,424,458	2,184,866

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Establishment of DOST-PCAARRD Science for the Convergence of Agriculture and Tourism (SciCAT)	Project 1. Providing Interventions and Accelerating Capability through Assessment & Mentorship Towards Science for the Convergence of Agriculture & Tourism (PI=ACA-SciCAT) (Old Title: Science and Technology-based Tourism for Agri-Aqua & Natural Resources (STAR))	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The Project CBM Program for SciCAT will be focusing on the transformation of the identified potential MS farm sites. This project will facilitate the building of entrepreneurial and managerial skills of the MSF. It will require soft (i.e. marketing and financial competence) and hard (i.e. physical structure and landscape) components. The transformation of the traditional farm into SciCAT will require the following key activities: 1. Profiling â€" Determine baseline data, current condition/status of multi sectors that may affect the proposed site. 2. Feasibility Study â€" Determine products, organization, business model, POT, etc. that will yield the best profit margin and most sustainable. 3. Business Planning â€" Determine strategies for establishing the SciCAT Farm and how to transform known risks and weaknesses into opportunities. 4. Mentorship Program â€" MS / beneficiaries will be guided and coached from starting the SciCAT Farm to operation and sustainability. 5. Landscape and Construction- MS will be guided in the art of modifying their traditional farm into a farm tourism site thru landscape planning and construction of tourism facilities inside their farm. Data will be gathered through focus group discussion, surveys, secondary data from national and local government, and experts â€™ knowledge/advise.	1. Established 7 SciCAT sites in the following areas: 1.1 La Trinidad, Benguet 1.2 Sto. Tomas, La Union 1.3 Los Banos, Laguna 1.4 Indang, Cavite 1.5 Bilar, Bohol 1.6 Banay-banay, Davao Oriental 1.7 Malaybalay City, Bukidnon 2. 6 MS and 1 institutional farm Trained and Mentored; 3. Align 7 SciCAT sites to the DOT initial accreditation requirements; 4. Demonstrated optimal farm productivity and profitability in each SciCAT site; 5. SciCAT owner established linkages with co-farmers, marketing associations, students, government institutions, among others; 6. Developed 7 Profiling Reports, Feasibility Studies, Farm Enterprise plan, and Layout & Design plan; 7. Developed 12 Mentoring Reports for the whole duration of the program;	UPD	MSF community of chosen sites	1-Aug-18	31-May-22	ONGOING	17,230,253	2,421,503
Establishment of DOST-PCAARRD Science for the Convergence of Agriculture and Tourism (SciCAT)	Project 6. Highland Science for the Convergence of Agriculture and Tourism: Benguet Landscape and Ornamental Offerings of a Magsasaka Sitentista (Highland SciCAT: BLOOMS) Batch 2(Old Title: Highland S&T-Based Tourism for Agriculture, Aquatic and Natural Resources: Benguet Landscape and Ornamental Offerings of Magsasaka Siyentista (Highland STAR:BLOOMS))	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project will be in collaboration with Magsasaka Siyentista Andy Colte. Activities shall be geared towards the improvement of his cut flower farm and the surrounding farms operated by his relatives. In order to give prospective visitors a pleasant experience in the farm, basic amenities of a farm tourist site shall be provided like parking space, briefing/orientation area, photo spots, toilet, footpath, farm store, clean water supply. Landscaped centerpieces will be strategically located in the farm to enhance the natural beauty of the blooms.	A.Products: 1.At least 2 POTs downloaded 2.Potted plants for sale 3.Flora-inspired souvenir items B.People and Services: 1.At least 20 identified POT adopters, 4 actual POT adopters 2.At least 200 trained farmers 3.At least 700 trained students 4.At least 100 monthly average visitors/tourists C.Publications: 1.At least 5 IEC Materials (1 video documentary about the farm, 2 posters, IEC materials on POTs) 2.2 Ornamental Plant production guides 3.10 press release news/ feature articles 4.Website for the Farm Tourism Site 5.1 annual progress report 6.1 terminal report D.Patents: 1.Copyright on IEC materials 2.Copyright on Ornamental Plant Production Guides 3.Trademark for SciCAT logo E.Places and Partnerships: 1.1 SciCAT site 2.MOA forged with MS Andy Colte, La Trinidad Cutflower and Ornamental Growers Association, La Trinidad LGU & DA- ATI	BSU	Farmers, farm entrepreneurs, private and government agencies/organizations, SUCs, students, farming enthusiast and the like	1-Oct-19	31-Mar-22	ONGOING	4,705,622	1,273,665
Establishment of DOST-PCAARRD Science for the Convergence of Agriculture and Tourism (SciCAT)	Project 7. Enhancing Pera's Farm for SciCAT Farm Development in La Union - Batch 2(Old Title: Enhancing Pera's Farm for STAR Farm Tourism Development in La Union)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project aims to transform Magsasaka-Siyentista Eliseo Rocapor's farm into SciCAT Farm Enterprises that will serve as the community â€™s main tourist farm attraction leading to the creation of employment and entrepreneurship opportunities in the community.	A.Products: 1.At least 2 POTs downloaded B.People and Services: 1.At least 20 identified POT adopters, 4 actual POT adopters 2.At least 10 jobs generated 3.At least 100 monthly average visitors/tourists 4.At least 100 farmers/farming enthusiasts trained C.Publications: 1.At least 1 set of IEC materials 2.At least 1 social media site 3.1 SciCAT techno video 4.1 terminal report D.Patents: 1.At least 1 copyrighted IEC materials 2.1 Trademark (logo, signage, etc.) E.Places and Partnerships: 1.1 SciCAT site 2.MOA signed with ATI, LGU, Magsasaka-Siyentista (MS) & Tourism Office F.Policies: 1.1 Municipal resolution recognizing SciCAT site as municipal tourist destination	DMMMSU	MS, Farming communities and LGUs	1-Oct-19	31-Mar-22	ONGOING	3,695,068	614,720
Establishment of DOST-PCAARRD Science for the Convergence of Agriculture and Tourism (SciCAT)	Project 8. Establishment of Science for the Convergence of Agriculture and Tourism (SciCAT) Farm in Sitio Lagiwliw, Zamora, Bilar, Bohol - Batch 2(Old Title: Establishment of Science and Technology-based Tourism for Agriculture, Aquatic and Natural Resoures (STAR) Farm in Bohol)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project will be conducted at BISU adopted village, the Sitio Lagiwliw in Zamora, Bilar, Bohol. This village was adopted during the establishment of the Climate Change Center in which it is named as â€œGreen Village.â€ The village has 20 household mainly engaged in farming activities such as production of rice, corn, banana, coconut, fruit trees, vegetables and other crops and management of poultry, pig, and livestock.	A.Products: 1.At least 2 POTs downloaded B.People and Services: 1.At least 20 identified POT adopters, 4 actual POT adopters 2.At least 100 monthly average visitors/tourists 3.At least 100 trained farm owners and interested individuals C.Publications: 1.At least 1 social media site 2.1 SciCAT technology promotional video 3.At least 1 brochure 4.At least 3 flyers 5.At least 10 mentoring (technical) reports 6.At least 8 progress reports 7.1 Terminal report D.Patents: 1.At least 1 copyright on IEC materials 2.1 Trademark (logo, signage, etc.) E.Places and Partnerships: 1.1 SciCAT site 2.MOA signed with DOT/Tourism Office, DA-ATI, LGU, and Magsasaka-Siyentista (MS) F.Policies: 1.1 Municipal resolution recognizing SciCAT site as municipal tourist destination	BISU	â€CPeople in Sitio Lagiwliw â€CMS (Mr. Adelo D. Mangaya-ay) â€CFarm owners in the selected site â€CLocal and foreign tourists â€CFarm entrepreneurs â€CStudents â€COther interested individuals and groups	1-Oct-19	31-Mar-22	ONGOING	3,669,167	686,599
S&T Community Based Program for Inclusive Development (STC4ID)	Project 1. Capacity Development and Program Monitoring and Evaluation for S&T Community-based Project for Inclusive Development (STC4ID) State Universities and Colleges (SUCs) (Old Title: Capacity Development Program for Science and Technology for Inclusive Development (STC4ID) Partners)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project is designed for systematic capacity building, information, education and communication development and project management of the STC4ID team members and community partners in five sites namely Bukidnon, Sultan Kudarat, Sulu, Siquijor and Sorsogon. The project will be implemented in the following three major components: The Capacity Building component will focus on social technologies for institution building (STIB); sustainable livelihood thru community enterprise development (SLED); and providing enabling mechanisms, ensuring sustainability (EMES) of the Community enterprise. This is a social preparation stage and means to capacitate the STC4ID project team members towards inclusive development. The Program Management and Evaluation as well Information, Education, and Communication (IEC) Development will be be observed all throughout the project duration. The IEC development will highlight the promotion of technology adoption in STC4ID sites.	1 capacity building activities for STC4ID project team members conducted 30 project team members capacitated 1 Training Modules developed 5 Community enterprise sustainability plan developed 1 IEC material produced 1 publishable paper submitted 1 AVP Produced	UPLB	Project Team Members of STC4ID in five SUCs partners	1-Jan-19	31-Jan-22	ONGOING	11,207,578	2,508,523

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S&T Community Based Program for Inclusive Development (STC4ID)	Project 2. S&T Community-Based Project For Inclusive Development (STC4ID) through the Community-based Livelihood Improvement for Bukidnons (Project Climb) (Old Title: S&T Community-based Livelihood Improvement for Bukidnons (PROJECT Climb))	KRA 3: Rapid, Inclusive and Sustained Economic Growth	In 2015, Bukidnon was identified as the 6th impoverished province in the Philippines having a poverty incidence of 58.7% (PSA, 2015). Of the 20 towns of Bukidnon, Maramag has a relatively low incidence of poverty (47.80%) with about 30% of its households have income below the food threshold level. However, Barangay Kiharong ranks 4th of the 20 barangays in the municipality with high poverty incidence of 64.90% and low food threshold level among 54.2% of its households. Barangay Kiharong is situated approximately 17 km from the town proper of Maramag and around 21 km from the nearest city of Valencia in the north. It is connected with the nearby barangays through the existing provincial and barangay roads being located 7km from the national Sayre highway. It has a total land area of 798.47 hectares covering 1.53% of the total land area of Maramag township. The barangay is subdivided into eight (8) puroks (hamlets) with a total population of 1,588 comprising a mixture of different IP groups. Barangay Kiharong hosts the tributaries of the Upper Pulangui River including the Nabalintungan/Kulaman River watershed covering 358.27 hectares and the Kibalagon Creek. The Upper Pulangui River Irrigation System (UPRIS) of the National Irrigation Authority provides irrigation to lowland rice farms in Southern Bukidnon. As a predominantly farming community, agriculture is beset with problems on excessive use of chemical fertilizer and pesticides, lack of technical know-how on farm and forest resource management, low livestock production, lack of post-harvest facilities, conversion of agricultural land into industrial plantation, destruction of the watershed and loss of biodiversity. According to the Barangay Development Plan, its local organizations lack information on governance and financial management. Moreover, Barangay Kiharong envisions becoming the northern frontier for sustainable agricultural production and water resource development in the municipality of Maramag. Its economic goal is to increase productivity, generate investment and employment opportunities for its people. The project will build on the four major components namely organization and partnership building, capacity building and livelihood development, community enterprise development plan, and social impact assessment. The capacity building activities will focus on the social preparation of the community beneficiaries for the S&T livelihood enterprise that they will pursue as well as partnership building and towards self-reliance.	1 MOA signed with government agency/NGO partner 1 PO registered at DOLE 2 new capability building activities to at least 30 farmers 1 Techno Field Day conducted 2 new commodities produced and marketed Farmer“s income increased by at least 10-20% 1 Enabling and/or support policy identified and recommended 1 LGU resolution/ordinance formulated 1 Terminal Report submitted 1 publishable paper submitted	CMU	The target beneficiaries of the project are the AANR households in upland Brgy. Kiharong who are below poverty and food threshold levels.	1-Jan-19	31-Mar-22	ONGOING	6,941,722	2,070,956
S&T Community Based Program for Inclusive Development (STC4ID)	Project 3. S&T Community-Based Project for Inclusive Development (STC4ID) for the Upland Farmers in Salangsang, Lebak, Sultan Kudarat (Old Title: Enhancing Vegetable Production thru S&T Community-based Organic Farming Interventions for Marginalized Upland Farmers)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	As mentioned by the Asia Development Bank (ADB), Indigenous Peoples (IPs) are often found to lack access to assets and opportunities required for them to participate in mainstream development, on account of social exclusion, as well as the lack of adequate access to health and education services, that can enable them to participate in informed and effective ways. Considerable efforts are made by the Philippine government and civil society to bring the IPs into the mainstream development process, while fully respecting their culture and tradition, as well as their rights. IPs remain among the poorest groups in the country, reason why they require special support (https://www.adb.org/sites/default/files/project-document/65345/37749-phiipdf.pd). The STC4ID program development, an innovative technology program under the HNRDS, is a demonstration of technology transfer modality in multi-locations that focuses on Geographically, Economically, and Socially Disadvantaged communities and social groups in the AANR-based S&T community livelihoods. The STC4ID therefore is a timely mechanism that can provide opportunity among the farmers, specifically those settled in Barangay Salansang, by providing project inputs such as improved farming practices/technologies, individual and organizational strengthening, agricultural facilities and skills development to effect change the agricultural landscape in the area. It is envisioned that in 1-3 years from now, the community can initially focus on addressing their basic food requirements and income needs through the adoption of production technology options for vegetables. For the midterm, 3-5 years from now, the community can pursue and expand production and marketing of quality vegetables to improve their livelihood opportunities and have their income increased to at least 60 to 100% of food threshold and toward poverty threshold; and for the long-term, 5-8 years from now, when the community has expanded to nearby barangays, the organization can start planning for the Agri/ecotourism business ventures, and institutional market arrangements with the local malls in Cotabato City, Isulan, and Tacurong City, and they will. On the other hand, the recorded total population is of Barangay Salansang is 5,564 from 1,243 households where Manobo (40%), Teduray (30%) and Ilonggo (20.99) dominate the place. Lebak as one of the 1st class municipalities of Sultan Kudarat is not exempted from the poverty situation where it ranked No. 8 with the incidence of 51.3% among the twelve (12) municipalities of the province. The food threshold of SK is PHP 7,140.00. Based on the record of the barangay, the average income of families is Php 1,500.00; this income is very far from the province“s food threshold level. This indicates that there is food insecurity experienced in the place, the reason why social interventions and development initiatives could be proposed in the area.	- Sustained linkage with LGU and other partners - Increased number of market linkages to 4 - Increased the land area for vegetable production by 10% - Increased number of stakeholders trained to 20% - At least 2 Value-added products are commercial	SKSU	The target beneficiaries of the project are the farmer-cooperators themselves, academe, research and extension institutions, vegetable growers, LGUs, and food processors.	1-Jan-19	31-Dec-21	ONGOING	6,783,635	2,155,264
S&T Community Based Program for Inclusive Development (STC4ID)	Project 4. S&T Community-Based Project for Inclusive Development (STC4ID) For Selected Internally Displaced Persones (IDPs) and Farmers in Jolo, Sulu (Old Title: Science and Technology Community-based Project for Inclusive Development in Barangay San Raymundo, Jolo, Sulu)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Thus, the STC4ID program development, an innovative technology program under the HNRDS, is the demonstration of technology transfer modality in multi-locations that focuses on Geographically, Economically, and/or Socially Disadvantaged (GESDA) communities and social groups in the AANR sector. The program offers to serve the poor and priority disadvantaged communities across the Philippines by leading them to establish sustainable and resilient AANR-based S&T community livelihoods. In particular, it would like to give (wider) primary priority to any or a combination of the following: a) Poverty-stricken areas (based on PSA data, 20 poorest provinces); b) Indigenous people; c) Conflict-vulnerable communities (includes conflict-affected or victims of conflict); d) Coastal or fishing communities; e) Upland farm communities; f) Isolated AANR communities. Cassava has a strong economic relationship with resource constrained farmers situated in marginal land of the area. This means that the development of cassava industry in this part of Mindanao and understanding of its unrealized ability is to provide something to the improvement of living conditions of communities. Specifically, in the province, cassava is widely considered as their staple food. Thus, it is very vital to bring a system that sufficiently meets the requirements of high yielding cultivars of cassava in the area. This will make possible the supply of tubers and its intermediate products such as feeds and traditional food of rural people in the province	3 MOAs 1 Market agreement 2 capacity building (faci) 3 capacity building (farmers) 1 techno field visit 3 technology trainings 1 demo farm 1 initial livelihood program 1 techno field day 2 high yielding cassava production 3 cassava produced and marketed achieved 100% food threshold (Y3) 1 policy advocacy plan developed 1 LGU resolution 1 community baseline documeneted 2 IEC materials produced 1 publishable paper 1 terminal report	MSU-Sulu	Cassava farmers and IDPs who came from the Municipality of Indanan, Patikul, Parang, Talipao, Maimbung, and Luuk Sulu who are now living in San Raymundo, Jolo, Sulu	1-Jan-19	31-Dec-21	ONGOING	5,938,012	1,756,004
S&T Community Based Program for Inclusive Development (STC4ID)	Project 5. S&T Community-Based Project for Inclusive Development (STC4ID) For Selected Farmers and Fishermen in Enrique Villanueva, Siquijor (Old Title: Agri-Fishery Program Initiatives for Livelihood Enhancement Services (Agri-Fishery PILES) in Selected Communities in the Six Municipalities of Siquijor Province)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The creation of 2017-2022 Harmonized National Research and Development (HNRD) by the Department of Science and Technology was aimed at achieving the three of President Rodrigo Duterte“s 10- point socioeconomic agenda: promoting science, technology and the creative arts to enhance innovation and creativity toward self-sustaining and inclusive development; Improving social protection programs&#; in order to protect the poor against instability and economic shocks; Promoting rural and value chain development toward increasing agricultural and rural enterprise productivity and tourism. The STC4ID program development, is a demonstration of technology transfer modality in multi-locations that focuses on Geographically, Economically, and/or Socially Disadvantaged (GESDA) communities and social groups in the AANR sector, is an innovative technology program under the HNRDS. It is a program offered to serve the priority poor and disadvantaged communities all over the country by leading them to establish and develop sustainable and resilient AANR-based S&T community livelihood. Siquijor Province is included in the 10 marginal provinces in the Philippines. According to 2016 reports of the Philippine Statistics Authority (PSA), Siquijor has 55.2% poverty incidence. Enrique Villanueva is one of the six municipalities located in the northern most of Siquijor Island. It has a total land area of 28.60 square kilometers and is considered the smallest municipality of the island of Siquijor. The town is composed of 14 barangays and has a total of 6,104 people in the 2015 census. Bitaug, the target partner, is one of the 14 rural barangays in the Municipality of Enrique Villanueva situated along the shoreline and partly hilly land. It has a total land area of 177.9263 hectares with a population of 887 representing 14.53% of the total population of Enrique Villanueva and 269 number of households. According to CBMS Poverty Maps of 2006, 135 households in Barangay Bitaug had an income below the poverty threshold and 123 households below the food threshold. Farming and fishing are their main sources of living where harvest is very low. The project will build on the four major components namely organization and partnership building, capacity building and livelihood development, community enterprise development plan, and social impact assessment. The capacity building activities will focus on the social preparation of the community beneficiaries for the S&T livelihood enterprise that they will pursue as well as partnership building and towards self-reliance.	1 MOA/MOU signed with new gov“t agency or NGO-partner market agreement signed I At least 2 more capacity building activities for 30 farmers conducted I 2 Technology Field Day conducted I More commodities produced and marketed I Farmers Income increased to meet at least 75% of food threshold I 1 policy advocacy plan developed; I 1 LGU resolution/ordinance formulated 1 publishable paper submitted	Siquijor State College	AANR Households from Barangay Bitaug, Enrique Villanueva, Siquijor	1-Jan-19	31-Dec-21	ONGOING	5,593,920	1,694,500
S&T Community Based Program for Inclusive Development (STC4ID)	Project 6. S&T Community-Based Project for Inclusive Development (STC4ID) For Selected Farmers and Fishermen in Magallanes, Sorsogon (Old Title: Technology Roll-out, Extension and Deployment - S&T Community-based Project for Inclusive Development (ST4ID) in Biga, Magallanes, Sorsogon)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The 2017-2022 Harmonized National Research and Development Agenda (HNRDA) was recently created by the Department of Science and Technology to directly address three of President Rodrigo Duterte“s 10-point socioeconomic agenda: promotion of rural and value chain development towards increasing agricultural and rural enterprise productivity and rural tourism; promotion of science and technology and creative arts to enhance innovation and creative capacity towards self-sustaining, inclusive development; and improve social protection programs&#; to protect the poor against instability and economic shock. The 2017-2022 HNRDA ensures that the studies and researches will be beneficial to the stakeholders through the &#;development of innovative and improvement of traditional extension modalities for the efficient transfer of technologies to end-users&#. Thus, the ST4ID program development, an innovative technology program under the HNRDS, is the demonstration of technology transfer modality in multi-locations that focuses on Geographically, Economically, and/or Socially Disadvantaged (GESDA) communities and social groups in the AANR sector. The program offers to serve the poor and priority disadvantaged communities across the Philippines by leading them to establish sustainable and resilient AANR-based S&T community livelihoods. The ST4ID will be implemented in Magallanes, Sorsogon. The Province of Sorsogon is included in the ten 10 marginal provinces in the Philippines. According to 2015 reports of the Philippine Statistics Authority (PSA), Sorsogon has 31.65% poverty incidence. Poverty threshold per capita in Sorsogon is at P10,483 while food threshold per capita is at P7,320 (PSA, 2015). The municipality of Magallanes has a higher poverty incidence than the provincial rate at 44.1%. It is one of the six priority municipalities under Department of Agriculture“s top post to alleviate poverty and achieve food security, Special Area for Agricultural Development (SAAD). Biga is one of the 24 rural barangays in the Municipality of Magallanes, Sorsogon. The barangay has high poverty threshold of 94.35% (Barangay Profile of Biga). There are 139 beneficiaries of the national government“s Pantawid Pamilyang Pilipino Program (4Ps). Access to social services such as education, health, water and sanitation is also a problem. Only 136 households have sanitary toilet facilities. The dominant livelihood activities in the barangay are marine and inland fishing, with sardines and blue swimming crab (Portunus pelagicus) as the main commodities. This livelihood, however, is seasonal and highly vulnerable to the strong sea current due to the Bagatao Island“s location (intersecting waters from Sorsogon Bay and the Sibuyan Sea). Fishing activities are also limited during the onset of the Southwest monsoon and typhoons (considered as lean season). The average income from fishing during peak or regular fishing season is P200-P250 per day. However, during lean season, average income falls to only P2,500 per month. The income falls short of the food threshold per capita and poverty threshold per capita of Sorsogon. During lean season, residents resort to pole fishing to provide for the family“s food needs. To augment income, fishermen engage in informal jobs such as construction work. Some residents are also engaged in subsistence farming, with rice, corn, and coconut as the most common crops. However, production is very low. Previous development interventions by government agencies (dispersal of pigs and goats for livelihood) were also not	o At least 2 MOA/MOU signed with new govt agency- or NGOpartner o At least 2 market agreement signed o At least 2 capacity building activities for 3%#30 F/F-cooperators conducted o 1 Techno Field Day conducted o F/F“ income increased to at least 60-100% of food threshold o 1 commodity produced with valueaddition initiated o 1 CESP developed; o 1 policy advocacy plan developed; o 4%#1 LGU resol“n/ordinance formulated o 1 Terminal Report submitted o 1 publishable paper submitted	Sorsogon State College	AANR households from Barangay Biga, Magallanes, Sorsogon (Community partner: Biga Farmers and Fishermen Association)	1-Jan-19	31-Mar-22	ONGOING	6,986,287	2,140,841

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 1. SUSTAIN IP-TBM Program Coordination, Capacity Building, and IP Policy Development and Assessment(Old Title: Support to University Strategy in Technology Acceleration Initiatives by Nurturing (SUSTAIN) Intellectual Property and Technology Business Management (IP-TBM) Office)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The Philippines marked its first innovation achiever position in the 2019 Global Innovation Index, posting a big jump to 54th place from the previous year's 73rd position as it catches up with world leaders (www.pna.gov.ph). With a total score of 38.18 over 100, the report said the Philippines is among the countries that have "above expectations for level of development" among lower-middle-income economies. The report said governments around the globe had increased the use of intellectual property in their quest for innovation, with investments on R&D growing more than double between 1996 and 2016. It said R&D expenditures of governments around the world rose by 5 percent while business R&D expenditures went up by 6.7 percent, the most significant jump since 2011. According to the EU Patent Office, patents are essential signals of innovation as statistics reveal that 70% of technology disclosed in patent literature was not disclosed in any non-patent literature; 80% of unique information in patent literature is not published elsewhere and $60BN wasted for developing things that are already documented in a patent specification. Intellectual property represents the principal value component of many global trade transactions (Exell and Cory 2019, Information Technology and Innovation Foundation (ITIF)). Global cross-border exports of commercial knowledge- and technology-intensive goods and services reached an estimated $4 trillion in 2014, consisting of $1.6 trillion of commercial knowledge-intensive services and $2.4 trillion of exports of high-tech products. In fact, knowledge"rather than labor, capital, or resource-intensive components" represents about one-half of current global trade l›,ows, and this knowledge-intensive component is growing faster, at about 1.3 times the rate of labor-intensive l›,ows. This is partly due to the rise of knowledge-intensive business services" such as computer-related services (e.g., software and information processing), research and development (R&D) services, and business services (e.g., legal, accounting, and advertising)" which provide critical intermediate inputs into other economic activity. Research estimates that while services account for just 20 percent of gross exports worldwide, they share more than doubles to 41 percent when considering value-added exports. MalacaÑang also welcomed the results of the latest GII report, saying in a statement that it commends the departments and agencies (e.g., Department of Science and Technology (DOST) and Department of Trade and Industry (DTI)) that helped achieve the improvement in the country's global rank. The DOST is one of the identified "start-up enablers" in the Innovative Startup Act and is intent on providing proper support. The recently signed "innovative Startup Act" will give us the mechanism to further improve our support to new businesses with brilliant ideas and fast-track innovation and trade in country. The use of innovative technologies or intellectual properties is one of the primary components of a start-up. Hence, sustaining our initiatives on	Conducted at least 30 monitoring and evaluation visits Conducted the modules 4-10 of the DOST-PCAARRD IP Master Class and Technology Commercialization Mentorship Series At least 25 IP-TBM staff extensively trained under the IP Master Class and Technology Commercialization Mentorship Series (modules 4-10) Conducted at least 2 exploratory meetings with Business Groups/Marketing or Trade Institutions Conducted 2 technology pitch days Conducted at least 5 policy reviews Conducted 1 commitment meeting	CvSU	Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs/RDIs Technology transfer officers/managers SUC/RDI Researchers/Inventors Technology takers	1-Jan-20	30-Jun-22	ONGOING	11,370,297	1,704,055
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 2. Sustaining Mariano Marcos State University's (MMSU) IP-TBM Office and Enhancing IP-TBM Offices among Member Agencies of the Ilocos Agriculture and Resources Research and Development Consortium (ILARRDEC)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	There are about 111 SUCs in the Philippines, and six of which are in the Ilocos Region. Despite these numbers, still the Philippines ranked 73rd in the 2018 Global Innovation Index (GII) out of 126 economies and ranked 9th among the 30 lower-middle-income countries included in the index and placed 13th among 15 below average-income countries in Southeast Asia and Oceania (Tubayan 2018). In terms of R&D, public HEIs contributed almost 43% in total, on average to agricultural R&D. Overall, in the government, HEIs and private non-profit sectors, the top socio-economic objective of R&D was for agricultural production and technology with 23% of total expenditures (Catiboig, 2016). The Philippine government spent on agricultural R&D remained low at about 0.13% of gross value added (GVA) in agriculture from 2003-2011 (Ravago and Balisacan, 2016). As early as 2008, CHED and IPOPHL already inked a memorandum of understanding to strengthen collaboration on IP protection and technology transfer in HEIs (Yadao-Sison, 2010). This was cascaded to the SUCs by CHED through Joint Circulars 08-01 and 08-02, mandating attendance to participant HEIs to the National Conference on IP on May 21-22, 2008 and directing all public and private HEIs to develop their respective policy guidelines on IP with the assistance of IPOPHL on July 31, 2018, respectively. The role of HEIs in developing inventrepreneurs towards sustainable development cannot be denied. Through Circular Memorandum Order (CMO) No. 46, s 2012 which is the policy-standard to enhance quality assurance (QA) in the Philippine Higher Education through an Outcomes-based and Typology QA-" mandating HEIs to contribute to building quality nation capable of transcending the social, political, economic, cultural and ethical issues that constrain the country's human development, productivity and global competitiveness (Ancheta 2018). Specifically, HEIs must provide focused support to the research required for technological innovation, economic growth and global competitiveness for the improvement of human life of Filipinos. This program was strengthened through the CMO No. 52, s. 2016 " Pathway to equity, relevance and advancement in research, innovation and extension in Philippine Higher Education by providing a) platforms of knowledge production and advancement, b) engines of development through responsive and relevant research programs, and c) producers of multi-specialist, creators, problem-solvers, collaborators, inventors, thinkers, and innovators who can examine phenomena, explore new frontiers, and bring from multidisciplinary and interdisciplinary lenses. The main research agenda of CHED as shown in the National Higher Education Research Agenda include: improving research capability of HEIs towards international competitiveness; enhance research productivity of HEIs in distinctive areas of competence; general knowledge/technologies needed for international, national and regional higher education development, policy/plan formulation, developing innovative programs and advancing the frontiers of knowledge in the disciplines; and promote and facilitate dissemination and utilization of research outputs. The revised FY 2016 SUC Levelling Instrument which was formulated jointly by the Department of Budget and Management (DBM) and CHED in coordination with the Philippine Association of State Universities and Colleges (PASUC) to measure the outputs of the HEIs. It seeks to allow the categorization of the- different types of institutions from Level I to Level V with the latter as the highest in terms of institutional performance indexed to the four (4) key result areas: quality and relevance of instruction; research	1 updated inventory of IP Asset 1 Technology Commercialization Plan 40 PAS reports of R&D proposals and IP applications At least 2 Technologies (products, processes, and systems) Commercialized 1 Regional Sustainability Plan	MMSU	Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs/RDIs Technology transfer officers/managers SUC/RDI Researchers/Inventors Technology takers	1-Jan-20	30-Jun-22	ONGOING	4,128,594	1,525,608
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 2A. Enhancing Technology Transfer through IP-TBM in Don Mariano Marcos Memorial State University (DMMMSU) (Old Title: Strengthening and Sustaining Intellectual Property and Technology Business Management (IP-TBM) of Don Mariano Marcos Memorial State University (DMMMSU))	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The IP-TBM project will enhance/complement the DMMMSU through PCAARD-DPITC's assistance by: capacitating its personnel in handling/facilitating technology promotion and commercialization activities; and establishing linkages among MMSU's technology owners/generators with investors, end users, and other stakeholders. The IP-TBM's intensive training will enhance project members' (manager, technology transfer officers, science research assistant, administrative assistant) capacity to: evaluate and package technology for commercialization; come up with a market research; design and present business proposals among end-users, industry companies and investors; design IEC and communication campaign as promotional strategies.	Year 1: "At least 1 inventory of IP assets "At least 1 IP-TBM staff extensively trained under the IP Master Class and Technology Commercialization Mentorship Series "At least 1 IP-TBM staff attended a local IP workshop/fora "At least 1 promotional IECs for SUC/RDI technologies "At least 2 IP (patent and utility model only) applications "1 IP-TBM established/enhanced "1 Institutional IP Policy reviewed/ crafted Year 2: "At least 1 Technology Commercialized "At least 1 IP-TBM staff attended a foreign IP workshop/fora "At least 20 SUC/RDI trained (short duration/echo seminar) on IP Management and Technology Commercialization with IP-TBM staff as trainer/speaker "At least 2 networking events and technology promotion conducted by the SUC/RDI "At least 1 promotional IECs for SUC/RDI technologies "At least 3 IP (patent and utility model only) applications "1 IP-TBM institutionalized	DMMMSU	(DA-RFO 1)-Faculty members and Full-time Researchers and Inventor	1-Jan-20	30-Jun-22	ONGOING	1,631,716	614,513
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 2B. Enhancing Technology Transfer through IP-TBM in Ilocos Sur Polytechnic State College (ISPSC) (Old Title: Strengthening and Sustaining Intellectual Property and Technology Business Management (IP-TBM) of Ilocos Sur Polytechnic State College (ISPSC))	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The IP-TBM project will enhance/complement the ISPSC's CIPO through PCAARD-DPITC's assistance by: capacitating its personnel in handling/facilitating technology promotion and commercialization activities; and establishing linkages among MMSU's technology owners/generators with investors, end users, and other stakeholders. The IP-TBM's intensive training will enhance project members' (manager, technology transfer officers, science research assistant, administrative assistant) capacity to: evaluate and package technology for commercialization; come up with a market research; design and present business proposals among end-users, industry companies and investors; design IEC and communication campaign as promotional strategies.	Year 1: "At least 1 inventory of IP assets "At least 1 IP-TBM staff extensively trained under the IP Master Class and Technology Commercialization Mentorship Series "At least 1 IP-TBM staff attended a local IP workshop/fora "At least 1 promotional IECs for SUC/RDI technologies "At least 2 IP (patent and utility model only) applications "1 IP-TBM established/enhanced "1 Institutional IP Policy reviewed/ crafted Year 2: "At least 1 Technology Commercialized "At least 1 IP-TBM staff attended a foreign IP workshop/for a "At least 20 SUC/RDI trained (short duration/echo seminar) on IP Management and Technology Commercialization with IP-TBM staff as trainer/speaker "At least 2 networking events and technology promotion conducted by the SUC/RDI "At least 1 promotional IECs for SUC/RDI technologies "At least 3 IP (patent and utility model only) applications "1 IP-TBM institutionalized	ISPSC	ISPSC Faculty and Full-time Researchers and Inventor	1-Jan-20	30-Jun-22	ONGOING	1,631,716	642,537
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 2C. Enhancing Technology Transfer through IP-TBM in North Luzo Philippines State College (NLPSC)(Old Title: Strengthening and Sustaining Intellectual Property and Technology Business Management (IP-TBM) of North Luzon Philippines State College (NLPSC))	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The IP-TBM project will enhance/complement the NLPSC's IPO through PCAARD-DPITC's assistance by capacitating its personnel in handling/facilitating technology promotion and commercialization activities; and establishing linkages among NLPSC's technology owners/generators with investors, end-users, and other stakeholders. The IP-TBM's intensive training will enhance project members' (manager, technology transfer officers, science research assistant, administrative assistant) capacity to: evaluate and package technology for commercialization; come up with market research; design and present business proposals among end-users, industry companies, and investors; design IEC and communication campaign as promotional strategies.	Year 1: "At least 1 inventory of the potential research outputs for patent "At least 1 IP-TBM staff extensively trained under the IP Master Class and Technology Commercialization Mentorship Series "At least 1 IP-TBM staff attended a local IP workshop/fora "At least 1 promotional IECs for SUC/RDI technologies "1 IP-TBM established/enhanced "1 Institutional IP Policy reviewed/ crafted Year 2: "At least 1 Technology Commercialized "At least 1 IP-TBM staff attended a foreign IP workshop/for a "At least 10 SUC/RDI trained (short duration/echo seminar) on IP Management and Technology Commercialization with IP-TBM staff as trainer/speaker "At least 2 networking events and technology promotion conducted by the SUC/RDI "At least 1 promotional IECs for SUC/RDI technologies "At least 1 IP (patent and utility model) applications "1 IP-TBM institutionalized	NLPSC	North Luzon Philippines State College's Faculty Full-time Researchers and Inventor Potential target technology adopters	1-Jan-20	30-Jun-22	ONGOING	1,631,716	682,742

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 2D. Enhancing Technology Transfer through IP-TBM in Pangasinan State University (PSU)(Old Title: Strengthening and Sustaining Intellectual Property and Technology Business Management (IP-TBM) of Pangasinan State University (PSU))	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The IP-TBM project will enhance/complement the PSU-IPRU through PCAARD-DPITC's assistance by: capacitating its personnel in handling/facilitating technology promotion and commercialization activities; and establishing linkages among MMSU's technology owners/generators with investors, end users, and other stakeholders. The IP-TBM's intensive training will enhance project members' (manager, technology transfer officers, science research assistant, administrative assistant) capacity to: evaluate and package technology for commercialization; come up with a market research; design and present business proposals among end-users, industry companies and investors; design IEC and communication campaign as promotional strategies.	Year 1: Ã¢Â€Â¢ least 1 inventory of IP assets Ã¢Â€Â¢ least 1 IP-TBM staff extensively trained under the IP Master Class and Technology Commercialization Mentorship Series Ã¢Â€Â¢ least 1 IP-TBM staff attended a local IP workshop/fora Ã¢Â€Â¢ least 1 promotional IECs for SUC/RDI technologies Ã¢Â€Â¢ least 2 IP (patent and utility model only) applications Ã¢Â€Â¢ IP-TBM established/enhanced Ã¢Â€Â¢ Institutional IP Policy reviewed/ crafted Year 2: Ã¢Â€Â¢ least 1 Technology Commercialized Ã¢Â€Â¢ least 1 IP-TBM staff attended a foreign IP workshop/fora Ã¢Â€Â¢ least 20 SUC/RDI trained (short duration/echo seminar) on IP Management and Technology Commercialization with IP-TBM staff as trainer/speaker Ã¢Â€Â¢ least 2 networking events and technology promotion conducted by the SUC/RDI Ã¢Â€Â¢ least 1 promotional IECs for SUC/RDI technologies Ã¢Â€Â¢ least 3 IP (patent and utility model only) applications Ã¢Â€Â¢ IP-TBM institutionalized	PSU	PSU-Faculty members and Full-time Researchers and Inventor	1-Jan-20	30-Jun-22	ONGOING	1,631,716	691,255
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 2E. Enhancing Technology Transfer through IP-TBM in University of Northern Philippines (UNP)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The IP-TBM project will enhance/complement the UNP through PCAARD-DPITC's assistance by: capacitating its personnel in handling/facilitating technology promotion and commercialization activities; and establishing linkages among MMSU's technology owners/generators with investors, end users, and other stakeholders. The IP-TBM's intensive training will enhance project members' (manager, technology transfer officers, science research assistant, administrative assistant) capacity to: evaluate and package technology for commercialization; come up with a market research; design and present business proposals among end-users, industry companies and investors; design IEC and communication campaign as promotional strategies. This institution provides advanced instructions in the arts, agriculture, fishery, engineering and natural sciences, as well as in other technological and professional fields; promote research and engage in extension work.	Products Ã¢Â€Â¢ inventory of IP assets Ã¢Â€Â¢ 1 Technology (products, processes, and systems) commercialized Ã¢Â€Â¢ PAS reports People and Services Ã¢Â€Â¢ least 1 IP-TBM staff extensively trained under the IP Master Class and Technology Commercialization Mentorship Series Ã¢Â€Â¢ least 20 SUC Staff trained (short duration/echo seminar) on IP Management and Technology Commercialization with IP-TBM-Mentee staff as trainer/speaker Ã¢Â€Â¢ least 2 exploratory meetings/networking events and technology promotion activities conducted by the SUC Ã¢Â€Â¢ least 1 technology takers/adopters Publications Ã¢Â€Â¢ least 2 promotional IECs for SUC technologies Patents Ã¢Â€Â¢ least 5 IP (patent and UM) applications Places and Partnerships Ã¢Â€Â¢ IP-TBM established/enhanced/institutionalized Ã¢Â€Â¢ Letter of Commitment from SUC Ã¢Â€Â¢ least 1 commercialization agreements executed Ã¢Â€Â¢ least 1 partnership agreements with the Philippine Chamber of Commerce Inc./Business Groups/Marketing or Trade Institutions Policies Ã¢Â€Â¢ Institutional IP Policy reviewed/crafted/presented to approving bodies	UNP	UNP-Faculty members and Full-time Researchers and Inventor	1-Jan-20	30-Jun-22	ONGOING	1,631,716	494,468
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 3. Sustaining CvSU's IP-TBM Office and Enhancing IP-TBM Offices Among Member Agencies of the Southern Tagalog Agriculture and Resources Research and Development Consortium (STARRDEC)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The Philippines marked its first innovation achiever position in the 2019 Global Innovation Index, posting a big jump to 54th place from the previous year's 73rd position as it catches up with world leaders (www.pna.gov.ph). With a total score of 38.18 over 100, the report said the Philippines is among the countries that have Ã¢Â€Â¢above expectations for level of development Ã¢Â€Â¢ among lower-middle-income economies. The report said governments around the globe had increased the use of intellectual property in their quest for innovation, with investments on R&D growing more than double between 1996 and 2016. It said R&D expenditures of governments around the world rose by 5 percent while business R&D expenditures went up by 6.7 percent, the most significant jump since 2011. According to the EU Patent Office, patents are essential signals of innovation as statistics reveal that 70% of technology disclosed in patent literature was not disclosed in any non-patent literature; 80% of unique information in patent literature is not published elsewhere and $60BN wasted for developing things that are already documented in a patent specification. Intellectual property represents the principal value component of many global trade transactions (Ezell and Cory 2019, Information Technology and Innovation Foundation (ITIF)). Global cross-border exports of commercial knowledge- and technology-intensive goods and services reached an estimated $4 trillion in 2014, consisting of $1.6 trillion of commercial knowledge-intensive services and $2.4 trillion of exports of high-tech products. In fact, knowledge's rather than labor, capital, or resource-intensive components's represents about one-half of current global trade i-,ows, and this knowledge-intensive component is growing faster, at about 1.3 times the rate of labor-intensive i-,ows. This is partly due to the rise of knowledge-intensive business services's such as computer-related services (e.g., software and information processing), research and development (R&D) services, and business services (e.g., legal, accounting, and advertising)'which provide critical intermediate inputs into other economic activity. Research estimates that while services account for just 20 percent of gross exports worldwide, they share more than doubles to 41 percent when considering value-added exports. MalacaÃ±ang also welcomed the results of the latest GII report, saying in a statement that it commends the departments and agencies (e.g., Department of Science and Technology (DOST) and Department of Trade and Industry (DTI)) that helped achieve the improvement in the country's global rank. The DOST is one of the identified Ã¢startup enablers's in the Innovative Startup Act and is intent on providing proper support. The recently signed Ã¢Innovative Startup ActÃ¢ will give us the mechanism to further improve our support to new businesses with brilliant ideas and fast-track innovation and trade in country. The use of innovative technologies or intellectual properties is one of the primary components of a start-up. Hence, sustaining our initiatives on	Conducted at least 30 monitoring and evaluation visits Conducted the modules 4-10 of the DOST-PCAARRD IP Master Class and Technology Commercialization Mentorship Series At least 25 IP-TBM staff extensively trained under the IP Master Class and Technology Commercialization Mentorship Series (modules 4-10) Conducted at least 2 exploratory meetings with Business Groups/Marketing or Trade Institutions Conducted 2 technology pitch days Conducted at least 5 policy reviews Conducted 1 commitment meeting At least 8 promotional IECs IP Policy template Technology Transfer Protocol template	CvSU	Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs/RDIs Technology transfer officers/managers SUC/RDI Researchers/Inventors Technology takers	1-Jan-20	30-Jun-22	ONGOING	2,123,011	716,721
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 3A. Enhancing Technology Transfer through IP-TBM in Southern Luzon State University (SLSU)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The Philippines marked its first innovation achiever position in the 2019 Global Innovation Index, posting a big jump to 54th place from the previous year's 73rd position as it catches up with world leaders (www.pna.gov.ph). With a total score of 38.18 over 100, the report said the Philippines is among the countries that have Ã¢Â€Â¢above expectations for level of development Ã¢Â€Â¢ among lower-middle-income economies. The report said governments around the globe had increased the use of intellectual property in their quest for innovation, with investments on R&D growing more than double between 1996 and 2016. It said R&D expenditures of governments around the world rose by 5 percent while business R&D expenditures went up by 6.7 percent, the most significant jump since 2011. According to the EU Patent Office, patents are essential signals of innovation as statistics reveal that 70% of technology disclosed in patent literature was not disclosed in any non-patent literature; 80% of unique information in patent literature is not published elsewhere and $60BN wasted for developing things that are already documented in a patent specification. Intellectual property represents the principal value component of many global trade transactions (Ezell and Cory 2019, Information Technology and Innovation Foundation (ITIF)). Global cross-border exports of commercial knowledge- and technology-intensive goods and services reached an estimated $4 trillion in 2014, consisting of $1.6 trillion of commercial knowledge-intensive services and $2.4 trillion of exports of high-tech products. In fact, knowledge's rather than labor, capital, or resource-intensive components's represents about one-half of current global trade i-,ows, and this knowledge-intensive component is growing faster, at about 1.3 times the rate of labor-intensive i-,ows. This is partly due to the rise of knowledge-intensive business services's such as computer-related services (e.g., software and information processing), research and development (R&D) services, and business services (e.g., legal, accounting, and advertising)'which provide critical intermediate inputs into other economic activity. Research estimates that while services account for just 20 percent of gross exports worldwide, they share more than doubles to 41 percent when considering value-added exports. MalacaÃ±ang also welcomed the results of the latest GII report, saying in a statement that it commends the departments and agencies (e.g., Department of Science and Technology (DOST) and Department of Trade and Industry (DTI)) that helped achieve the improvement in the country's global rank. The DOST is one of the identified Ã¢startup enablers's in the Innovative Startup Act and is intent on providing proper support. The recently signed Ã¢Innovative Startup ActÃ¢ will give us the mechanism to further improve our support to new businesses with brilliant ideas and fast-track innovation and trade in country. The use of innovative technologies or intellectual properties is one of the primary components of a start-up. Hence, sustaining our initiatives on	Conducted at least 30 monitoring and evaluation visits Conducted the modules 4-10 of the DOST-PCAARRD IP Master Class and Technology Commercialization Mentorship Series At least 25 IP-TBM staff extensively trained under the IP Master Class and Technology Commercialization Mentorship Series (modules 4-10) Conducted at least 2 exploratory meetings with Business Groups/Marketing or Trade Institutions Conducted 2 technology pitch days Conducted at least 5 policy reviews Conducted 1 commitment meeting At least 8 promotional IECs IP Policy template Technology Transfer Protocol template	SLSU	Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs/RDIs Technology transfer officers/managers SUC/RDI Researchers/Inventors Technology takers	1-Jan-20	30-Jun-22	ONGOING	1,631,716	676,825
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 3B. Enhancing Technology Transfer through IP-TBM in University of Rizal System (URS)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	By virtue of RA 10055 DOST-PCAARRD has effectively acquired an additional mandate for technology transfer. As a Government Funding Agency (GFA), PCAARRD is mandated to provide assistance to various Research and Development Institutes (RDIs) and State Universities and Colleges (SUCs) in protecting and managing intellectual properties, including commercialization. As part of this initiative, PCAARRD launched the DOST-PCAARRD Innovation and Technology Center (DPITC) last March 2016. This IP-TBM Program aims to strengthen the capacities of Intellectual Property and Technology Business Management of selected SUCs and RDIs to enhance their technology commercialization activities. IP-TBMs are technology transfer offices in the target agencies that mirror the initiatives of the DPITC.	Products Ã¢Â€Â¢ inventory of IP assets Ã¢Â€Â¢ 1 Technology (products, processes, and systems) commercialized Ã¢Â€Â¢ PAS reports People and Services Ã¢Â€Â¢ least 1 IP-TBM staff extensively trained under the IP Master Class and Technology Commercialization Mentorship Series Ã¢Â€Â¢ least 20 SUC Staff trained (short duration/echo seminar) on IP Management and Technology Commercialization with IP-TBM-Mentee staff as trainer/speaker Ã¢Â€Â¢ least 2 exploratory meetings/networking events and technology promotion activities conducted by the SUC Ã¢Â€Â¢ least 1 technology takers/adopters Publications Ã¢Â€Â¢ least 2 promotional IECs for SUC technologies Patents Ã¢Â€Â¢ least 5 IP (patent and UM) applications Places and Partnerships Ã¢Â€Â¢ IP-TBM established/enhanced/institutionalized Ã¢Â€Â¢ Letter of Commitment from SUC Ã¢Â€Â¢ least 1 commercialization agreements executed Ã¢Â€Â¢ least 1 partnership agreements with the Philippine Chamber of Commerce Inc./Business Groups/Marketing or Trade Institutions Policies Ã¢Â€Â¢ Institutional IP Policy reviewed/crafted/presented to approving bodies Ã¢Â€Â¢ Technology Transfer Protocol reviewed/crafted/ presented to approving bodies	URS	Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs Technology transfer officers/managers SUC Researchers/Inventors	1-Jan-20	30-Jun-22	ONGOING	1,631,716	698,613

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 3C. Enhancing Technology Transfer through IP-TBM in Marinduque State College (MSC)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	By virtue of RA 10055 DOST-PCAARRD has effectively acquired an additional mandate for technology transfer. As a Government Funding Agency (GFA), PCAARRD is mandated to provide assistance to various Research and Development Institutes (RDIs) and State Universities and Colleges (SUCs) in protecting and managing intellectual properties, including commercialization. As part of this initiative, PCAARRD launched the DOST-PCAARRD Innovation and Technology Center (DPITC) last March 2016. This IP-TBM Program aims to strengthen the capacities of Intellectual Property and Technology Business Management of selected SUCs and RDIs to enhance their technology commercialization activities. IP-TBMs are technology transfer offices in the target agencies that mirror the initiatives of the DPITC.	Products â€¢1 inventory of IP assets â€¢At 1 Technology (products, processes, and systems) commercialized â€¢5 PAS reports People and Services â€¢At least 1 IP-TBM staff extensively trained under the IP Master Class and Technology Commercialization Mentorship Series â€¢At least 20 SUC Staff trained (short duration/echo seminar) on IP Management and Technology Commercialization with IP-TBM-Mentee staff as trainer/speaker â€¢At least 2 exploratory meetings/networking events and technology promotion activities conducted by the SUC â€¢At least 1 technology takers/adopters Publications â€¢At least 2 promotional IECs for SUC technologies Patents â€¢At least 5 IP (patent and UM) applications Places and Partnerships â€¢1 IP-TBM established/enhanced/institutionalized â€¢1 Letter of Commitment from SUC â€¢At least 1 commercialization agreements executed â€¢At least 1 partnership agreements with the Philippine Chamber of Commerce Inc./Business Groups/Marketing or Trade Institutions Policies â€¢1 Institutional IP Policy reviewed/crafted/presented to approving bodies â€¢1 Technology Transfer Protocol reviewed/crafted/ presented to approving bodies	MSC	Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs Technology transfer officers/managers SUC Researchers/Inventors	1-Jan-20	30-Jun-22	ONGOING	1,631,716	646,381
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 3D. Enhancing Technology Transfer through IP-TBM in Batangas State University (BatSU)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	By virtue of RA 10055 DOST-PCAARRD has effectively acquired an additional mandate for technology transfer. As a Government Funding Agency (GFA), PCAARRD is mandated to provide assistance to various Research and Development Institutes (RDIs) and State Universities and Colleges (SUCs) in protecting and managing intellectual properties, including commercialization. As part of this initiative, PCAARRD launched the DOST-PCAARRD Innovation and Technology Center (DPITC) last March 2016. This IP-TBM Program aims to strengthen the capacities of Intellectual Property and Technology Business Management of selected SUCs and RDIs to enhance their technology commercialization activities. IP-TBMs are technology transfer offices in the target agencies that mirror the initiatives of the DPITC.	Products â€¢1 inventory of IP assets â€¢At 1 Technology (products, processes, and systems) commercialized â€¢5 PAS reports People and Services â€¢At least 1 IP-TBM staff extensively trained under the IP Master Class and Technology Commercialization Mentorship Series â€¢At least 20 SUC Staff trained (short duration/echo seminar) on IP Management and Technology Commercialization with IP-TBM-Mentee staff as trainer/speaker â€¢At least 2 exploratory meetings/networking events and technology promotion activities conducted by the SUC â€¢At least 1 technology takers/adopters Publications â€¢At least 2 promotional IECs for SUC technologies Patents â€¢At least 5 IP (patent and UM) applications Places and Partnerships â€¢1 IP-TBM established/enhanced/institutionalized â€¢1 Letter of Commitment from SUC â€¢At least 1 commercialization agreements executed â€¢At least 1 partnership agreements with the Philippine Chamber of Commerce Inc./Business Groups/Marketing or Trade Institutions Policies â€¢1 Institutional IP Policy reviewed/crafted/presented to approving bodies â€¢1 Technology Transfer Protocol reviewed/crafted/ presented to approving bodies	BatSU	Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs Technology transfer officers/managers SUC Researchers/Inventors	1-Jan-20	30-Jun-22	ONGOING	1,631,716	674,384
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 3E. Enhancing Technology Transfer through IP-TBM in Rizal Technological University (RTU)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	By virtue of RA 10055 DOST-PCAARRD has effectively acquired an additional mandate for technology transfer. As a Government Funding Agency (GFA), PCAARRD is mandated to provide assistance to various Research and Development Institutes (RDIs) and State Universities and Colleges (SUCs) in protecting and managing intellectual properties, including commercialization. As part of this initiative, PCAARRD launched the DOST-PCAARRD Innovation and Technology Center (DPITC) last March 2016. This IP-TBM Program aims to strengthen the capacities of Intellectual Property and Technology Business Management of selected SUCs and RDIs to enhance their technology commercialization activities. IP-TBMs are technology transfer offices in the target agencies that mirror the initiatives of the DPITC.	Products â€¢1 inventory of IP assets â€¢At 1 Technology (products, processes, and systems) commercialized â€¢5 PAS reports People and Services â€¢At least 1 IP-TBM staff extensively trained under the IP Master Class and Technology Commercialization Mentorship Series â€¢At least 20 SUC Staff trained (short duration/echo seminar) on IP Management and Technology Commercialization with IP-TBM-Mentee staff as trainer/speaker â€¢At least 2 exploratory meetings/networking events and technology promotion activities conducted by the SUC â€¢At least 1 technology takers/adopters Publications â€¢At least 2 promotional IECs for SUC technologies Patents â€¢At least 5 IP (patent and UM) applications Places and Partnerships â€¢1 IP-TBM established/enhanced/institutionalized â€¢1 Letter of Commitment from SUC â€¢At least 1 commercialization agreements executed â€¢At least 1 partnership agreements with the Philippine Chamber of Commerce Inc./Business Groups/Marketing or Trade Institutions Policies â€¢1 Institutional IP Policy reviewed/crafted/presented to approving bodies â€¢1 Technology Transfer Protocol reviewed/crafted/ presented to approving bodies	RTU	Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs Technology transfer officers/managers SUC Researchers/Inventors	1-Jan-20	30-Jun-22	ONGOING	1,631,716	682,282
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 4. Sustaining BU's IP-TBM Office and Enhancing IP-TBM Offices among Member Agencies of the Bicol Consortium for Agriculture, Aquatic and Natural Resources Research and Development (BCAARRD) (Old Title: Sustainability of the IP-TBM Operations of Bicol University and Establishment of IP-TBM Offices in SUCs/HEIs in Bicol Region)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The program shall deal with the challenges of sustainability of the IP-TBMâ€™s initial efforts in protecting and managing intellectual properties (IP) and pursuing technology commercialization. The program will implement a mentor-mentee-regional approach to further enhance the innovation ecosystem in the agriculture, aquatic and natural resources sectors. The program involves five mentor-agencies and 25 mentee-agencies across Regions I, IV, V, VI and XI. Mentoring, according to Zachary (2005, p3) is â€œa reciprocal and collaborative learning relationship between two (or more) individuals who share mutual responsibility and accountability for helping a mentee work towards achievement of clear and mutually defined career goals.â€ and thus is a good method for developing a talent pool within an organization and more ambitiously, a whole industry.	Expected output of the Mentor-Agency: - 1 updated inventory of IP Asset - 1 Technology Commercialization Plan - 40 PAS reports of R&D proposals and IP applications - At least 2 Technologies (products, processes, and systems) Commercialized - 1 Regional Sustainability Plan Expected output of the 5 Mentee-Agencies: - 25 inventories of IP assets - At least 25 Technologies Commercialized	BU	- Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs/RDIs - Technology transfer officers/managers - SUC/RDI Researchers/Inventors - Technology takers	1-Jan-20	30-Jun-22	ONGOING	3,413,274	1,168,382
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 4A. Enhancing Technology Transfer through IP-TBM in Camarines Norte State College (CNSC)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	By virtue of RA 10055 DOST-PCAARRD has effectively acquired an additional mandate for technology transfer. As a Government Funding Agency (GFA), PCAARRD is mandated to provide assistance to various Research and Development Institutes (RDIs) and State Universities and Colleges (SUCs) in protecting and managing intellectual properties, including commercialization. As part of this initiative, PCAARRD launched the DOST-PCAARRD Innovation and Technology Center (DPITC) last March 2016. This IP-TBM Program aims to strengthen the capacities of Intellectual Property and Technology Business Management of selected SUCs and RDIs to enhance their technology commercialization activities. IP-TBMs are technology transfer offices in the target agencies that mirror the initiatives of the DPITC.	Products - 1 inventory of IP assets - At 1 Technology (products, processes, and systems) commercialized - 5 PAS reports	CNSC	Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs Technology transfer officers/managers SUC Researchers/Inventors	1-Jan-20	31-Dec-21	ONGOING	1,631,716	675,082
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 4B: Enhancing Technology Transfer through IP-TBM in Camarines Sur Polytechnic College (CSPC)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	By virtue of RA 10055 DOST-PCAARRD has effectively acquired an additional mandate for technology transfer. As a Government Funding Agency (GFA), PCAARRD is mandated to provide assistance to various Research and Development Institutes (RDIs) and State Universities and Colleges (SUCs) in protecting and managing intellectual properties, including commercialization. As part of this initiative, PCAARRD launched the DOST-PCAARRD Innovation and Technology Center (DPITC) last March 2016. This IP-TBM Program aims to strengthen the capacities of Intellectual Property and Technology Business Management of selected SUCs and RDIs to enhance their technology commercialization activities. IP-TBMs are technology transfer offices in the target agencies that mirror the initiatives of the DPITC..	Products - 1 inventory of IP assets - At 1 Technology (products, processes, and systems) commercialized - 5 PAS reports	CSPC	Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs Technology transfer officers/managers SUC Researchers/Inventors	1-Jan-20	30-Jun-22	ONGOING	1,631,716	647,837

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 4C. Enhancing Technology Transfer through IP-TBM in Sorsogon State College (SSC)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	By virtue of RA 10055 DOST-PCAARRD has effectively acquired an additional mandate for technology transfer. As a Government Funding Agency (GFA), PCAARRD is mandated to provide assistance to various Research and Development Institutes (RDIs) and State Universities and Colleges (SUCs) in protecting and managing intellectual properties, including commercialization. As part of this initiative, PCAARRD launched the DOST-PCAARRD Innovation and Technology Center (DPITC) last March 2016. This IP-TBM Program aims to strengthen the capacities of Intellectual Property and Technology Business Management of selected SUCs and RDIs to enhance their technology commercialization activities. IP-TBMs are technology transfer offices in the target agencies that mirror the initiatives of the DPITC.	Products - 1 inventory of IP assets - At 1 Technology (products, processes, and systems) commercialized - 5 PAS reports	SSC	Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs Technology transfer officers/managers SUC Researchers/Inventors	1-Jan-20	30-Jun-22	ONGOING	1,631,716	667,579
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 4D. Enhancing Technology Transfer through IP-TBM in Catanduanes State University (CatSU)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	By virtue of RA 10055 DOST-PCAARRD has effectively acquired an additional mandate for technology transfer. As a Government Funding Agency (GFA), PCAARRD is mandated to provide assistance to various Research and Development Institutes (RDIs) and State Universities and Colleges (SUCs) in protecting and managing intellectual properties, including commercialization. As part of this initiative, PCAARRD launched the DOST-PCAARRD Innovation and Technology Center (DPITC) last March 2016. This IP-TBM Program aims to strengthen the capacities of Intellectual Property and Technology Business Management of selected SUCs and RDIs to enhance their technology commercialization activities. IP-TBMs are technology transfer offices in the target agencies that mirror the initiatives of the DPITC.	Products - 1 inventory of IP assets - At 1 Technology (products, processes, and systems) commercialized - 5 PAS reports	CatSU	Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs Technology transfer officers/managers SUC Researchers/Inventors	1-Jan-20	30-Jun-22	ONGOING	1,631,716	699,353
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 4E. Enhancing Technology Transfer through IP-TBM in Central Bicol State University for Agriculture (CBSUA)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	By virtue of RA 10055 DOST-PCAARRD has effectively acquired an additional mandate for technology transfer. As a Government Funding Agency (GFA), PCAARRD is mandated to provide assistance to various Research and Development Institutes (RDIs) and State Universities and Colleges (SUCs) in protecting and managing intellectual properties, including commercialization. As part of this initiative, PCAARRD launched the DOST-PCAARRD Innovation and Technology Center (DPITC) last March 2016. This IP-TBM Program aims to strengthen the capacities of Intellectual Property and Technology Business Management of selected SUCs and RDIs to enhance their technology commercialization activities. IP-TBMs are technology transfer offices in the target agencies that mirror the initiatives of the DPITC.	Products - 1 inventory of IP assets - At 1 Technology (products, processes, and systems) commercialized - 5 PAS reports	CBSUA	Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs Technology transfer officers/managers SUC Researchers/Inventors	1-Jan-20	30-Jun-22	ONGOING	1,631,716	715,768
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 5. Sustaining CapSU's IP-TBM Office and Enhancing IP-TBM Offices among Member Agencies of the Western Visayas Agriculture and Resources Research and Development Consortium (WESVAARRDEC) (Old Title: Sustaining the Existing Intellectual Property and Technology Business Management (IP-TBM) Office of Capiz State University (CapSU) and Establishing New IP-TBMO among Member Agencies of the Western Visayas Agriculture and Resources Research and Development Consortium (WESVAARRDEC))	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The Philippines marked its first innovation achiever position in the 2019 Global Innovation Index, posting a big jump to 54th place from the previous year's 73rd position as it catches up with world leaders (www.pna.gov.ph). With a total score of 38.18 over 100, the report said the Philippines is among the countries that have "above expectations for level of development" among lower middle income economies. The report said governments around the globe have increased the use of intellectual property in their quest for innovation, with investments on R&D growing more than double between 1996 and 2016. It said R&D expenditures of governments around the world rose by 5 percent while business R&D expenditures went up by 6.7 percent, the biggest jump since 2011. MalacaÃ±ang also welcomed results of the latest GII report, saying in a statement that it commends the departments and agencies (e.g., Department of Science and Technology (DOST) and Department of Trade and Industry (DTI)) that helped achieve the improvement in the country's global rank. "May this good news further motivate them in creating an environment that nurtures innovation and creates business opportunities as we become one of the fastest growing economies in the globe," Presidential Spokesperson Salvador S. Panelo was quoted as saying. (https://www.bworldonline.com/philippines-breaks-into-ranks-of-innovation-achievers-report/) The DOST is one of the identified "start-up enablers" in the Innovative Startup Act and is intent on providing the rightful support. The recently signed "Innovative Startup Act" will provide us the mechanism to further improve our support to new businesses with brilliant ideas and fast-track innovation and trade in country. The use of innovative technologies or intellectual properties is one of the basic components for a start-up. Hence, sustaining our initiatives on intellectual property and technology business management is imperative to sustain and intensify our efforts towards making IP into a usable and profitable asset for businesses. The prospect of commercializing IPs is bright as the government is aligning major programs and policies to help our innovators and entrepreneurs. PCAARRD have somehow contributed to the Country's improving ranking in the GII report as intellectual property protection and management'including commercialization' are among the priorities of the Council. In 2016, PCAARRD concretized its technology commercialization initiatives through the DOST-PCAARRD Innovation and Technology Center (DPITC). In 2017, one of the big-ticket programs under the DPITC was approved, titled as the Intellectual Property and Technology Business Management (IP-TBM) program. The IP-TBM program aims to strengthen the capacities of selected SUCs and RDIs on IP and technology business management to enhance their technology commercialization activities. IP-TBMs are technology transfer offices that are envisioned to mirror the initiatives of the DPITC, which serves as a one-stop hub for technology owners and generators, investors, end users and other stakeholders within the AANR innovation system.	1 updated inventory of IP Asset 1 Technology Commercialization Plan 40 PAS reports of R&D proposals and IP applications At least 2 Technologies (products, processes, and systems) Commercialized 1 Regional Sustainability Plan At least 5 IP-TBM staff extensively trained under the IP Master Class and Technology Commercialization Mentorship Series (modules 1-3) At least 2 exploratory meetings/networking events and technology promotion activities conducted by the SUC At least 2 technology takers/adopters At least 30 SUC trained (short duration/echo seminar) on IP Management and Technology Commercialization with IP-TBM-Mentor staff as trainer/speaker At least 4 promotional IECs for SUC/RDI technologies At least 2 consolidated technical reports (with report of income from commercialization agreements) At least 2 activity evaluation and documentation reports 1 training evaluation and documentation reports (Modules 1-3)	CapSU	Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs/RDIs Technology transfer officers/managers SUC/RDI Researchers/Inventors Technology takers	1-Jan-20	30-Jun-22	ONGOING	4,002,914	1,513,099
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 5A. Enhancing Technology Transfer through IP-TBM in Aklan State University (ASU)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	By virtue of RA 10055 DOST-PCAARRD has effectively acquired an additional mandate for technology transfer. As a Government Funding Agency (GFA), PCAARRD is mandated to provide assistance to various Research and Development Institutes (RDIs) and State Universities and Colleges (SUCs) in protecting and managing intellectual properties, including commercialization. As part of this initiative, PCAARRD launched the DOST-PCAARRD Innovation and Technology Center (DPITC) last March 2016. This IP-TBM Program aims to strengthen the capacities of Intellectual Property and Technology Business Management of selected SUCs and RDIs to enhance their technology commercialization activities. IP-TBMs are technology transfer offices in the target agencies that mirror the initiatives of the DPITC.	Products - 1 inventory of IP assets - At 1 Technology (products, processes, and systems) commercialized - 5 PAS reports	ASU	Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs Technology transfer officers/managers SUC Researchers/Inventors	1-Jan-20	30-Jun-22	ONGOING	1,686,966	752,394

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 5B. Enhancing Technology Transfer through IP-TBM in University of Antique (UA)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	By virtue of RA 10055 DOST-PCAARRD has effectively acquired an additional mandate for technology transfer. As a Government Funding Agency (GFA), PCAARRD is mandated to provide assistance to various Research and Development Institutes (RDIs) and State Universities and Colleges (SUCs) in protecting and managing intellectual properties, including commercialization. As part of this initiative, PCAARRD launched the DOST-PCAARRD Innovation and Technology Center (DPITC) last March 2016. This IP-TBM Program aims to strengthen the capacities of Intellectual Property and Technology Business Management of selected SUCs and RDIs to enhance their technology commercialization activities. IP-TBMs are technology transfer offices in the target agencies that mirror the initiatives of the DPITC.	Products - 1 inventory of IP assets - At 1 Technology (products, processes, and systems) commercialized - 5 PAS reports	UA	Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs Technology transfer officers/managers SUC Researchers/Inventors	1-Jan-20	30-Jun-22	ONGOING	1,686,966	460,725
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 5C. Enhancing Technology Transfer through IP-TBM in Guimaras State College (GSC)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	By virtue of RA 10055 DOST-PCAARRD has effectively acquired an additional mandate for technology transfer. As a Government Funding Agency (GFA), PCAARRD is mandated to provide assistance to various Research and Development Institutes (RDIs) and State Universities and Colleges (SUCs) in protecting and managing intellectual properties, including commercialization. As part of this initiative, PCAARRD launched the DOST-PCAARRD Innovation and Technology Center (DPITC) last March 2016. This IP-TBM Program aims to strengthen the capacities of Intellectual Property and Technology Business Management of selected SUCs and RDIs to enhance their technology commercialization activities. IP-TBMs are technology transfer offices in the target agencies that mirror the initiatives of the DPITC.	Products - 1 inventory of IP assets - At 1 Technology (products, processes, and systems) commercialized - 5 PAS reports	GSC	Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs Technology transfer officers/managers SUC Researchers/Inventors	1-Jan-20	30-Jun-22	ONGOING	1,686,966	703,549
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 5D. Enhancing Technology Transfer through IP-TBM in Northern Iloilo Polytechnic State College (NIPSC)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	By virtue of RA 10055 DOST-PCAARRD has effectively acquired an additional mandate for technology transfer. As a Government Funding Agency (GFA), PCAARRD is mandated to provide assistance to various Research and Development Institutes (RDIs) and State Universities and Colleges (SUCs) in protecting and managing intellectual properties, including commercialization. As part of this initiative, PCAARRD launched the DOST-PCAARRD Innovation and Technology Center (DPITC) last March 2016. This IP-TBM Program aims to strengthen the capacities of Intellectual Property and Technology Business Management of selected SUCs and RDIs to enhance their technology commercialization activities. IP-TBMs are technology transfer offices in the target agencies that mirror the initiatives of the DPITC.	Products - 1 inventory of IP assets - At 1 Technology (products, processes, and systems) commercialized - 5 PAS reports	NIPSC	Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs Technology transfer officers/managers SUC Researchers/Inventors	1-Jan-20	30-Jun-22	ONGOING	1,686,966	690,794
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 5E. Enhancing Technology Transfer through IP-TBM in Central Philippines State University (CPSU)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	By virtue of RA 10055 DOST-PCAARRD has effectively acquired an additional mandate for technology transfer. As a Government Funding Agency (GFA), PCAARRD is mandated to provide assistance to various Research and Development Institutes (RDIs) and State Universities and Colleges (SUCs) in protecting and managing intellectual properties, including commercialization. As part of this initiative, PCAARRD launched the DOST-PCAARRD Innovation and Technology Center (DPITC) last March 2016. This IP-TBM Program aims to strengthen the capacities of Intellectual Property and Technology Business Management of selected SUCs and RDIs to enhance their technology commercialization activities. IP-TBMs are technology transfer offices in the target agencies that mirror the initiatives of the DPITC.	Products - 1 inventory of IP assets - At 1 Technology (products, processes, and systems) commercialized - 5 PAS reports	CPSU	Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs Technology transfer officers/managers SUC Researchers/Inventors	1-Jan-20	30-Jun-22	ONGOING	1,686,966	704,633
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 6. Sustaining USeP's IP-TBM Office and Enhancing IP-TBM Offices Among Member Agencies of the Southern Mindanao Agriculture, Aquatic and Natural Resources Research and Development Consortium (SMAARRDEC)(Old Title: Sustaining the Intellectual Property and Technology Business Management (IP-TBM) Office of University of Southeastern Philippines (USeP) and Establishing IP-TBM in Consortium Member Institution (CMI) of SMAARRDEC in Davao Region)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	It is significantt to note that for more than a decade, USeP has been the base agency of Southern Mindanao Agriculture, Aquatic and Resources Research and Development Consortium (SMAARRDEC), a 23-member consortium of line agencies and research institutions in agriculture and agri-related research and development. It housed the Innovation and Technology Support Office (ITSO), a franchise of the Intellectual Property Office of the Philippines (IPOPHL) where said office was awarded as the top patent filer of the IPOPHIL for the year 2014-2015. In 2016, the Knowledge and Technology Transfer Division was created by virtue a board resolution. Its mandate is to carry out the innovation mandate of the University from the generation of idea to the commercialization. The need to establish and support TTOs in SUCs and RDIs was reiterated in two recently held important events: The National Conference of the Philippine California Advanced Research Institutes (May 2017) and the official launching by IPOPHL of the National IP Strategy (June 2017). Both events were attended by high ranking officials of the DOST, CHED and IPOPHL who also served as speakers. Likewise, the recent collaboration of PCAARRD with World Intellectual Property Office (WIPO) also hopes to strengthen the existing SUC/RDI-based TTOs. The transfer and commercialization of the findings of research in various fields has demonstrable benefits for the productivity of university researchers, research institutions and local economic development. Information about the recent advancement on Research and Development (R&D) and S & T-based Technologies is the cornerstone of any long-range competitive strategy. For these reasons, USeP is motivated to develop and capacitate its human resource in IP protection and management, licensing of its technologies or engaging into commercialization. USeP also aims to help its community by developing and equipping local entrepreneurs with the skills and stamina to turn novel ideas into successful ventures in the fast-paced economy today. Enhancing the Intellectual Property and Technology Business Management (IP-TBM) Operations in University of Southeastern Philippines will serve as an important tool to be able accomplished these goals. It will significantly improve its filing of patent and utility model applications and have a greater chance to penetrate the market through commercialization of its technologies.	Products â€¢1 updated inventory of IP Assets â€¢1 Technology Commercialization Plan â€¢40 Prior Art Search (PAS) reports of R&D proposals and IP applications â€¢At least 2 Technologies (products, processes, and systems) Commercialized â€¢1 Regional Sustainability Plan People and Services â€¢At least 5 IP-TBM staff extensively trained under the IP Master Class and Technology Commercialization Mentorship Series (modules 1-3) â€¢At least 2 exploratory meetings/networking events and technology promotion activities conducted by the SUC â€¢At least 2 technology takers/adopters â€¢At least 30 SUC trained (short duration/echo seminar) on IP Management and Technology Commercialization with IP-TBM-Mentor staff as trainer/speaker Publications â€¢At least 4 promotional IECs for SUC technologies Patents â€¢At least 10 IP applications (patent and UM) Places and Partnerships â€¢1 Letter of Commitment from SUC â€¢At least 2 partnership agreements with the Philippine Chamber of Commerce Inc./Business Groups/Marketing or Trade Institutions â€¢At least 2 commercialization agreements executed Policies â€¢Full implementation of IP policy and technology transfer protocol (with internal memos, AOs)	USeP	Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs/RDIs Technology transfer officers/managers SUC/RDI Researchers/Inventors Technology takers	1-Jan-20	30-Jun-22	ONGOING	3,392,885	1,149,198

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 6A. Enhancing Technology Transfer through IP-TBM in University of the Philippines Mindanao (UPMin)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	By virtue of RA 10055 DOST-PCAARRD has effectively acquired an additional mandate for technology transfer. As a Government Funding Agency (GFA), PCAARRD is mandated to provide assistance to various Research and Development Institutes (RDIs) and State Universities and Colleges (SUCs) in protecting and managing intellectual properties, including commercialization. As part of this initiative, PCAARRD launched the DOST-PCAARRD Innovation and Technology Center (DPITC) last March 2016. This IP-TBM Program aims to strengthen the capacities of Intellectual Property and Technology Business Management of selected SUCs and RDIs to enhance their technology commercialization activities. IP-TBMs are technology transfer offices in the target agencies that mirror the initiatives of the DPITC.	Products a€¢1 inventory of IP assets a€¢At 1 Technology (products, processes, and systems) commercialized a€¢5 PAS reports People and Services a€¢At least 1 IP-TBM staff extensively trained under the IP Master Class and Technology Commercialization Mentorship Series a€¢At least 20 SUC Staff trained (short duration/echo seminar) on IP Management and Technology Commercialization with IP-TBM-Mentee staff as trainer/speaker a€¢At least 2 exploratory meetings/networking events and technology promotion activities conducted by the SUC a€¢At least 1 technology takers/adopters Publications a€¢At least 2 promotional IECs for SUC technologies Patents a€¢At least 5 IP (patent and UM) applications Places and Partnerships a€¢1 IP-TBM established/enhanced/institutionalized a€¢1 Letter of Commitment from SUC a€¢At least 1 commercialization agreements executed a€¢At least 1 partnership agreements with the Philippine Chamber of Commerce Inc./Business Groups/Marketing or Trade Institutions Policies a€¢1 Institutional IP Policy reviewed/crafted/presented to approving bodies a€¢1 Technology Transfer Protocol reviewed/crafted/ presented to approving bodies	UPMin	Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs Technology transfer officers/managers SUC Researchers/Inventors	1-Jan-20	30-Jun-22	ONGOING	1,686,966	701,558
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 6B. Enhancing Technology Transfer through IP-TBM in Davao del Norte State College (DNSC)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	By virtue of RA 10055 DOST-PCAARRD has effectively acquired an additional mandate for technology transfer. As a Government Funding Agency (GFA), PCAARRD is mandated to provide assistance to various Research and Development Institutes (RDIs) and State Universities and Colleges (SUCs) in protecting and managing intellectual properties, including commercialization. As part of this initiative, PCAARRD launched the DOST-PCAARRD Innovation and Technology Center (DPITC) last March 2016. This IP-TBM Program aims to strengthen the capacities of Intellectual Property and Technology Business Management of selected SUCs and RDIs to enhance their technology commercialization activities. IP-TBMs are technology transfer offices in the target agencies that mirror the initiatives of the DPITC.	Products a€¢1 inventory of IP assets a€¢At 1 Technology (products, processes, and systems) commercialized a€¢5 PAS reports People and Services a€¢At least 1 IP-TBM staff extensively trained under the IP Master Class and Technology Commercialization Mentorship Series a€¢At least 20 SUC Staff trained (short duration/echo seminar) on IP Management and Technology Commercialization with IP-TBM-Mentee staff as trainer/speaker a€¢At least 2 exploratory meetings/networking events and technology promotion activities conducted by the SUC a€¢At least 1 technology takers/adopters Publications a€¢At least 2 promotional IECs for SUC technologies Patents a€¢At least 5 IP (patent and UM) applications Places and Partnerships a€¢1 IP-TBM established/enhanced/institutionalized a€¢1 Letter of Commitment from SUC a€¢At least 1 commercialization agreements executed a€¢At least 1 partnership agreements with the Philippine Chamber of Commerce Inc./Business Groups/Marketing or Trade Institutions Policies a€¢1 Institutional IP Policy reviewed/crafted/presented to approving bodies a€¢1 Technology Transfer Protocol reviewed/crafted/ presented to approving bodies	DNSC	Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs Technology transfer officers/managers SUC Researchers/Inventors	1-Jan-20	30-Jun-22	ONGOING	1,686,966	699,015
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 6C. Enhancing Technology Transfer through IP-TBM in Davao Oriental State College of Science and Technology (DOSCST)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	By virtue of RA 10055 DOST-PCAARRD has effectively acquired an additional mandate for technology transfer. As a Government Funding Agency (GFA), PCAARRD is mandated to provide assistance to various Research and Development Institutes (RDIs) and State Universities and Colleges (SUCs) in protecting and managing intellectual properties, including commercialization. As part of this initiative, PCAARRD launched the DOST-PCAARRD Innovation and Technology Center (DPITC) last March 2016. This IP-TBM Program aims to strengthen the capacities of Intellectual Property and Technology Business Management of selected SUCs and RDIs to enhance their technology commercialization activities. IP-TBMs are technology transfer offices in the target agencies that mirror the initiatives of the DPITC.	Products a€¢1 inventory of IP assets a€¢At 1 Technology (products, processes, and systems) commercialized a€¢5 PAS reports People and Services a€¢At least 1 IP-TBM staff extensively trained under the IP Master Class and Technology Commercialization Mentorship Series a€¢At least 20 SUC Staff trained (short duration/echo seminar) on IP Management and Technology Commercialization with IP-TBM-Mentee staff as trainer/speaker a€¢At least 2 exploratory meetings/networking events and technology promotion activities conducted by the SUC a€¢At least 1 technology takers/adopters Publications a€¢At least 2 promotional IECs for SUC technologies Patents a€¢At least 5 IP (patent and UM) applications Places and Partnerships a€¢1 IP-TBM established/enhanced/institutionalized a€¢1 Letter of Commitment from SUC a€¢At least 1 commercialization agreements executed a€¢At least 1 partnership agreements with the Philippine Chamber of Commerce Inc./Business Groups/Marketing or Trade Institutions Policies a€¢1 Institutional IP Policy reviewed/crafted/presented to approving bodies a€¢1 Technology Transfer Protocol reviewed/crafted/ presented to approving bodies	DOSCST	Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs Technology transfer officers/managers SUC Researchers/Inventors	1-Jan-20	30-Jun-22	ONGOING	1,686,966	658,761
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 6D. Enhancing Technology Transfer through IP-TBM in Davao del Sur State College (DSSC) (formerly SPAMAST)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	By virtue of RA 10055 DOST-PCAARRD has effectively acquired an additional mandate for technology transfer. As a Government Funding Agency (GFA), PCAARRD is mandated to provide assistance to various Research and Development Institutes (RDIs) and State Universities and Colleges (SUCs) in protecting and managing intellectual properties, including commercialization. As part of this initiative, PCAARRD launched the DOST-PCAARRD Innovation and Technology Center (DPITC) last March 2016. This IP-TBM Program aims to strengthen the capacities of Intellectual Property and Technology Business Management of selected SUCs and RDIs to enhance their technology commercialization activities. IP-TBMs are technology transfer offices in the target agencies that mirror the initiatives of the DPITC.	Products a€¢1 inventory of IP assets a€¢At 1 Technology (products, processes, and systems) commercialized a€¢5 PAS reports People and Services a€¢At least 1 IP-TBM staff extensively trained under the IP Master Class and Technology Commercialization Mentorship Series a€¢At least 20 SUC Staff trained (short duration/echo seminar) on IP Management and Technology Commercialization with IP-TBM-Mentee staff as trainer/speaker a€¢At least 2 exploratory meetings/networking events and technology promotion activities conducted by the SUC a€¢At least 1 technology takers/adopters Publications a€¢At least 2 promotional IECs for SUC technologies Patents a€¢At least 5 IP (patent and UM) applications Places and Partnerships a€¢1 IP-TBM established/enhanced/institutionalized a€¢1 Letter of Commitment from SUC a€¢At least 1 commercialization agreements executed a€¢At least 1 partnership agreements with the Philippine Chamber of Commerce Inc./Business Groups/Marketing or Trade Institutions Policies a€¢1 Institutional IP Policy reviewed/crafted/presented to approving bodies a€¢1 Technology Transfer Protocol reviewed/crafted/ presented to approving bodies	SPAMAST	Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs Technology transfer officers/managers SUC Researchers/Inventors	1-Jan-20	30-Jun-22	ONGOING	1,686,966	568,920
Support to the University's Strategies in Technology Acceleration Initiatives by Nurturing (SUSTAIN) the Intellectual Property and Technology Business Management (IP-TBM) Offices of the Consortia Member Agencies (Phase II)	Project 6E. Enhancing Technology Transfer through IP-TBM in Compostela Valley State College (CVSC)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	By virtue of RA 10055 DOST-PCAARRD has effectively acquired an additional mandate for technology transfer. As a Government Funding Agency (GFA), PCAARRD is mandated to provide assistance to various Research and Development Institutes (RDIs) and State Universities and Colleges (SUCs) in protecting and managing intellectual properties, including commercialization. As part of this initiative, PCAARRD launched the DOST-PCAARRD Innovation and Technology Center (DPITC) last March 2016. This IP-TBM Program aims to strengthen the capacities of Intellectual Property and Technology Business Management of selected SUCs and RDIs to enhance their technology commercialization activities. IP-TBMs are technology transfer offices in the target agencies that mirror the initiatives of the DPITC.	Products a€¢1 inventory of IP assets a€¢At 1 Technology (products, processes, and systems) commercialized a€¢5 PAS reports People and Services a€¢At least 1 IP-TBM staff extensively trained under the IP Master Class and Technology Commercialization Mentorship Series a€¢At least 20 SUC Staff trained (short duration/echo seminar) on IP Management and Technology Commercialization with IP-TBM-Mentee staff as trainer/speaker a€¢At least 2 exploratory meetings/networking events and technology promotion activities conducted by the SUC a€¢At least 1 technology takers/adopters Publications a€¢At least 2 promotional IECs for SUC technologies Patents a€¢At least 5 IP (patent and UM) applications Places and Partnerships a€¢1 IP-TBM established/enhanced/institutionalized a€¢1 Letter of Commitment from SUC a€¢At least 1 commercialization agreements executed a€¢At least 1 partnership agreements with the Philippine Chamber of Commerce Inc./Business Groups/Marketing or Trade Institutions Policies a€¢1 Institutional IP Policy reviewed/crafted/presented to approving bodies a€¢1 Technology Transfer Protocol reviewed/crafted/ presented to approving bodies	DDOSC(CVSC)	Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs Technology transfer officers/managers SUC Researchers/Inventors	1-Jan-20	30-Jun-22	ONGOING	1,686,966	689,518
	Adoption of Improved Commercial-Scale Mangrove Crab Hatchery-Nursery System in Parang, Maguindanao	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Among the coastal municipalities of Maguindanao, Parang is the only municipality with an established municipal fisheries code. Parang also offers a strategic site for the proposed project which is only 30-minute away from Cotabato City. The proposed site in Parang also satisfied the site selection criteria for the project. The political will and commitment of the current administration in the LGU of Parang also favor the establishment and sustainability of this project. The establishment of a model hatchery will enable LGU Parang to produce mangrove crab seedstock in commercial quantities to augment the supply of crablets in the province without depleting the natural stocks. At present, there is no reliable source of seedstock in Maguindanao. This proposed hatchery is expected to supply 3-5% of the total demand for crablets in the province which will eventually result in an estimated 14% volume increase in mangrove crab production from 97.67 MT to 102.9 MT valued at P35.2 million. The proposed hatchery will also supply crablets for farming in Cotabato City, other provinces in BARMM like Lanao del Sur and Basilan, and nearby provinces like Lanao del Norte and Zamboanga del Sur.	a€¢ 1,500 pcs IEC materials a€¢ 2 infomercial videos a€¢ 480,000 hatchery-reared mangrove crablets a€¢ 5 MSU-Maguindanao/LGU personnel trained in mangrove crab hatchery-nursery operation a€¢ 50 PO members trained in nursery operation a€¢ 1 commercial-scale mangrove crab hatchery-nursery facility a€¢ 1 MOA forged with LGU Parang a€¢ 1 MOA forged with MAFAR-BARMM a€¢ Policy inputs to municipal ordinances a€¢ 3 copyrights from IEC materials a€¢ 2 copyrights from infomercial videos	MSU-Maguindanao	Mangrove crab hatchery-nursery operators in Parang, Maguindanao	1-Apr-21	31-Mar-23	ONGOING	9,900,016	7,257,008

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
	Adoption of Improved Hatchery-Nursery Culture System for Commercial Production of Mangrove Crab Seedstock in Infanta, Quezon	KRA 3: Rapid, Inclusive and Sustained Economic Growth	One of the major factors that limit the expansion of mangrove crab enterprise is the inadequate supply of seedstock to support the grow-out operations. The establishment of hatcheries and nurseries for the production of seedstock and crablets, respectively, coupled with better management of the wild stock resources are, in essence, long-term solutions that will potentially support the sustainability of the mangrove crab industry in the Philippines. The availability of the hatchery-bred crab seedstocks seemingly offer practical solutions to problems linked to local availability of the seeds for grow-out production, seasonality of the seedstock supply sourced from the wild, and even conservation of the wild population (Gaillard, 2010). The consistent efforts of the Philippine government (and the other ASEAN countries) to develop/improve the hatchery-nursery technologies for mangrove crab, are good indications for its potential to positively contribute as an industry, in the economic progress of these nations. The optimizations of the mangrove crab farming technologies have been recently attained under several S&T programs for enhanced culture systems for improved hatchery (Program A) and nursery (Program B) culture production systems. The proactive and sustained support from the DOST-PCAARRD, paved the implementation of S&T programs that covered five component projects: Program A â€“ R&D for Improvement of the Hatchery System â€¢Component 1 â€“ Development of Techniques for the Mass Production of Marine Annelids as Live Feeds for the Mangrove Crab (Scylla serrata) Broodstock â€¢Component 2 â€“ Improvement of the Larval Rearing Hatchery â€¢ Program B â€“ R&D for Improvement of the Nursery System â€¢Component 1 â€“ Refinement of Efficient Diets for Nursery Culture â€¢Component 2 â€“ Application of Strategies for the Reduction of Cannibalism in the Mangrove Crab Nursery â€¢Component 3 â€“ Development of Protocols for the Production of Hatchery-Reared Mangrove Crab Juveniles for Soft Shell Crab Farming	Publications1,500 pcs IEC Materials produced2 informercial videosProducts480,000 pcs crabletsPeople and Services5 personnel from LSPU and LGU-Infanta trained in crab-hatchery-nursery operations50 PO members trained in crab nursery operations1 commercial crab hatchery-nursery system facility establishedPlaces and Partnerships1 MOAs forged with LGU-InfantaPolicies1 policy briefs draftedPatents5 copyrights filed	LSPU	Mangrove crab hatchery-nursery operators in Infanta, Quezon	16-May-21	15-May-23	ONGOING	10,384,775	7,697,486
	Advancing Science for the Convergence of Agriculture and Tourism (SciCAT) in MKATF Phase II	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will be implemented for 2 years (January 1, 2021 - December 31, 2022) by the Department of Science and Technology Region X in Malaybalay City, Bukidnon, with a total PCAARRD-GIA funding of Php 4,986,806.24. It generally aims to sustain the gains from Phase I and further hone SciCAT-MKATF, Sinaburan, Imbayao, Malaybalay City, Bukidnon as a full agritourism site in Region 10 under the new normal. Specifically, the project will focus on the value-adding of the existing crops of MKATF to generate more revenue by removing middlemen from the supply chain, taking advantage of the demand for fresh and processed local products, marketing small quantities of products, or offering experiences on the farm.	PEOPLE AND SERVICES 500 Trained farm owners/farming enthusiasts 8 Conducted webinars 40 Package of Technology adopters 50 monthly average No. of engagements on social media sites (i.e. likes, shares, comments, inquiries) 2 Jobs generated 1 Lab test for organic concoctions PRODUCTS 8 POTs downloaded 100 packs 100g powdered coffee 100 packs 100g dehydrated bell pepper 100 packs 100g chilli powder PUBLICATIONS 10 IEC Materials prepared 10 Training modules prepared 2 Promotional AVP prepared 2 Concoction Modules prepared PATENTS 10 Copyrights generated for IEC materials PLACES AND PARTNERSHIPS 8 Signed and notarized MOA/MOUs 4 Signed and notarized MOA/MOUs for MLGU and DOT partnerships	DOST-X	Farmers, farm entrepreneurs, private and government agencies/organizations, LGUs, SUCs, students, farming enthusiast and farm visitors	1-Jan-21	31-Dec-22	ONGOING	4,986,806	2,920,964
	Assessment of the S&T Community-Based for Inclusive Development (STC4iD) Program through Projects Implemented in Sorsogon (Magallanes), Siquijor (Enrique Villanueva) Bukidnon (Maramag), Sultan Kudarat (Lebak), and Sulu (Jolo)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Development is an organized intervention in collective affairs according to a standard of improvement that varies according to class, culture, historical context, and relations of power (Pieterse, 2001). The swift and continuous development process has brought countless significant changes in every aspect of society and the world has made great progress in addressing poverty; however, there are still many people who remain vulnerable and are left behind. The benefits of development are not reaching large segments of the population in many developing countries, especially in the Philippines. The exclusive focus on growth is not enough to end poverty leading to widespread inequality. Moreover, economic growth did not translate into poverty reduction in recent years. According to UN Report on the World Social Situation 2016, societies cannot be considered inclusive if poverty remains widespread, inequalities are high or growing and decent work opportunities are lacking. The study of the Asian Development Bank (ADB) in 2009 stated that â€œPoverty remains a mainly rural phenomenon, though urban poverty is on the rise. The majority of the poor are still found in rural areas and in the agriculture sector, primarily as farmers and fishersâ€ still rang true amidst the almost 10-year gap based on the study made by the World Bank in 2018. According to World Bank (2018), poor Filipinos live in relatively large households, with disproportionately low educational attainment, headed by individuals who are self-employed or work in agriculture as laborers or smallholder producers. Households that rely on agriculture as the main source of income, such as farmers and fishermen, are the poorest. In order to address this, there is a need for specific policies and measures that require the involvement of all actors to ensure that everyone can benefit from growth, particularly the vulnerable groups. Leaving no one behind is the imperative of inclusive development. For the Asian Development Bank (ADB), while there is no agreed-upon and common definition, the concept of inclusive development is understood to refer to â€œgrowth coupled with equal opportunities (Ali and Zhuang, 2007; Ali and Son, 2007). It focuses on creating opportunities and making them accessible to all, not just to the poor. There is inclusive growth when all members of a society participate in and contribute to the growth process equally, regardless of their individual circumstances (Rauniyar and Kanbur, 2009). Hence, there is a need to heed the call and support inclusive development for the benefit of the marginalized Filipino people who largely depend on the agriculture, aquatic and natural resources (AANR) sector for livelihood and employment. These sectors encompass the primary industries and rural-upland-coastal areas, the same sectors where most of the poorest of the poor provinces of the country are found. Hence, in order to attain inclusive development, the plight of AANR-dependent communities in the poorest of the poor areas of the country has to be addressed.	5 consultation meetings conducted 1 mentored student 2 articles packaged for publication 1 policy developed/ policy input in support of technology transfer approach in GESDA communities 1 GESDA community assessment report	UPLB	STC4iD Modality	16-Oct-21	15-Oct-22	ONGOING	1,500,000	1,500,000
	ATBI Networking and Capacity Building Phase 2	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Spurred on by various laws for the improvement of the mechanism for the diffusion and utilization of technologies and enabling the effective support to technology transfer, DOST-PCAARRD instituted the establishment of agri-aqua technology business incubators in the country. From June to August 2017, the PCAARRD Directors Council, the PCAARRD Governing Council and the DOST Executive Committee had approved the implementation and funding of six TBI projects implemented by Benguet State University (BSU), Isabela State University (ISU), Central Luzon State University (CLSU), Cavite State University (CvSU), University of the Philippines â€“ Visayas (UPV) and Visayas State University (VSU). To support the activities of these six TBIs and ensure the successful and harmonized implementation of the TBI activities and monitor the milestones and accomplishments of the TBI ecosystem in the country, a coordination and management component was established as part of the program.	Publication At least 6 Training modules prepared/ enhanced At least 6 training modules prepared/ enhanced 1 Compendium of ATBI experts prepared 1 Compendium of ATBI technologies prepared 1 Compendium of start-up/spin-off incubatees prepared 1 Coffee table book on ATBI in the Philippines developed 1 Annual Report and 2 Semi-annual Reports prepared and submitted 1 Annual Report and 2 Semi-annual Reports prepared and submitted 1 Terminal Report prepared and submitted Patent/ Copyright At least 3 publications for copyright filed 6 People and Services 1 ATBI master class conducted (with at least 6 modules) and attended by ATBI management and staff 1 ATBI master class conducted (with at least 6 modules) and attended by ATBI management and staff At least 50 ATBI personnel trained on TBI management At least 50 ATBI personnel trained on TBI management 1 National Conference on TBI conducted; attended by all TBIs in the agri-aqua sector, stakeholders, and partners 1 National Conference on TBI conducted; attended by all TBIs in the agri-aqua sector, stakeholders, and partners 1 Incubatee Summit (with pitching activity) conducted; attended by incubatees/ acceleratees from all ATBIs, stakeholders, and partners 1 Incubatee Summit (with pitching activity) conducted; attended by incubatees/ acceleratees from all ATBIs, stakeholders, and partners At least 1 national training for ATBI graduates from all ATBIs conducted At least 1 national training for ATBI graduates from all ATBIs conducted At least 2 webinars for the general public as promotion of the program conducted At least 2 webinars for the general public as promotion of the program conducted	BSU	At least 16 ATBIs o 6 from Batch I + 8 from Batch II + 2 from Batch III TBIs + new ATBIs in 2021 and 2022 (2-9 new ATBIs + 11 ATBIs in Advanced Incubation + 3 ATBIs in Acceleration) New ATBIs: 1. Mariano Marcos State University, Batac, Ilocos Norte 2. University of Southern Mindanao (USM), Kabacan, North Cotabato 3. At least 9 new ATBIs within 2021-2022 ATBIs in Advanced Incubation: 4. Cavite State University (CVSU), Indang, Cavite 5. Capiz State University (CapSU), Roxas City, Capiz; 6. Central MIndanao University (CMU), Maramag, Bukidnon 7. Don Mariano Marcos Memorial State University (DMMMSU), La Union 8. Forest Products Research and Development Institute (FPRDI), Los BaÃ±os, Laguna 9. Isabela State University, Echague, Isabela 10. Laguna State Polytechnic University (LSPU), San Pablo, Laguna 11. Sultan Kudarat State University (SKSU), Tacurong City, Sultan Kudarat 12. Western Mindanao State University (WMSU), Zamboanga del Sur 13. University of the Philippines in the Visayas, Iloilo City 14. Western Philippines University (WPU), Puerto Prinsesa, Palawan ATBIs in Acceleration: 15. Benguet State University, La Trinidad, Benguet 16. Central Luzon State University, Science City of MuÃ±oz, Nueva Ecija 17. Visayas State University, Baybay, Leyte	1-Jul-21	30-Jun-23	ONGOING	5,000,000	2,471,316
	Commercialization of Philippine-made Rapid Test Kits for Transboundary Animal Diseases	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Lorem Ipsum	Publication: EXPECTED OUTPUTS (6Ps) More than 500 test kits are sold within 6 months More than 100 samples are tested at the center using any of the test kits. Existing website is updated. Forged 2 MOAs with, at least, 2 potential test kit distributors from 2 different provinces within 6 months. A 3-minute informercial video of the company and its products is developed. Patent: Annex 9 (link) Annex 10 (link) Annex 11 (link)Product: Ã‚Â ANNEX 12_Rapid Test Kits (link)People: People Service or clients (link)Place: Partnership 1 (link) - UNAHCO thru the Public Private Partnership, donated kits to Kabacan & Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Davao in collabation with USM Vet College to do surveillance Partnership 2 (link) - National Livestock Program and the ITCPH sponsored virtual training Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â workshops and seminar to orient LGUs on the test kit Partnership 3 (link) - DA Regional Field Office in Bicol bought kits for surveillance Partnership 4 (link) - ADM and Neovia Philippines donated kits to Iligan, CAR, Misamis Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Oriental and Quezon Province tru the PPP programPolicy: Policy (link)	Blitzkrieg Animal Diagnostic Center	Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Ã‚Â Blitzkrieg Animal Diagnostic Center commercializes the kits. Market is reached using the different platforms and the potential customers would be the local government units, registered hog farms, registered vet biologics, registered lab. animal facilities, registered poultry farms, farm cooperatives, animal health scientists and researchers, test kit distributors and laboratory equipment suppliers. Ã‚Â	16-Dec-21	15-Dec-22	ONGOING	4,899,208	4,333,208
	Development of a Special Package to Expand the Adoption and Impact of the LIFE Model Beyond 2020	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project is primarily about inspiring the decision-makers of interested Philippine extension agencies by providing them with sufficient information to make strategic decisions about incorporating the LIFE Model into their extension programs (questions about resources, personnel, structures, and the nature of farmer involvement). The benefit to these agencies would be the opportunity to make significant improvements to the efficiency and impact of their existing and planned extension programs.	â€¢ One (1) LIFE Forum conducted â€¢ One (1) LIFE Book produced â€¢ One (1) LIFE Training Manual produced â€¢ One (1) Online LIFE Video Library produced â€¢ Three (3) copyrights filed for: 1) LIFE Training Manual; 2) Online LIFE Video Library; and 3) LIFE Book	UPMin	LGUs, NGOs, CSOs, private entities and academic institutions that can potentially adopt the LIFE model	16-Apr-21	15-Oct-21	COMPLETED	727,000	727,000
	DOST-PCAARRD AGRI-AQUA INNOVATION CHALLENGE	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will be implemented for 12 months (December 16, 2021 to December 15, 2022) by Asian Institute of Management (AIM) in 123 Paseo de Roxas, Legazpi Village, Makati, Metro Manila with a total PCAARRD-GIA funding of Php 12,996,024.00. the Innovation Challenge aims to inspire and engage the next generation of Filipinos in shaping a modern, progressive, and more relevant agriculture and aquaculture sector. It shall fast-track the creation and translation of agriculture and aquaculture technologies to actual products or services that will eventually benefit the farmers and fisherfolks, and the Filipinos in general.	Publication: At least 20 marketing collaterals for the startups/ enterprisesPatent: At least 10 teams with prototypesProduct: At least 20 enterprise owners/ founders with validated customers 10 enterprise owners/ founders with upgraded products 20 teams with identified market (need,market size)People: At least 20 enterprise owners/ founders with validated customers 10 enterprise owners/ founders with upgraded products 20 teams with identified market (need,market size)Place: At least 5 enterprises with potential partners/ investorsPolicy: None identified yet	AIM	Startup owners/foundersTechnology transfer officers/managersSUC/RDI Researchers/InventorsTechnology takers	16-Dec-21	15-Dec-22	ONGOING	12,996,024	12,996,024

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
	DOST-PCAARRD-BPSU Agri-Aqua Technology Business Incubator	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Undeniably, science, technology, and innovation (STI) play a crucial role in the achievement of 2030 Sustainable Development Goals. The process of creative disruption initiated by technological progress can help to transform economies and improve living standards, by increasing productivity, reducing production costs and prices, and helping to raise real wages. Harnessing frontier technologies â€" combined with action to address persistent gaps among developed and developing countries in access and use of existing technologies, and to develop innovations (including non-technological and new forms of social innovation) â€" could be transformative in achieving the Sustainable Development Goals and producing more prosperous, sustainable, healthy and inclusive societies.	Publication: Year 1: ATBI business plan developedÃ‚ ATBI operations manual developed A least 5 ATBI curricula developed At least 5 IEC for ATBI developedÃ‚ At least 1 promotional video for incubatees developedÃ‚ ATBI sustainability plan developedÃ‚ ATBI communication plan developed Year 2: A least 5 ATBI curricula developed At least 5 IEC for ATBI developedÃ‚ At least 1 promotional video for incubatees developedÃ‚ ATBI sustainability plan implementedÃ‚ ATBI communication plan implemented Total: ATBI business plan developedÃ‚ ATBI operations manual developed A least 10 ATBI curricula developed At least 10 IEC for ATBI developedÃ‚ At least 3 promotional video for incubatees developedÃ‚ ATBI sustainability plan developedÃ‚ ATBI communication plan developed	BPSU	University-based faculty and student researchersÃ‚ Local start-ups and MSMEs in Bataan Agri-aqua sector in the communities in Bataan Local cooperatives in Bataan Women in informal economy sector in Bataan Other marginalized sectors in Bataan	1-Nov-21	31-Oct-23	ONGOING	5,000,000	3,211,741
	DOST-PCAARRD-BSU Agri-Aqua Technology Business Incubator Phase 2	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will be implemented for 2 years (January 1, 2021 - December 31, 2022) by Benguet State University (BSU), with a total PCAARRD-GIA funding of Php 10,715,363.20. Thus, institutionalization, organizational and human capacity enhancement of both ATBI management and incubatees, physical resource establishment, long term and strategic planning, establishment and piloting of ATBI services, linkaging and innovation ecosystem enhancement were started and given emphasis in Phase 1. Strengthening these should be a continuing process. With these lessons on ATBI development and management, the challenges in technology transfer and technology commercialization also came to fore. We observed that there is a need to inventory, evaluate, and market these technologies to potential adopters with the end-goal of making a business out of it. In many cases, research outputs did not come up with commercialization-ready products or services. There were research-industry mismatches wherein the adopters needed more research done before they can use these technologies. Intellectual property protection is weak and this may be attributed to the researchers themselves, but importantly also to a less developed intellectual property management system. Managing the target clients of the ATBI also continues to become more complex because they are of varying levels (pre-incubatees, incubatees), interests, financial Page 2 of 7 capacity, knowledge and skills, ambition and grit. However, some of them have the potential for acceleration, to be encouraged to go further and expand their business	3 training modules prepared/developed At least 2 IEC materials/publications on TBI best practices developed semi-annual, annual, terminal reports prepared and submitted At least 3 applications for copyright filed 3 local (national) trainings attended by TBI project leaders and staff members 1 international training attended by project leaders/managers 2 Program reviews conducted 1 technology business accelerator program developed 6 TBIs provided with assistance 1 national association of Agri-Aqua TBIs formed and registered at SEC and applied as member to 2 international TBI associations At least 1 foreign start-up/company endorsed for potential incubation at a local agri-aqua TBI 1 TBI Business Plan enhanced 1 Operations Manual enhanced 2 TBI Curricula developed/ enhanced 6 technopreneurship manuals developed At least 2 journal articles prepared At least 2 presentations to scientific conferences conducted At least 2 applications for trademark filed At least 6 applications for copyright filed 6 technologies commercialized 30 pre-incubatees applied for potential incubation 18 incubatees accepted, trained and mentored in farming/ production 5 incubatees graduated/new enterprises created TBI impact to at least 18 incubatees/ enterprises assessed At least 26 persons trained in farming/ production technologies At least 60 persons trained on food processing technology	BSU	smallholder farmers, food processors, allied agribusinesses, 16 ATBIs	1-Jan-21	31-Dec-22	ONGOING	10,715,363	5,201,300
	DOST-PCAARRD-CapSU Agri-Aqua Technology Business Incubator Phase 2	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The DOST-PCAARRD-CAPSU Agri-Aqua Technology Business Incubator is a technology transfer and commercialization support facility of the University that aims to translate or develop products of research into a feasible technology-based enterprise. The incubator will also serve as an avenue and convergence hub that will provide services for prospect technology adopters, investors, and technology users in the fields of agriculture and aquaculture in the province of Capiz.	ATBI business plan revised as needed 1 ATBI operations manual revised as needed â€" 1 ATBI operations manual revised as needed At least 5 ATBI basic incubation curricula revised as needed At least 5 ATBI basic incubation curricula revised as needed At least 10 ATBI basic incubation curricula revised as needed At least 6 ATBI advanced incubation curricula developed â€" At least 6 ATBI advanced incubation curricula developed At least 1 IEC or promotional material for ATBI developed At least 1 IEC or promotional material for ATBI developed At least 2 IEC or promotional materials for ATBI developed At least 1 promotional video for ATBI developed At least 1 promotional video for ATBI updated At least 1 promotional video for ATBI developed and updated At least 11 IEC or promotional materials for incubatees developed At least 5 IEC or promotional materials for incubatees developed At least 16 IEC or promotional materials for incubatees developed At least 1 promotional video for incubatees developed At least 1 promotional video for incubatees developed At least 2 promotional videos for incubatees developed 1 ATBI sustainability plan revised as needed â€" 1 ATBI sustainability plan revised as needed 1 ATBI communication plan developed and implemented 1 ATBI communication plan implemented 1 ATBI communication plan developed and implemented	CapSU	The beneficiaries of this project are the Incubatees (MSMEs, farmers, researcher, faculty, youths), consortia member agencies who will establish ATBI, Capiz State University, and other stakeholders.	1-Jul-21	30-Jun-23	ONGOING	5,000,000	2,527,886
	DOST-PCAARRD-CLSU Agriculture and Food Technology Business Incubator Phase 2	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The Central Luzon State University Agriculture and Food Technology Business Incubator (CLSU-AFTBI) is a facility that assists in educating/training budding entrepreneurs, thus increasing the survival rate of innovative start-up businesses. These core mandates can be achieved by offering packages of specialized services on production and processing technologies of rice, tilapia, goat, mango, mushroom, vegetables, and dairy carabao which are relevant to countryâ€"s economic development. The implementation of the DOST-PCAARRD-CLSU Agriculture and Food Technology Business Incubator Phase 2 is a continuation of the project funded by PCAARRD from 2017 to 2019. In Phase 2, the project aims to enhance the business performance of start-up incubatees through an acceleration program that are integrated, sustainable, and innovative, thereby improving the CLSU-AFTBI incubation ecosystem.	The expected outputs of the project are the following: A. Publications 1. 1 TBI business plan revised as needed; 2. 1 TBI operations manual revised as needed; 3. At least 1 acceleration program curriculum/syllabus developed; 4. At least 4 training modules developed; 5. At least 3 IEC materials developed/revised and disseminated; 6. 1 operations manual on TBI web-based management information system developed; 7. 3 semi-annual reports prepared and submitted; 8. 3 annual reports prepared and submitted; 9. 1 terminal report prepared and submitted; B. Products 1. At least 10 technologies commercialized/adopted for incubation/acceleration; 2. 1 TBI web-based management information system developed; C. People and Services 1. At least 15 incubatees enrolled to the incubation program and launched as startup/spinoff; 2. At least 10 acceleratees enrolled to the acceleration program; 3. At least 25 business plans of the incubatees/acceleratees developed/improved; 4. At least 15 incubatees graduated from the incubation program; 5. At least 10 acceleratees graduated from the acceleration program; 6. At least 6 trainings for the incubatees/acceleratees conducted;	CLSU	The beneficiaries of this project are the following: â€¢ AFNR students and graduates â€¢ Micro, small, and medium enterprises (MSMEs) â€¢ Established companies â€¢ Start-up and spin-off companies â€¢ Farmer-entrepreneurs â€¢ CLSU faculty and staff â€¢ Business organizations and cooperatives â€¢ Local government units (LGUs)	1-Dec-19	30-Nov-22	ONGOING	14,162,397	3,901,143
	DOST-PCAARRD-CMU Agri-Aqua Technology Business Incubator Phase 2	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The CMU-ATBI will be the center for technology transfer, and business incubation of technologies generated in the university. Specifically, it will provide support services to incubatees for the commercialization of technologies. The CMU-ATBI has a business name called Mussan PEAK Incubator. The name was coined from the famous landmark of CMU, the Mussan Peak and incubator meaning business service provider for start-ups as the main purpose of the center. The PEAK is the acronym that stands for the services provided by the center namely: Product commercialization, Enterprise development, Access to networks, and Knowledge transfer. Product Commercialization is the process of bringing new products or services to market. This service includes sales and marketing tools and training and assistance in the pilot production of a product or process.	ATBI business plan revised as needed ¿ 1 ATBI operations manual revised as needed ¿ At least 10 ATBI basic incubation curricula revised as needed ¿ At least 6 ATBI advanced incubation curricula developed At least 2 IEC or promotional materials for ATBI developed ¿ At least 1 promotional video for ATBI developed and updated ¿ At least 16 IEC or promotional materials for incubatees developed ¿ At least 2 promotional videos for incubatees developed ¿ 1 ATBI sustainability plan revised as needed ¿ 1 ATBI communication plan developed and implemented At least 10 trademarks filed ¿ At least 10 copyrights filed At least 5 technologies adopted by new incubatees ¿ At least 6 technologies adopted by continuing incubatees ¿ At least 3 technologies commercialized with issued Fairness Opinion Report and signed Technology Licensing Agreemen At least 10 new incubatees enrolled at basic incubation program ¿ At least 6 continuing incubatees enrolled at advanced incubation program ¿ At least 6 continuing incubatees graduated from advanced incubation program ¿ At least 6 startups or spinoffs registered and launched ¿ At least 6 trainings for ATBI staff conducted or participated in ¿ At least 10 trainings for incubatees conducte At least 10 business plans for new incubatees developed ¿ At least 6 business plans for continuing incubatees improved ¿ At least 4 awareness seminars or promotional activities conducted ¿ At least 4 business pitching events, industry meetups, or networking events conducted or participated in ¿ ATBI operations fully integrated to PCAARRD's ATBI real-time monitoring system ¿ At least 2 consortium member-agencies mentored on ATBI operations	CMU	Start-ups/Spin-off Would-be Entrepreneurs Incubatees	1-Jul-21	30-Jun-23	ONGOING	5,000,000	2,810,375

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
	DOST-PCAARRD-CTU Agri-Aqua Technology Business Incubator	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will be implemented for 2 YearsÂ November 1, 2021 â€" October 31, 2023Â byÂ Cebu Technological UniversityÂ in R Palma Street, Cebu City, Philippines with a total PCAARRD-GIA funding of Php 5,000,000.00. to provide support to agri-aquaculture MSMEs by providing training, technology, facilities and possible access to microfinancing. It will also identify the main issues and challenges faced by the agri-aquaculture business to better offer relevant services to the MSME incubatees.	Publication: ATBI business plan developed ATBI operations manual developed At least 10 ATBI curricula developed At least 2 IEC or promotional materials for ATBI developed At least 1 promotional video for ATBI developed At least 10 IEC or promotional materials for incubatees developed At least 2 promotional videos for incubatees developed 1 ATBI sustainability plan developed and implemented 1 ATBI communication plan developed and implemented Patent: At least 10 trademarks filed At least 5 copyrights filed Product: At least 10 technologies adopted by incubatees People: At least 10 incubatees assisted At least 6 trainings for ATBI staff conducted or participated in At least 10 trainings for incubatees conducted At least 10 business plans for incubatees developed At least 3 awareness seminars or promotional activities conducted At least 3 business pitching events, industry meetups, or networking events conducted or participated in ATBI operations fully integrated to PCAARRD's ATBI real-time monitoring system Place: At least 10 MOAs/MOUs with incubatees forged At least 6 MOAs/MOUs with organizations from public and private sectors forged Policy: 1 ATBI institutionalized	CTU	Agri-aquaculture MSMEs in Central Visayas. The select Agri-aquaculture MSME incubatees can avail of the services offered by the ATBI, which can allow them to become better prepared in the business, and possibly expand with an affordable start-up environment and a range of administrative, consulting, and networking services. Local Government Units (LGUs). The MSME incubatees will help in the development of the local economy and food production as well as in the generation of livelihood or employment. Â Â Community. People from the community can be employed as the MSME becomes more developed.Â Â University/College/Institution. The ATBI can serve as an avenue to market the developed technology by researchers in the academe. A well-implemented ATBI system could enhance the universityÃ¢â‚¬â„¢s role for promoting, creating and enhancing an entrepreneurial society. It can also be made part of the extension and production functions of the institution.Â Â Microfinancing institutions. The microfinancing institutions can have better access to MSMEs as well as provide support to their needs through the ATBI. Industry. Other bigger companies in the agri-aquaculture industry can partner with the relevant MSME incubatees through the ATBI.	1-Nov-21	31-Oct-23	ONGOING	5,000,000	3,336,250
	DOST-PCAARRD-CvSU Agri-Aqua Technology Business Incubator Phase 2	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will be implemented for 2 years (January 1, 2021 - December 31, 2022) by Cavite State University in Indang, Cavite, with a total PCAARRD-GIA funding of Php 4,999,700.80. The CvSU Agriculture and Food Technology Business Incubation (AFTBI) will be part of the Philippine government's program in bringing scientific information and technologies closer to the community particularly Calabarzon region for agricultural development. The CvSU Agriculture and Food Technology Business Incubator aims to accelerate the successful development of entrepreneurs in the area through an array of business support resources and services. The CvSU-AFTBI focuses on three areas of business such as high value crop production, coffee production and food processing. AFTBI will assist the incubatees by providing them with farm lot, facilities, equipment and technical knowledge. Also, AFTBI will provide trainings and seminars about entrepreneurship, marketing and accounting to teach the incubatees how to operate a business.	1 ATBI business plan revised as needed 1 ATBI operations manual revised as needed At least 10 basic incubation curricula revised as needed At least 6 advanced incubation curricula developed At least 2 IEC or promotional materials for the ATBI developed At least 1 promotional video for the ATBI developed At least 16 IEC or promotional materials for the incubatees developed At least 2 promotional videos for the incubatees developed At least 10 trademarks filed At least 10 copyrights filed At least 10 technologies adopted by new incubatees At least 6 technologies adopted by continuing incubatees At least 3 technologies commercialized with issued Fairness Opinion Report At least 10 new incubatees enrolled to the basic incubation program At least 6 continuing incubatees enrolled to the advanced incubation program At least 6 continuing incubatees graduated from the advanced incubation program At least 6 startups or spinoffs registered and launched At least 6 trainings for the ATBI staff conducted or participated in At least 10 trainings for the incubatees conducted At least 10 business plans for the new incubatees developed At least 6 business plans for the continuing incubatees improved At least 4 awareness seminars or promotional activities conducted At least 4 business pitching events, industry meetups, or networking events conducted or participated in ATBI operations fully integrated to PCAARRD's ATBI real-time monitoring system At least 2 consortium member-agencies mentored on ATBI operations At least 10 MOAs/MOUs with the new incubatees forged At least 6 MOAs/MOUs with the continuing incubatees renewed At least 5 MOAs/MOUs with organizations from the public and private sectors forged/renewed At least 1 policy on ATBI institutionalized	CvSU	Smallholder farmers, Food processors, aspiring entrepreneur with no agricultural background, Faculty and Students, Employees or Businessman that was adversely affected by the pandemic	1-Feb-21	31-Jan-23	ONGOING	4,999,701	2,738,350
	DOST-PCAARRD-DMMMSU Agri-Aqua Technology Business Incubator Phase 2	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The DOST-PCAARRD-DMMMSU Agri-Aqua TBI Phase 2 project will be established in DMMMSU, Bacnotan, La Union as main office with three satellite stations at the College of Agriculture (Bacnotan, La Union), College of Fisheries (Sto.Tomas, La Union), and College of Agriculture (Rosario, La Union). The ATBI service offerings include basic/technical services such as lecture rooms, training rooms, conference rooms, product processing rooms, laboratory equipment, production farm, market space and technology support facilities. Moreover, this platform also offers business development such as access to professional services, networking for financial support, business planning, accounting and bookkeeping marketing, food testing and sensory evaluation, and trademark development and application.	1 ATBI business plan revised as needed 1 ATBI operations manual revised as needed - 1 ATBI operations manual revised as needed At least 5 ATBI basic incubation curricula revised as needed At least 5 ATBI basic incubation curricula revised as needed At least 10 ATBI basic incubation curricula revised as needed At least 6 ATBI advanced incubation curricula developed At least 6 ATBI advanced incubation curricula developed At least 1 IEC or promotional material for ATBI developed At least 1 IEC or promotional material for ATBI developed At least 2 IEC or promotional materials for ATBI developed At least 1 promotional video for ATBI developed At least 1 promotional video for ATBI updated At least 1 promotional video for ATBI developed and updated At least 11 IEC or promotional materials for incubatees developed At least 5 IEC or promotional materials for incubatees developed At least 16 IEC or promotional materials for incubatees developed At least 1 promotional video for incubatees developed At least 1 promotional video for incubatees developed At least 2 promotional videos for incubatees developed 1 ATBI sustainability plan revised as needed 1 ATBI sustainability plan revised as needed 1 ATBI communication plan developed and implemented 1 ATBI communication plan implemented 1 ATBI communication plan developed and implemented	DMMMSU	Private Individuals, Farmers, Fisherfolks, Students, Peoples Organization, Cooperatives, Technology generators from DMMMSU, and SME's	1-Jul-21	30-Jun-23	ONGOING	5,000,000	2,516,851
	DOST-PCAARRD-IFSU Agri-Aqua Technology Business Incubator	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The proposed IFSU-ATBI is composed of programs and process in-order to ensure the success of technologies in the market. The first two years of operations will be allotted for the development of programs and manuals of the IFSU-ATBI. In addition, building strong partnership with potential incubatees and linkages with industry partners is one of the objectives of this unit. The programs of the IFSU-ATBI will provide Technical assistance through a series of Agri-Aqua Technology Business Incubation processes to its potential incubatees to ensure the success of the technology and the entrepreneur in the market.Â Â Â Â	Publication: - 1 ATBI business plan developed - 1 ATBI operations manual developed - At least 10 ATBI curricula developed - At least 2 IEC or promotional materials for ATBI developed - At least 1 promotional video for ATBI developed - At least 10 IEC or promotional materials for incubatees developed - At least 2 promotional videos for incubatees developed - 1 ATBI sustainability plan developed and implemented - 1 ATBI communication plan developed and implementedPatent: - At least 10 Trademark filed - At least 5 Copyrights filedProduct: - At least 10 technologies adopted by incubateesPeople: Â¢â‚¬Â¢ At least 10 incubatees assistedÂ¢â‚¬Â¢ At least 6 trainings for ATBI staff conducted or participated inÂ¢â‚¬Â¢ At least 10 trainings for incubatees conductedÂ¢â‚¬Â¢ At least 10 business plans for incubatees developedÂ¢â‚¬Â¢ At least 3 awareness seminars or promotionalÃ¢Â activities conductedÂ¢â‚¬Â¢ At least 3 business pitching events, industry meetups, or networking events conducted or participated inÂ¢â‚¬Â¢ ATBI operations fully integrated to PCAARRD's ATBI real-time monitoring system Place: Â¢â‚¬Â¢ At least 10 MOAs/MOUs with incubatees forgedÂ¢â‚¬Â¢ At least 6 MOAs/MOUs with organizations from public and private sectors forgedPolicy: Â¢â‚¬Â¢ 1 ATBI institutionalizedÂ¢â‚¬Â¢ 1 ATBI-related policies of the University crafted and approved	IFSU	Technology and Business Incubator Office of IFSUTechnology Business Incubator personnel and managerIFSU Researchers/ InventorsTechnology adaptersEntrepreneurs	1-Nov-21	31-Oct-23	ONGOING	5,000,000	2,816,930
	DOST-PCAARRD-ISU Agri-Aqua Technology Business Incubator Phase 2	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will be implemented for 2 years (January 1, 2021 - December 31, 2022) by Isabela State University, with a total PCAARRD-GIA funding of Php 4,595,284.44. The present proposal was submitted to sustain the efforts of the incubator to transfer and commercialize agriculture-related technologies among MSMEs. Under this proposed initiative, the established incubator will continuously provide basic incubation program focusing on nurturing and counselling to the new incubatees. The program will be enhanced by providing advanced incubation program focusing on business growth for the continuing incubatees to get the enterprise/ start-up ready to scale-up.	1 ATBI business plan revised as needed 1 ATBI operations manual revised as needed At least 10 basic incubation curricula revised as needed At least 6 advanced incubation curricula developed At least 2 IEC or promotional material for the ATBI developed At least 1 promotional video for the ATBI developed At least 16 IEC or promotional materials for the incubatees developed At least 2 promotional video for the incubatees developed At least 10 trademarks filed At least 10 copyright filed At least 10 technologies adopted by new incubatees At least 6 technologies adopted by continuing incubatees At least 1 technology commercialized with issued Fairness Opinion Report At least 10 new incubatees enrolled to the basic incubation program At least 6 continuing incubatees enrolled to the advanced incubation program At least 6 continuing incubatees enrolled to the advanced incubation program At least 6 start-ups or spin-offs registered and launched At least 6 trainings for the ATBI staff conducted or participated in At least 10 trainings for the incubatees conducted At least 10 business plans for the new incubatees developed At least 6 business plans for the continuing incubatees improved At least 4 awareness seminars or promotional activities conducted At least 4 business pitching events, industry meetups, or networking events conducted or participated ATBI operations fully integrated to PCAARRD's ATBI real-monitoring system At least 2 consortium member-agency mentored on ATBI operations At least 10 MOAs/MOUs with the new incubatees forged At least 6 MOAs/MOUs with the continuing incubatees renewed At least 5 MOAs/MOUs with organizations from the public and private sectors forged/renewed At least 1 policy on ATBI institutionalized	ISU	Startups, spinoffs, farmers, fisherfolk, industry, general public, researchers/students, NGAs/NGOs	1-Jan-21	31-Dec-22	ONGOING	4,595,284	2,354,080
	DOST-PCAARRD-LSPU Agri-Aqua Technology Business Incubator Phase 2	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The DOST-PCAARRD-LSPU Agri-Aqua Technology Business Incubator (ATBI) is envisioned to be a center for development and advancement of sustainable agri-fishery and natural products industries in Laguna and nearby provinces through technology transfer, innovation, and technopreneurship. To achieve its vision, it hopes to provide an enabling environment to potential business start-ups in order to increase entrepreneurial and economic growth. This project has established an ATBI Base Hub in LSPU Siniloan Campus, with the aim of providing specialized services to technology developers/researchers, students, community people, and micro, small, and medium enterprises (MSMEs) by championing technology-based enterprises and foster the innovative and technopreneurial spirit. During its Phase 1, the Project has been funded by the DOST-PCAARRD-LSPU Fund of PhP 8,110,313.28.	1 Business Plan revised as needed 1 - 1 Page 3 of 4 1 ATBI operations manual revised as needed 10 ATBI basic incubation revised curricula 6 ATBI advanced incubation curricula developed 10 IEC or promotional materials for ATBI developed 1 promotional video for ATBI developed and updated 10 IEC or promotional materials for incubatees developed 2 promotional videos for incubatees developed 1 ATBI sustainability plan revised 1 ATBI communication plan developed and implemented 1 10 - 5 1 5 1 1 1 - - 6	LSPU	Filipino consumers, Incubatees, Partner Farms, Partner RDIs, other SUCs, LSPU faculty, support staff, students, and the ATBI Management Team	1-Jul-21	30-Jun-23	ONGOING	5,000,000	2,444,530

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
	DOST-PCAARRD-PSAU Agri-Aqua Technology Business Incubator	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project primarily aims to serve as an avenue where technologies developed in the University and other partner SUCs/RDIs are adopted and/or commercialized by enabling start-up business enterprises in the province. The role of the PSAU â€" Agri-Aqua Technology Business Incubation (ATBI) Office is to establish synergistic multi-sectoral relationship with the business and start-up communities, especially the micro-, small and medium enterprises (MSMEs) in order to accelerate the commercialization of university-made technologies. This project does so through the provision of various services to interested agricultural and aquaculture enterprises who are interested to be incubated.	1 ATBI business plan developedATBI operations manual developedAt least 10 ATBI curricula developedAt least 2 IEC or promotional materials for ATBI developed and disseminatedAt least 1 promotional video for ATBI developed and disseminatedAt least 10 IEC or promotional materials for incubatees developed and disseminatedAt least 2 promotional videos for incubatees developed1 ATBI sustainability plan developed and implemented1 ATBI communication plan developed and implemented1 semi-annual report prepared and submitted1 annual report prepared and submitted1 terminal report prepared and submitted1 list of technologies for incubation/ commercialization prepared/ published1 list of ATBI service offerings printed/publishedAt least 10 trademarks filedAt least 5 copyrights filedAt least 5 technologies commercialized with FOR and 5 extended/adoptedAt least 1-2 benchmarking activities conductedAt least 6 trainings/capacity building activities for ATBI staff conducted or participated inAt least 3 awareness seminars or promotional activities conductedAt least 10 incubatees assistedAt least 10 trainings for incubatees conductedAt least 10 business plans for incubatees developedAt least 3 business pitching event, industry meetup, or networking event conducted or participated inAt least 1 PSAU-ATBI Advisory Board formedATBI operations fully integrated to PCAARRDâ€™s ATBI real-time monitoring systemAt least 10 MOAs/MOUs with the incubatees forgedAt least 4 MOAs/MOUs with organizations from public and private sectors forgedATBI-related policies of the University crafted and approved1 ATBI organizational structure with terms of reference developedBaseline metrics to assess the social impact of ATBI to incubatees formulatedSocial impact of ATBI to each incubatee assessedInnovation ecosystem improvedContributed to the leveling of the UniversityBaseline metrics to assess the economic impact of ATBI to incubatees formulatedEconomic impact of ATBI to each incubatee assessedGross and net income generated by incubatees determinedJobs generated by incubatees determinedGross and net income generated by ATBI determinedJobs generated by ATBI determinedBusiness valuation of incubateesâ€™ start-up/spin-off companies determinedEconomic condition of the region improved	PSAU	PSAU ATBI PersonnelPSAU Researchers/InventorsAgri-aqua Incubatees (Entrepreneurs, Agripreneurs, Farm Owners, Farmers)	1-Nov-21	31-Oct-23	ONGOING	5,000,000	2,667,904
	DOST-PCAARRD-SKSU Agri-Aqua Technology Business Incubator Phase 2	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The SKSU Agri-Aqua Technology Business Incubator as the center for technology transfer, commercialization and business incubation in the University is constantly providing technical services to the incubatees in adopting the developed technologies. However, aside fro m the focused technologies for adoption in Phase I, there is still a need to enhance the incubator services by advancing the technologies and services provided to the existing incubatees and new start-ups/incubatees, spin-offs and micro and small entrepreneurs.	ATBI business plan revised as needed ¿ 1 ATBI operations manual revised as needed ¿ At least 10 ATBI basic incubation curricula revised as needed ¿ At least 6 ATBI advanced incubation curricula developed ¿ At least 2 IEC or promotional materials for ATBI developed ¿ At least 1 promotional video for ATBI developed and updated ¿ At least 16 IEC or promotional materials for incubatees developed ¿ At least 2 promotional videos for incubatees developed ¿ 1 ATBI sustainability plan revised as needed ¿ 1 ATBI communication plan developed and implemented At least 10 trademarks filed ¿ At least 10 copyrights filed ¿ At least 5 technologies adopted by new incubatees ¿ At least 6 technologies adopted by continuing incubatees ¿ At least 3 technologies commercialized with issued Fairness Opinion Report and signed Technology Licensing Agreement At least 10 new incubatees enrolled at basic incubation program ¿ At least 6 continuing incubatees enrolled at advanced incubation program ¿ At least 6 continuing incubatees graduated from advanced incubation program ¿ At least 6 startups or spinoffs registered and launched ¿ At least 6 trainings for ATBI staff conducted or participated in ¿ At least 10 trainings for incubatees conducted ¿ At least 10 business plans for new incubatees developed ¿ At least 6 business plans for continuing incubatees improved ¿ At least 4 awareness seminars or promotional activities conducted ¿ At least 4 business pitching events, industry meetups, or networking events conducted or participated in ¿ ATBI operations fully integrated to PCAARRD's ATBI real-time monitoring system ¿ At least 2 consortium member-agencies mentored on ATBI operations	SKSU	Start-ups, mirco and small enterprises	1-Jul-21	30-Jun-23	ONGOING	5,000,000	2,651,822
	DOST-PCAARRD-UPV Fisheries Technology Business Incubator Phase 2	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The Coastline 5023: DOST-PCAARRD-UPV Fisheries Technology Business Incubator (FTBI) is a technology transfer and commercialization support facility of the University of the Philippines Visayas (UPV). It aims to play a great part in the â€œThe Hub of Institutional Synergy, Innovation, Sustainability and Impact Translation (THIS IS IT)â€ agenda of UPV in the effort to translate, through technology-based enterprise development, the technologies and innovations generated under the College of Fisheries and Ocean Sciences and other colleges into products and services for the use and benefit of the greater society.	The expected outputs of the project are the following: A. Publications 1. 1 TBI business plan revised as needed; 2. 1 TBI operations manual revised as needed; 3. At least 1 incubation curriculum revised as needed; 4. At least 1 advanced incubation curriculum developed; 5. At least 21 IEC materials developed/revised and disseminated; 6. 2 semi-annual reports prepared and submitted; 7. 2 annual reports prepared and submitted; 8. 1 terminal report prepared and submitted; B. Patents 1. At least 2 copyrights registered; C. Products 1. At least 7 technologies commercialized/adopted for incubation; D. People and Services 1. At least 10 new incubatees enrolled to the incubation program; 2. At least 8 continuing incubatees enrolled to the advanced incubation program and launched as startup/spinoff; 3. At least 18 business plans of the incubatees developed/improved; 4. At least 8 continuing incubatees graduated from the advanced incubation program;	UPV	The beneficiaries of this project are the following: â€¢ UPV students and graduates â€¢ UPV faculty, researchers, and staff â€¢ Micro, small, and medium enterprises (MSMEs) â€¢ Farmers and fisherfolks â€¢ Local government units (LGUs)	1-Jan-20	31-Dec-21	ONGOING	4,999,922	2,079,603
	DOST-PCAARRD-USM Agri-Aqua Technology Business Incubator	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The DOST-PCAARRD-USM Agri-Aqua Technology Business Incubator or the USM SeedLink will serve as intermediary in transferring USM agri-aqua based technologies to farmers and fish-farm operators and in turn, secure market channels for produced products. Thus, the USM SeedLink will not only help improve the farmeraâ€™s production but also ensuring their income. In this manner, technology transfer operations in the University can be sustainable. The USM SeedLink will operationalize commercialization of research-based technologies to potential adaptors and target clients. The incubatees for agri-aqua startups will have the advantage because the USM SeedLink will provide assistance via training, business plan services, and business consultations in order to maximize income and manage enterprise effectively. This undertaking will provide incubatees the grounds for building their business thus very beneficial for potential entrepreneurs in the locality.	Publications - TBI business plan enhanced - TBI operations manual developed - At least 4 TBI curricula developed - At least 8 IEC and promotional materials developed - At least 2 promotional videos developed - 2 semi-annual reports prepared and submitted - 2 annual reports prepared and submitted - Terminal report prepared and submitted - List of technologies for incubation/commercialization prepared and promoted - List of TBI service offerings prepared and promoted - List of TBI service facilities prepared and promoted Patents - At least 2 trademarks filed - At least 10 copyrights filed Products - At least 4 technologies incubated/commercialized People and Services - At least 8 incubatees enrolled - At least 8 business plans for the incubatees developed - At least 4 trainings for the incubatees conducted - At least 5 startups or spinoffs registered and launched - At least 3 benchmarking activities conducted - At least 3 trainings for the project team conducted and participated in - At least 2 awareness seminars and promotional activities conducted	USM	Startups, spinoffs, farmers, fisherfolk, industry, general public, researchers/students, NGAs/NGOs	1-Mar-20	28-Feb-22	ONGOING	4,997,800	1,094,352
	DOST-PCAARRD-VSU Agri-Aqua Technology Business Incubator Phase 2	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will be implemented for 2 years (January 1, 2021 - December 31, 2022) by Visayas State University, Visca, Baybay City, Leyte, 6521, with a total PCAARRD-GIA funding of Php 4,950,000.00. The proposal is in line with effort of intensifying technology transfer by improving the present technology incubation program of the Visayas State University. The main feature of the proposal is the establishment and implementation of a Technology Business Acceleration Program at VSU side by side with the VSU Technology Business Incubation Program. Efforts will be exerted to expand the types of technology that will be enrolled to include not only those of food and agriculture, but also of engineering and ICT.	One (1) Manual of Operation of VSU-TBA Two (2) Utility Model Six (6) revised business plans Seed money for startups selected for acceleration. 160 hrs equivalent mentoring sessions Six (6) business development plans Six (6) on-line marketing platform Six (6) applications/proposals for NGAs â€" assistance programs Two (2) promotional AVP for accelerates Pool of mentors Six (6) trained/mentored startup entrepreneurs Two (2) pitching event conducted or participated One (1) Innovation and technology-based business acceleration hub Organizational structure Resolution by the VSU TBI/TBA Advisory Board on metrics to be used to assess the social and economic impact of the ATBI/TBA 1 ATBI revised business plan 1 ATBI revised operations manual Investment portfolio of Ten (10) technologies Six (6) trademarks filed Six (6) packaging designs 6 new incubates Two (2) boot camp At least 4 trainings for the ATBI staff conducted or participated At least 10 trainings for the incubates conducted Two (2) MOA with new partner forged Two (2) members of the consortia mentored on TBI operation	VSU	Start-up businesses (services or products) that had high potential to succeed and selected TBI phase I start-ups will be the target beneficiaries of the acceleration program	1-Apr-21	31-Mar-23	ONGOING	4,950,000	2,475,000

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
	DOST-PCAARRD-WMSU Agri-Aqua Technology Business Incubator Phase 2	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Lorem ipsum	Publications â€¢ 1 ATBI business plan revised as needed â€¢ 1 ATBI operations manual revised as needed â€¢ At least 10 ATBI basic incubation curricula revised as needed â€¢ At least 6 ATBI advanced incubation curricula developed â€¢ At least 2 IEC or promotional materials for ATBI developed â€¢ At least 1 promotional video for ATBI developed and updated â€¢ At least 16 IEC or promotional materials for incubatees developed â€¢ At least 2 promotional videos for incubatees developed â€¢ 1 ATBI sustainability plan revised as needed â€¢ 1 ATBI communication plan developed and implemented Patents â€¢ At least 10 trademarks filed â€¢ At least 10 copyrights filed Products â€¢ At least 10 technologies adopted by new incubatees â€¢ At least 6 technologies adopted by continuing incubatees â€¢ At least 3 technologies commercialized with issued Fairness Opinion Report and signed Technology Licensing Agreement People and Services â€¢ At least 10 new incubatees enrolled at basic incubation program â€¢ At least 6 continuing incubatees enrolled at advanced incubation program â€¢ At least 6 continuing incubatees graduated from advanced incubation program â€¢ At least 6 startups or spinoffs registered and launched â€¢ At least 6 trainings for ATBI staff conducted or participated in	WMSU	Startups, spinoffs, farmers, fisherfolk, industry, general public, researchers/students, NGAs/NGOs	1-May-21	30-Apr-23	ONGOING	4,998,355	2,422,121
	DOST-PCAARRD-WPU Agri-Aqua Technology Business Incubator Phase 2	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The goal is to establish the Western Philippines University-Technology Business Incubator (WPU-TBI) office in Puerto Princesa City campus where other government and private agencies that could be collaborators or future partners are at most accessible. The WPU-TBI will be the center for technology transfer and business incubation of technologies generated in the university. Specifically, it will provide technical services to advance incubatees for commercialization of mature technologies in the production of agriculture and aquatic species and products.	1 ATBI business plan revised as needed ¿ 1 ATBI operations manual revised as needed ¿ At least 10 ATBI basic incubation curricula revised as needed ¿ At least 6 ATBI advanced incubation curricula developed ¿ At least 2 IEC or promotional materials for ATBI developed ¿ At least 1 promotional video for ATBI developed and updated ¿ At least 16 IEC or promotional materials for incubatees developed ¿ At least 2 promotional videos for incubatees developed ¿ 1 ATBI sustainability plan revised as needed ¿ 1 ATBI communication plan developed and implemented At least 10 trademarks filed ¿ At least 10 copyrights filed At least 10 technologies adopted by new incubates ¿ At least 6 technologies adopted by continuing incubates ¿ At least 3 technologies commercialized with issued Fairness Opinion Report and signed Technology Licensing Agreement At least 10 new incubatees enrolled at basic incubation program ¿ At least 6 continuing incubatees enrolled at advanced incubation program ¿ At least 6 continuing incubatees graduated from advanced incubation program ¿ At least 6 startups or spinoffs registered and launched ¿ At least 6 trainings for ATBI staff conducted or participated in ¿ At least 10 trainings for incubatees conducted ¿ At least 10 business plans for new incubatees developed ¿ At least 6 business plans for continuing incubatees improved ¿ At least 4 awareness seminars or promotional activities conducted ¿ At least 4 business pitching events, industry meetups, or networking events conducted or participated in ¿ ATBI operations fully integrated to PCAARRD's ATBI real-time monitoring system At least 10 MOAs/MOUs with new incubatees forged	WPU	Existing and future incubates Technology and Business Development Office of WPU Technology Business Incubator personnel and manager WPU Researchers/Inventors Technology adapters	1-Jul-21	30-Jun-23	ONGOING	5,000,000	2,759,366
	Enhancing the Adoption and Transfer of the Phenology-based bamboo mapping technology and GIS-based suitability mapping of potential areas suitable for commercial bamboo in selected areas in the Philippines (Enhancing the Capabilities of DENR Field Offices on Phenology-based Bamboo Mapping Technology and GIS-based Mapping of Areas Suitable for Commercial Bamboo Production)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will be implemented for one and a half year (1.5 years) by DENR-ERDB in collaboration with Asian Institute of Technology, Pathum Thani, Thailand, with a total PCAARRD-GIA funding of PhP4,057,872.00. This project hopesÂ to cascade the state-of-the-art technologies like phenology-based bamboo mapping and GIS-based suitability mapping techniquesÂ to the regional and other frontline units of the DENR, particularly the PENROs and CENROs, and those persons and agencies in the DENR involved in bamboo resources monitoring and management in order to equip them with scientific tools that will serve as basis for better management option and quick decision-making. Specifically, it aims to: (1) familiarise selected DENR Field Offices on phenology-based mapping technology for possible sustained implementation; (2) To facilitate the transfer of GIS-based suitability mapping technology for bamboo; andÂ (3)to generate GIS-based maps of areas suitable for commercial bamboo plantation.Â Â	¿ At least 6 MOAs/MOUs with continuing incubatees renewed People and Services â€¢ 100 DENR field staff trained â€¢ 6 trainings conducted Publications â€¢ 1 journal paper submitted for publication â€¢ 3 modules prepared â€¢ 3 IEC materials produced	ERDB	DENR technical field personnelCommunity based farms on bamboo8Bamboo growers and processors Industry (traders, retailers) National government agencies Non-governmental organizations	1-Sep-21	28-Feb-23	ONGOING	2,815,248	2,815,248
	Establishment of a Pilot Plant for Acticon – A Biocontrol Solution Against Fusarium oxysporum TR4	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Lorem Ipsum	Publication: N/APatent: Patents already applied by UPLBProduct: Commercial ACTICon product in market and commercial facility The pilot plant is designed to have an annual operating capacity of 36,000L or 3,000L per month. Based on this, the cost to produce 1L of ACTIConÃ¿Â including the Royalty to be given to UPLB amounts to P164.34. To breakeven, the pilot plant must produce around 774.04L of ACTICon per month or about 9,288.45L per year.People: 4 staff employed by Y1, Q11 fieldPlace: 1 field trial and 1 distribution partner by Y1,Q1 and Y1,Q4Policy: N/A	EBiTech Inc.	ACTICon will greatly impact the banana industry. Currently, measures against the Panama Disease compose of cultural management practices and chemical control Ã¢Â¬Â¢a which are expensive and not environmentally sound. With ACTICon, there is also no need to abandon the land, saving up to 1.2 million pesos per hectare in export revenue and up to 500,000 pesos per hectare in new farm development cost. The product will be beneficial to all players in the banana industry, from small farmers to large plantations, in inhibiting the infection and spread of the disease.	16-Dec-21	15-Dec-22	ONGOING	4,940,018	4,192,509
	Establishment of Food Processing Facility for Sustainable Commercialization Chevon-based Technologies	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Lorep Ipsum	Publication: 1Ã¿Â GMP and HACCP manual 4 IEC materials- Product Catalog 2 Promotional VideosÃ¿Â Patent: 6Ã¿Â Utility Model ApplicationsProduct: 4Ã¿Â Chevon products commercializedÃ¿Â People: 4 People employed in the business 3Ã¿Â Supermarket/product outlet assisted Ã¿Â Ã¿Â Place: 1Ã¿Â Facility established 2Ã¿Â Contract growing agreement signed 1Ã¿Â Signed Distribution Partnership AgreementÃ¿Â Ã¿Policy: 1 Policy on goat contract growing scheme presented to industry keyplayersÃ¿Â	ABFC	1. Goat raisers 2. Chevon consumers 3. Goat Industry	16-Dec-21	15-Dec-22	ONGOING	3,927,400	3,927,400
	Establishment of Off-Campus Integrated Diversified Farming System (IDFS) Demonstration, Production, and Experimental Areas	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project incorporates key strategies of integrated diversified farming system (IDFS) and CVSU's generated technologies such as coffee, dragon fruit, and banana (lakatan) production technology.	Publication: 1 Education and Communication (IEC) and promotional materials developed/produced 1 Business plan prepared/ updated 1 sustainability plan developed Patent: 2Copyrights filed for the developed IEC materials, videos and websites Product: 1 Promotional video developed for the enterprise 6 demonstration and/ or experimental areas established 3 technologies/ S&T interventions implemented People: 1 farm enterprise supported/mentored 20 trained personnel 10 trainings conducted for farm enterprises 4 consultation meetings conducted 1 benchmarking activity conducted Place: 1 linkage and partnership forged	CvSU	Casa Bella Farm Farm owners and manager Farm workers/ laborers	1-Nov-21	31-Oct-23	ONGOING	5,000,000	3,155,200
	Implementation of S&T-based Climate-Smart Soil and Water Management in the Highlands of Maguindanao	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will be implemented for two (2) years by Mindanao State University - Maguindanao. The project site is located at Datu Odin, Maguindanao with a total PCAARRD-GIA funding of PhP 5,776,057.60. It generally aims to build and strengthen the resiliency of upland farming systems to adapt to climate change thereby decreasing the vulnerability to the negative effects of decreasing water resources and increasing soil degradation. Specifically, the project will focus on:Promoting climate-adaptive soil and water management options in highland agriculture;Building the capacity of Mindanao highland farmers in adopting climate-smart technologies;Establishing S&T community-based climate-smart highland farm;Recommending climate adaptation measures to address water scarcity; andDeveloping knowledge products on climate-smart soil and water management in highlands.	People and Services 5 farmer organizations trained5 trainings conducted for highland farmers2 consultation meetings conducted2 experts â€™ pool maintainedPublications 2 papers submitted to a peer-reviewed Journal1 Technical Report 1 brochure on climate-adaptive soil and water management for highlands1 Guidance Manual on climate-smart highland agriculture2 IEC materials on soil and water management for highlands Patents/IPS Copyrights filedPlaces and Partnerships 4 linkages and partnerships with DENR, DA, DOST, and private sectorsPolicies 1 policy brief for input to relevant agenciesProducts2 KP developed1 demonstration farm 	MSU-Maguindanao	Highland farmersMSU-Maguindanao and the scientific communityLocal government unitsNational government agencies	1-Sep-21	31-Aug-23	ONGOING	4,996,058	3,068,029
	Levelling-Up of Innovative Agriculture, Aquatic, and Natural Resources-based Startups/Spinoffs thru Promotion, Assistance, and Development (LIPAD) Project	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Lorem ipsum	Publication: Year 1 Year 2 Total At least 7 marketing collaterals (brochures, flyers, primers, poster, pamphlets) At least 7 videos created for press releases, news and featured articles (tri-media, social media) 28 quarterly mentoring reports (7 startups/spinoffs x 4 quarters) 1 Proceeding for the Investment Forum At least 9 marketing collaterals (brochures, flyers, primers, poster, pamphlets) At least 9 videos created for press releases, news and featured articles (tri-media, social media) 36 quarterly mentoring reports (9 startups/spinoffs x 4 quarters) 1 Proceeding for the Investment Forum At least 16 marketing collaterals (brochures, flyers, primers, poster, pamphlets) At least 16 videos created for press releases, news and featured articles (tri-media, social media) 64 quarterly mentoring reports (16 startups/spinoffs x 4 quarters) 2 Proceedings for the Investment Forum	UPD	The target benefeciaries of this proposal project are sixteen (16) AANR-based startups and spinoffs.	16-Dec-21	15-Dec-23	ONGOING	7,152,155	3,748,578

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
	Mainstreaming of Bamboost App as an Online Marketing Platform of Bamboo Farmers in Select Science &Technology Community-Based Farms (STCBF)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	There is a renewed interest now on bamboo in the Philippines. Recently declared as a high-value crop, the ubiquitous bamboo has significant potential to create employment and thereby reduce poverty particularly in the countryside. However, bamboo supply chains are plagued with various challenges. According to the bamboo supply chain analysis conducted by Aquino et al. (2015), the absence of market information is the essential problem confronting the industry. Consequently, this resulted to weak integration of operational relationships among economic actors in the bamboo supply chain. The report also revealed that bamboo farmers lack adequate information on the location of suppliers and what specific requirements like in terms of pole characteristics, volume and species of bamboo they need. On the other hand, farmers are unaware of the bamboo pole characteristics and quality needs of customers, forcing them to depend on the pole agents who dictate price and get much of the market margin.In order to address these gaps, this project aims to mainstream Bamboost Mobile App as an online marketing platform in selected STCBF sites and bamboo farming communities in the country Bamboost App was purposely developed for the thesis study of Ms. Analiza C. Diaz during her MS in AIT. The beta version of Bamboost App was demonstrated and presented to the bamboo growers and processors of Maasin, Iloilo, and the factors affecting their willingness to adopt it in marketing their bamboo products were analysed. With the positive outcome from the willingness to adopt thesis/research, this project is proposed as a second phase.The project will be jointly implemented by the University of Science and Technology of Southern Philippines and TTPD-CPAARRD, in collaboration with the Asian Institute of Technology, for 1/5 years (September 2021 to February 2023 with a total budget (PCAARRD-GIA) of PhP 4,996,013.00.	People and Services â€Â Â Â Â Â 200 farm enterprises supported â€Â Â Â Â Â 5 bamboo processors supported â€Â Â Â Â Â 200 farmers trained â€Â Â Â Â Â 30 processors trained â€Â Â Â Â Â 200 bamboo MSMEs supported â€Â Â Â Â Â 4 trainings conducted for farm enterprises â€Â Â Â Â Â 6 consultation meetings conducted â€Â Â Â Â Â 2 benchmarking activities conducted â€Â Â Â Â Â 2 experts â€™ pool maintained	USTP-Cagayan de Oro	Bamboo farmers/processors,Â community-based farms on bamboo, industry (traders, retailers), bamboos MSMEs, general public/consumers. LGUS, NGOs	1-Sep-21	28-Feb-23	ONGOING	4,996,013	3,409,009
	Performance Assessment of PCAARRD Technology Transfer Modalities	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The findings of this project will help in the various policy responses to encourage the use of technology transfer modalities and other improved technologies to reverse the slide in agricultural productivity and help boost production and enhance food security. Further, the knowledge to be generated from the project will be utilized to recommend policy redesign scaling-out of technology transfer activities in terms of enhanced adoption and diffusion of in the different regions of the country.	ProductsTwenty-seven (27) technology transfer projects documented, analyzed, processed & results summarizedList of potential adopters and partnersPublicationOne IEC of completed technology transfer projectsOne AVP on successful technology transfer projectsOne (1) publishable article on successful PCAARRD technology transfer projectsPolicyOne (1) policy recommendation on technology transfer implementation	BSU	PCAARRD and NAARRDN	1-Aug-20	30-Apr-22	ONGOING	5,000,000	1,500,000
	Phase 2: Management and Commercialization of Technologies Generated from PCAARRD-funded Research Projects in UPLB	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The Phase 2 project is a two-year undertaking which aims to continue and enhance/expand the efforts ofthe UPLB-TTBDO on the management and commercialization of technologies generated from PCAARRD-funded projects. This project will also focus on the monitoring and evaluation of the approved licensing deals achieved in Phase 1 by tracking the activities conducted by the licensees. Phase 2 will also enable the UPLB-TTBDO to conduct new activities that will support the IP management and commercialization efforts of the University, such as the creation of IP management plans, financial and investment analysis, and IP prosecution and maintenance. The actual experiences from the Phase 1 project will also serve as basis for exploring new approaches to achieve a more effective IP management and commercialization system at UPLB. Moreover, the proposed activities in Phase 2 will cover technologies identified in Phase 1 as well as those that will be audited encompassing R&D projects implemented from 2016 to 2021. The Phase 2 project will be of service to university researchers, students and staff, as well as to the external agencies/individuals who would like to seek assistance in terms of IP management and technology commercialization. The Phase 2 project will be implemented at the UPLBTTBDO located at the Science and Technology Park of UPLB.	The following are the target deliverables of the proposed project in its two-year duration: Stage 1. Capacity Building and Provision of Technical Assistance â€ Capacity building activities through IP management and technology commercialization trainings for: o 8 Internal activities conducted for UPLB researchers and staff o 10 Consultations and technical assistance provided to external agencies/individuals/partners Stage 2. Policy Development â€ Packaging and formalization of internal policies developed in Phase 1 for dissemination to the university constituents and stakeholders o 1 Compendium of policies â€ IEC materials on policies developed, printed and disseminated o 1 Compendium of policies printed and copies disseminated	UPLB	1. University Researchers, Students and Staff 2. Industry Partners and Collaborators 3. Agriculture Sector, Aquatic, and Natural Resources (AANR) Sector	1-Mar-19	31-May-21	COMPLETED	4,995,180	1,222,782
	Promotion of Aquashade Technology in Luzon to Increase Nile Tilapia Seed Production During Warm Months (Old Title: S&T Promotion of Aquashade Technology: Solution to the Low Nile Tilapia Seed Production during Warm Months)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project will involve an interdisciplinary team who will work for wider adoption of the technology in Luzon where most of the tilapia hatcheries are located. The dissemination of technology will be in collaboration with other SUCs and LGUs that will result in increased seed production in their respective areas which is highly needed for increased growout production.	Publication: ¡ 2 IEC materials developed, translated and distributed ¡ 1 AVP produced Patent: 2 publications with copyright Products: 5 aquashade technologies installed in tilapia hatcheries that will serve as a model in Luzon People and Services: ¡ 5 seminars/trainings conducted on aquashade technology and latest technologies on tilapia seed production and hatchery management ¡ 5 tilapia hatchery operators identified as model for aquashade technology ¡ At least 50 tilapia hatchery operators trained Places and Partnership: ¡ 4 MOAs/MOUs signed (1 per SUC) ¡ 5 MOAs signed with hatchery operators ¡ Established linkages with the following: ¡ 5 Hatchery operators i 4 SUCs i At least 5 LGUs Policies: 1 guideline developed in using the aquashade technology for tilapia seed production	CLSU	Tilapia hatchery operators in Luzon (Bataan, Nueva Ecija, Tarlac, Isabela, Region 4, Region 5)	1-Jul-19	30-Nov-21	COMPLETED	4,932,944	754,315
	S&S Plaza Goes SciCAT Phase 2: Promotion of Ecologically Viable Farming Practices and Generated Technologies Through Blended eAgri-tourism Under the New Normal	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will be implemented for 2 years (January 1, 2021 - December 31, 2022) by the Bureau of Plant Industry â€ Los BaÃ±os National Crop Research and Production Support Center (BPI-LBNCRDPSC) in Los Banos, Laguna, with a total PCAARRD-GIA funding of Php 4,999,924.80. It generally aims to promote ecologically viable farming practices and generated technologies through a blended eAgri-tourism approach under the new normal. Specifically, the project will focus on showcasing farming practices and technologies not only for technology promotion but also to capacitate other BPI-LBNCRDPSCâ€™s personnel, Local Government Unit (LGU) partners, and technology adopters who can function as an extension of the S&S Plaza in disseminating the different farming practices and technologies promoted by the Plaza.	People and Services 500 Trained farm owners/farming enthusiasts 8 Conducted webinars 40 POT adopters 50 monthly average No. of engagements on social media sites (i.e. likes, shares, comments, inquiries) Products 8 New POTs downloaded 2 Value-adding/processing of existing farm produce Produced 200kg leafy vegetables Production of 5,850 pcs quality planting materials Publications 10 IEC materials (brochures, leaflets or posters & videos for social media) 10 Training modules prepared Patents 10 Copyrights (from IEC materials) Places and partnerships 8 MOA forged 4 MLGU and DOT partnerships	BPI-LBNCRDPSC	Farmers, farm entrepreneurs, private and government agencies/organizations, LGUs, SUCs, students, farming enthusiast and farm visitors	1-Jan-21	31-Dec-22	ONGOING	4,999,925	2,711,962
	S&T Action Frontline Emergencies (SAFE) for Forest Fire Hazard in the Watersheds in Bokod and Tublay, Benguet Province using Maguey (Agave cantala) as Greenbelt (S&T Action Frontline Emergencies (SAFE) for Forest Fire Hazard in the Watersheds using Maguey as Greenbelt in the Province of Benguet and Mountain Province, CAR)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The establishment of greenbelt is one of the promising technologies feasible to minimize or control forest fire in watersheds in CAR specifically in the Province of Benguet which is prone to fire hazards due to the forest fires. Penafiel (1990) identified and tested species for greenbelt establishment. Maguey (Agave cantala) is one of the species suitable in Benguet Province. This has thick evergreen plants which cannot be easily burned. This crop has evolved traits including crassulacean acid metabolism (CAM) that allows them to survive environmental stress even under extreme heat and drought. It can be grown in a range of tropical climates, with an annual rainfall up to 2500 mm, but it grows best in a semi-arid tropical climate. The plant can be propagated vegetatively by means of suckers or bulbils. This was brought by the Spanish from Mexico to the Philippines, Indonesia and Malaysia, where it later evolved into a fiber crop. Maguey was planted initially in some areas as a hedge to control soil erosion and fence plant. Cantala fiber is made into baskets, hammocks, bags, sandals, carpets, rugs, doormats, sacks and cordage, of which binder twine is the most important.	YEAR 1 Products â€Two (2) maguey nurseries established â€11,264 suckers/bulbils produced and planted â€2.56 km greenbelts established People and Services â€Twenty (20) farmers empowered on climate change and greenbelt establishment using maguey for forest fire â€Fourteen (14) LGU officials trained Places and Partnerships â€Two (2) MOAs forged for forest fire hazard protection and greenbelt sustainability â€Two (2) barangay partners in greenbelt establishment â€Two (2) SPAs protected from forest fires Publication â€One (1) manual produced (How to Establish Greenbelt Using Maguey) â€One (1) poster produced (Greenbelt Establishment) â€One (1) flyer produced (Greenbelt Establishment) YEAR 2 Products â€11,264 suckers/bulbils produced and planted â€2.56 km greenbelts established People and Services â€Twenty (20) farmers empowered on climate change and greenbelt establishment using maguey	ERDB	Municipal and Barangay Local Government Units (BLGU) of Bobok, Bokod and Dadian in Tublay, Benguet	1-Apr-21	31-Mar-24	ONGOING	4,999,618	2,159,532
	S&T Community-based Bamboo Nursery and Plantation for Pole Production in Iligan City (Old Title: Establishment of a Smart Community Based Bamboo Nursery and Plantation for Pole Production in Iligan City)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	For the past 10 years, the Bamboo Technology Resource Center of MSU â€ Iligan Institute of Technology has been extending technical assistance and has provided skills trainings in handicraft making, housewares products, finishing techniques, bamboo charcoal production to these aforementioned barangays, the CARAGA region and some municipalities of the Autonomous Region of Muslim Mindanao (ARMM). The LGU of Iligan is one of the cities in the Philippines that has created its own local bamboo council and has strived to strengthen the industry by giving a seed fund (20% City Development Plan). The city in partnership with the Department of Trade and Industry has conducted a value chain mapping activity to determine gaps in the local bamboo industry in Iligan City. One major constraint identified is the lack of bamboo pole supply and no established bamboo nursery and plantation. Moreover, Region 10 where Iligan City belongs has the highest number of Shared Service Facility (SSF) totaling 21 bamboo hubs and nodes. Of these, Iligan City has 3 engineered bamboo producers and 2 bamboo slats processors. A single producer has a production capacity of 25 square meter monthly. The project on bamboo nursery and plantation is proposed to fill in the gaps identified in the bamboo value chain specifically, the lack/inadequate supply of bamboo poles and the absence of bamboo nurseries and plantation through the STCBF modality. One of the goals stipulated in the Philippines Bamboo Industry Roadmap 2016-2040 and PCAARRD's bamboo ISP is to increase hectares of bamboo plantation to increase pole production in order to meet the demands and growing utilization of bamboo and the bamboo based industry. The community-based project on bamboo nursery and plantation for pole production will employ smart or precision farming approach with five major components: 1) organization and capability building of farmer clusters; 2) rehabilitation of bamboo clumps of Kawayan tinik (Bambusa blumeana), Bontong (Gigantochloa levis) and Giant Bamboo (Dendrocalamus asper); 3) bamboo nursery establishment; 4) bamboo plantation establishment; and 5) harvesting and postâ€"harvest treatment.	Products30,000 bamboo propagules produced4,000 bamboo propagules planted and grown350 clumps of kawayang tink, 350 clumps of bontong and 350 clumps of Giant bamboo rehabilitatedPeople and Servicesproduced business plan and sustainability plan70 farmer cooperators per barangay trained1 farmer field day conductedPublicationTechno guides on kawayang tink and bontong production producedPlaces and Partnershipsforged 3 MOA/MOUsPoliciesat least 1 policy recommendation developed	MSU-IIT	Bamboo farmers, engineered bamboo and GDH manufacturers and producers, bamboo entrepreneurs	1-Aug-19	31-Jul-22	ONGOING	4,990,000	795,190
	S&T Community-Based Farm (STCBF) on Enhancing Coffee Production in Sultan Kudarat	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will be implemented in the three major coffee producing municipalities of Sultan Kudarat namely Sen. Ninoy Aquino, Kalamansig & Lebak. The project has a goal to increase coffee productivity of the farmer-participants in the project sites from 0.5-ton green beans to 1.5 tons green beans per hectare through STCBF technology transfer modality within the project duration. This involves the introduction of key technologies in the whole coffee production chain (such as selection and use of high yielding clone, rejuvenation of old unproductive trees then proper fertilization of coffee farms and provision of all-weather dryer) that will ensure high productivity of coffee farms and improved quality of coffee beans. These technologies should fill up the critical S & T gaps in the production operations of coffee farmers in Sultan Kudarat Province as well as in most coffee growing areas in the country.	Products40,000 rooted coffee seedlings (Arabica and Robusta) producedPeople and Services1 clonal garden and nursery established3 groups of farmer cooperators (w/20 farmers per group) organized and trained27 trainings (3 trainings per site, 3 batches) conductedPlaces and Partnerships7 MOAs (Between SKSU and 4 farmer cooperators and 3 LGUs) signedLinkages with 1 PELGUs and 3 MLGUs, Peoples Organization, DTI, DOST R12, and NESTLE sustainedPublications2 IEC materials produced, distributed and reprinted2 training modules1 video clip1 coffee manualPoliciesProposed/draft a policy on intensive promotion of GAP in coffee (ie. Coffee Festival) and local land usePatentsApplied 5 copyrights	SKSU	Coffee farmers	1-Jun-20	31-May-23	ONGOING	9,143,527	2,661,509
	S&T Community-based Gmelina Farms in the Province of Isabela	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The establishment of the STCBF will serve as a model for the establishment of ITP in Region 2 with Yemane (Gmelina arborea) as main commodity. It aims to increase the income of farmers as sources of Gmelina raw materials for the furniture industry in the region.	Products10,000 seedlings of quality planting materials from genetically superior Gmelina produced People ad Services30 tree farmers in Isabela identified and capacitated 8 trainings conductedPlaces and PartnershipsS MOAs with partner agencies signed PublicationsS IEC materials produced1 publishable article on the profitability of Gmelina-based agroforestry systemsPoliciesProvided policy inputs/recommendations on the use of genetically superior seeds of Gmelina in R2	ISU	Tree farmers in Cabagan and Mallig, Isabela	1-Aug-19	31-Jul-22	ONGOING	4,998,834	123,051

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
	S&T Community-based Nursery, Plantation and Seedling-Seed Orchard (SSO) Establishment and Management of Falcata (Falcataria moluccana) in Tagbalili, Esperanza, Agusan Del Sur	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Caraga Region has a total land area of 1,913,842 hectares, with a total forestland area of 1,331,491 hectares of which 999,705 or about 75% are classified as production forest. With this, tree farming has been a way of life of the Caraganons. The Philippine Forestry Statistics shows that majority of the log requirement of the country are being supplied by Caraga Region, hence dubbed as the Timber Corridor in the southern Philippines. Owed to its vast area of land, favorable climatic condition, social and economic appreciation and acceptance of tree farming and available wood-based industries and market, it is projected that more falcata plantations will be established and demand for planting materials is expected to rise. Carandang (2011) mentioned that tree farming provides plenty of livelihood opportunities for local people, from seedling production to planting, maintenance, harvesting, and marketing activities that entail hiring of local labor. Even the communities dependent on traditional forestry benefit from employment in these tree farms as part time labor during peak labor seasons of maintenance and harvesting. He further cited that tree farming and high value forest plantations seem to offer the best prospects of generating real livelihoods for people from forestry (Brown, 2011, comments). It is important, however, for the government to address many constraints in this respect (e.g., policy, social, environmental, etc.). The operationalization of the Mindanao Tree Seed Center of DENR with funding support from DOST-PCAARD already established system in the selection, collection, processing and recording of tree seeds from quality sources especially Falcata which is the major tree species planted by farmers in the region. Through the Forest and Wetland Research, Development and Extension Center (FWRDEC), improved seeds have been disposed to tree farmers as a strategy to improve productivity and profitability of established plantations. There is a great need to support farmers using community-based approach. The Community-based S&T-based Farms as a technotransfer modality will assist the nursery growers and tree farmers in building strong and unified alliance towards supporting the wood-based needs. With the existence of the MTSC facility and the availability of information, technologies and good quality seeds, improved productivity and profitability ensuring stable supply of raw materials for wood production can be made realized through convergence of potential partner agencies and other entities. One (1) community-based Tree Nursery, one (1) 1-hectare model Farm and one (1) 1-hectare seedling-seed orchard of Falcata will be established in Tagbalili, Esperanza in Agusan del Sur. A total of 25 tree farmers will be selected from the participating farmers of the Provincial LGU-led â€œSmall-scale Falcata Production Projectâ€ of the Upland Sustainable Agriforestry Development. These farmers will be trained and the project will served as a pilot-demonstration to other tree nursery growers and farmers as well which will showcase application of different S&T-based technologies in the production and management of nursery and plantation. The need to	Products:30,000 Seedlings produced from selected sourcesPeople and Services1 S&T community-based farm with expansion1 SSO established1 farmer group with 30 farmer cooperators organized30 farmer cooperators capabilities enhanced1 farmers' field day conductedPublication1 Techno guide package1 documentary video producedPlaces and Partnerships1 MOA forgedPolicies1 provided policy inputs	ERDB	Tree farmers in Tagbalili, Esperanza, Agusan del	1-Jul-19	30-Jun-22	ONGOING	4,998,854	2,041,415
	S&T Community-based Nursery, Plantation Establishment and Management of Giant Bamboo (Dendrocalamus asper, Schult Backer) in Dalwangan, Malaybalay City, Bukidnon	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Bamboo is one of the fastest-growing and highest yielding renewables and at the same time is a highly versatile natural resource. In the Philippines, bamboos are intertwined with our environment, economy, and culture. They are used in construction, furniture, and handicraft manufacture. The Philippines ranks 5th in the world as the largest exporter of bamboo products and because of its many uses, bamboos have been popularly used by many communities. Investors are coming to the country with a very promising livelihood opportunity for the people. Although bamboo is abundant in the country, the existing resource cannot cope up with the demands of these investors both in the quality and quantity of the resources. The Philippine Bamboo Foundation reported that up to 52,000 hectares of land in the country are planted with bamboo but this could not meet the increasing market demand. As of 2010, the market needs 575,000 handicraft poles and 3.5 million furniture poles. Giant bamboo (Dendrocalamus asper) is among the ten commercially-important bamboo species identified by the Philippine Bamboo Industry. It is a very large, dense-clumping, evergreen species native to Southeast Asia. It grows up to 20 m tall and 12 cm in diameter. Younger plants are covered with fine velvety brown hairs. It is widely cultivated for its highly valued culms that are used as a building material and its shoots that are used as a vegetable. Upper internodes of the culm are used as containers for water or to collect juice being tapped from palm inflorescence. In Bukidnon, these are used as tomato stakes, poultry floors, and in making engineered bamboo products. Moreover, PCAARRD has identified improved nursery, plantation, and post-harvest management practices for bamboo as one of the important technologies in their Industry Strategic Science and Technology Plans (ISPs). Also, the Farm and Industry Encounter through the Science and Technology Agenda (FIESTA) conducted last 2018 highlighted bamboo production as one of the technologies for extension/adoption. This has increased the interest of the farmers because of the promising benefits they will gain from this commodity. Thus, there is a need to focus on S & T activities to support the development of the Philippine Bamboo Industry through a community-based approach. The S & T Community-based Nursery and Plantations as a techno-transfer modality will assist the bamboo nursery growers and plantation farmers in building a strong and unified alliance towards supporting the bamboo industry. With the availability of information, technologies, and existing healthy bamboo stands improved productivity and profitability ensuring a stable supply of raw materials for the bamboo-based industry can be realized through the convergence of potential partner agencies and other entities.	Products â€¢25,000 planting materials from selected bamboo stands in the established S&T community-based bamboo nursery producer â€¢ 80 bamboo shoots from 10 established demonstration plots producer People and Services â€¢ 1 S&T community-based bamboo nursery established â€¢ 3-ha S&TCB bamboo demo plantation established â€¢ 15 1-ha S&T community-based bamboo expansion plantation establish â€¢ value added products for bamboo shoots(food processed bamboo shoots) â€¢ 1 farmer group with at least 15 cooperators organized â€¢2 capacity building and capacitated 45 bamboo farmers conducted â€¢ 1 Farmer's Forum on Bamboo-Industry Development to be attended by 70 participants conducted Publications â€¢1 technology guide on Bamboo Planting, Harvesting, and Processing and produced 100 copies for distribution packaged â€¢ produced 1 documentary video material highlighting the STCBf modalityPlaces and Partnerships â€¢ 1 MOA with project partners forged Policies â€¢ 1 policy recommendation to the LGU to intensify the support to bamboo related activities drafted Patents â€¢ Copyright of the technology guide filed/registered	ERDB	Bamboo growers in Dalwangan, Malaybalay City, Bukidnon	1-Mar-21	28-Feb-24	ONGOING	4,999,998	2,165,028
	Safety Assessment and Determination of Wine-Property Enhancing Compounds of Wines Aged in FPRDI Toasted Wine Barrel (Old Title: Sub-Chronic Toxicity of Wines Aged in FPRDI Toasted Wine Barrels and Determination of the Wine-Properties Enhancing Compounds)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will be implemented for 8 months (February 1, 2021 â€" September 30, 2021) by Forest Products Research and Development Institute in Narra St., Forestry Campus, UPLB, Laguna with a total PCAARRD-GIA funding of Php 2,613,138.40. The project aims to improve the quality and taste of the wine of our local fruit winemakers, DOST-FPRDI initiated to produce locally made wine barrels. At present, it is already the pre-commercialization stage with a project title â€œPiloting of the FPRDI Wine Barrel Technology â€ funded by DOST-TAPI and DOST-PCAARRD with the Technology Transfer and Promotion Division (TTPD) as monitoring Division. These wine barrels are made from locally available semile santol [Sandoricumkoisjape (Burmal f.] and fruit trees and tree plantation species: big leafed mahogany (Swietenia macrophylla King), mangium (Acacia mangium), and river red gum (Eucalyptus camaldulensis).	-Atleast 1 research paper on the safety of wines aged from FPRDI wine barrels and profile of wine-properties enhancing compounds -2 fruit wines (Bignay and Mango); 4 Toasted wine barrels (Acacia mangium, Eucalyptus camaldulensis, Sandoricum koijape (maho	FPRDI	Wine industry, other industries that have products which can be aged in wooden barrels, barrel fabricator/s, wine consumers	16-Jun-21	15-Feb-22	ONGOING	2,613,138	2,613,138
	SciCAT AGRI-VIDA: A project on the Advancement and Generation of Robus source of Income through Value-added Innovations and continual Dissemination of Agri-technologies towards sustainable Farm Tourism	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will be implemented for 2 years (January 1, 2021 - December 31, 2022) by the University of Southeastern Philippines (USeP) in Banay-banay, Davao Oriental, with a total PCAARRD-GIA funding of Php 4,985,048.00. It generally aims to provide more sustainable opportunities to Dimpas Farm and other farm tourism sites and farming enthusiasts towards the advancement and generation of robust sources of income through value-added innovations and continued dissemination of science-based farm technologies including post-harvest handling and processing. Specifically, the project will focus on generating a strong and sustainable source of income thru value-adding so that more farming enthusiasts will replicate this modality and adopt POTs being introduced on the farm. Collaboration and linkages for the MS farm to various farm tourism sites, food processors, entrepreneurs, and agencies from public and private entities will also be facilitated to ensure inclusive and holistic growth.	People and Services 500 Trained farm owners/farming enthusiasts 8 Conducted series of webinars 5 No. of actual/ face-to- face trainings conducted 400 No. of farm visitors/ viewers per virtual tour (100/virtual tour) 40 POT adopters 50 monthly average No. of engagements on social media sites (i.e. likes, shares, comments, inquiries) 5 Jobs generated Products 6 New POTs downloaded 4 Value-adding/processing of existing farm produce 5 No. of products promoted through online digital platform 9,840 packs of value-added products produced out from farm commodities Publications 10 IEC materials (brochures, leaflets or posters & videos for social media) 4 videos for virtual tour 5 Training modules prepared Patents 5 Copyrights (from IEC materials) Places and partnerships 3 MOA/MOU forged	USeP	Farmers, farm entrepreneurs, private and government agencies/organizations, LGUs, SUCs, students, farming enthusiast and farm visitors	1-Jan-21	31-Dec-22	ONGOING	4,985,048	2,850,024
	SciCAT AVENUES: Access to Value-adding and Engaging iNnovations towards sUstainability of agri-Education and agri-tourISm	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will be implemented for 2 years (January 1, 2021 - December 31, 2022) by Cavite State University in Indang, Cavite, with a total PCAARRD-GIA funding of Php 4,999,507.20. It generally aims to provide more avenues in imparting science-based technologies through farm development and technology application in a sustainable way through the Science for the Convergence of Agriculture and Tourism (SciCAT) site - Silan AgriFarm. Specifically, the project will focus on expanding training for more groups of farm enthusiasts as the project assists technology adoption among trainees. It also targets an increase in job opportunities that will be made available to other community members. More packages of technologies are also expected to be disseminated to increase the value of agricultural products that could lead to an increase in income not only of farm owners but also of resellers and food processors.	People and Services 500 Trained farm owners/farming enthusiasts 8 conducted webinars 40 POT adopters 50 monthly average No. of engagements on social media sites (i.e. likes, shares, comments, inquiries) 10 Jobs generated Products 10 New POTs downloaded 2 Value-adding/processing of existing farm produce Produced the following fresh farm produce and processed goods: a. 2,800 kg of dragon fruit under drip irrigation technology b. 1,200 kg of banana c. 200 bottles of pickled papaya d. 200 bottles of pickled bitter gourd e. 200 bottles of pickled eggplant Publications 10 IEC materials (brochures, leaflets or posters & videos for social media) 10 Training modules prepared Patents	CavSU	Farmers, farm entrepreneurs, private and government agencies/organizations, LGUs, SUCs, students, farming enthusiast and farm visitors	1-Jan-21	31-Dec-22	ONGOING	4,969,507	2,552,754
	Spin-off Commercialization of Nutrio for Improved Production of Sugarcane (Saccharum officinarum) and other Agricultural crops in the Philippines	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Lorem Ipsum	Publication: 1. Video recorded testimonies of farmers who use Nutrio in their crops 2. Developed a video presentation and documentation 3. New and improved Nutrio label and designPatent: Brand or Trade Name : Nutrio with Certificate of Registration No.: 4/2014/00013730 Notice of Patent Approval dated February 26, 2021 Title of Invention : "Microbial-Based Foliar Fertilizer" * Waiting for the Patent Certificate from IPOPhil.Product: ProductÃ‚ : "Microbial-Based Foliar Fertilizer" Brand or Trade Name: NutrioPeople: Training for distributorship of Nutrio Training of target personnel for the commercial production of NutrioPlace: Licensed by the University of the Philippines to manufacture and distribute Nutrio for sugarcane in Partnership with Fullmight Agricultural Corp. (FAC)- Spin-Off Company at ourÃ‚ Extension Address: 1856 Hillside Village, Tuntungin-Putho, Los Banos, Laguna Policy: N/A	Fullmight Agricultural Corporation	Individual farmers (annual crops and sugarcane growers), small and large plantation of sugarcane areas of Luzon, Visayas and Mindanao.	16-Dec-21	15-Dec-22	ONGOING	2,577,998	2,339,398
	Support to the Implementation of the SciTech Superhighway Program of the DOST and IPOPHL/DTI	KRA 3: Rapid, Inclusive and Sustained Economic Growth	DOST, IPOPHL and DTI signed MOA on Nov. 17, 2020 to establish and implement the Science and Technology Superhighway Program (â€œSciTech Programâ€). The SciTech Program aims to facilitate the filing and granting of applications for the registration/grant and protection of IP rights resulting from DOST-supported researches, studies and innovations User. Guevara requested the councils to take turns each year in funding the operationalization of the MOA, starting with PCAARRD IPR applications endorsed by DOST are qualified for expedited Processing -Industrial Designs (5 days) -Utility Models (2 months) -Inventions: Early Publication (within 90 days); with immediate Request for Substantive Examination (within 30 days from the date of publication) -Trademarks: Issuance of Notice of Allowance or Registrability Report, as may be applicable (within 5 working days from filing of the application)	In accordance with the 6P Metric of DOST, the outputs expected to be delivered primarily fall under the Patent, Products, and People Services category. By the end of the one-year program implementation, the Technical Working Group (TWG) should have reviewed a total of 200 UM applications, 200 ID applications; 75 invention applications; and 50 TM applications from DOST-supported researches and innovations. This output will be evaluated under the Patent criterion of the 6P Metric. Moreover, as one of the products of the program, the TWG should have conducted at least twelve (12) meetings for the review and evaluation of the applications received. One meeting will be conducted each month in the duration of the project implementation. In addition, another output expected from the program implementation is an established centralized system utilized for the filing and monitoring of applications from DOST-supported researches and innovations. Under people services, the project should have appointed and trained the following project staff after the one-year implementation: one (1) Senior Research Specialists; one (1) Information Systems Analyst II; two (2) Science Research Specialists I; and one (1) Science Research Specialist I	TAPI	a. Councils b. RDIs c. Technology generators	1-Jan-21	31-Mar-22	ONGOING	4,201,949	4,201,949
	TECHNOLOGY COMMERCIALIZATION OF BETEL NUT ANTHELMINTIC FOR CHICKEN	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Lorem Ipsum	Publication: IEC Materials on Betel Nut DewormerPatent: The Utility model on Betel Nut (Areca catechu) deworming composition for chickens (IPO:2-2015-000500).Product: Commercialization of botanical dewormer for free range native chickens Sustainable supply of locally produced betel nut dewormer for free range Philippine Native Chicken (10,000 kilograms of betel nut dewormer) People: Trained poultry raisers on the use of betel nut dewormer for free range native chickens. Place: Promoted the technology on botanical dewormer as input to Ã¢Â‚Â¬Ã"naturalÃ¢Â‚Â¬Â free-range native chicken production. Policy: System for providing necessary veterinary services to native chicken raisers in Panay Island	BDOZ Veterinary Products Trading	Target Market and Beneficiaries Primary Target Market: Small to medium scale native chicken raisers: Male or female chicken raisers in Region 6/Philippines, age 25-65, raising a minimum of 30 chickens. Ã‚Secondary Target Market: LGUs with chicken dispersal projects Native chicken breederÃ¢Â‚Â¬Â¿cs associations Agrivet Supplies	16-Dec-21	15-Dec-22	ONGOING	3,822,679	3,106,290

PROGRAM	PROJECT	KRA	DESCRIPTION OF PROGRAM/PROJECT/OBJECTIVES	EXPECTED OUTPUT/TARGET	IMPLEMENTING AGENCY	BENEFICIARIES	START	END	STATUS AS OF DECEMBER 31, 2021	TOTAL PROJECT COST	2021 PCAARRD GIA
	Technology Innovation Leaping up Aquaculture Resources through Upscale Production and Commercialization of Daerrys Tilapia Ice Cream (TILAPIA)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Lorem Ipsum	Publication: Developed and distributed at least 2 IEC Materials. Publish one article in Refereed journal.Patent: Submitted Application for Patent/Utility Model for different existing Tilapia Ice Cream products.Product: Commercialize and make the Tilapia Ice Cream products available in the malls and other distribution channel Obtain License to Operate from Food and Drug Administration and applied for Certification of Product Registration (CPR) for at least 3 to 4 ice cream variants. People: Conducted training for backyard fish farmers and carabaoÃ¢â‚¬â„¢s farmers on Tilapia Grow Out management, Food Safety, Good Manufacturing Practices (GMP) and Ss, Packaging and Business Management. Provide job opportunities and increase wages of current production staff. Place: Established linkages/partnership with backyard farmers for the sustainability of raw materials for the upscale production of Daerrys Tilapia Ice cream and downstream products. Signed Memorandum of Agreement or Joint Venture Agreement with the private sector /backyard farmers for the commercialization of the Daerrys Tilapia Ice cream products. Signed memorandum Agreement with the Nueva Ecija Disability Affairs Office/ LGU for the partnership with the companyÃ¢â‚¬â„¢s CSR program Ã¢â‚¬Ã“SCOOP TogetherÃ¢â‚¬â„¢ Policy:	Vera Bella Enterprises Limited Company	The target Beneficiaries of the project are: 1. Carabao backyard farmers- supplier of carabaoÃ¢â‚¬â„¢s milk for the production of Daerrys products. 2. MABUNGA Cooperatives for tilapia grow out management and tilapia processing 3. PWDÃ¢â‚¬â„¢s and their families 4. Women out of the workforce due to pandemic 5. Distributors : Hotels, souvenir shops, supermarkets, malls and specialty restaurants ; on line shoppers (Shopee and Lazada)	16-Dec-21	15-Dec-22	ONGOING	3,999,861	2,812,081
	Testing and Evaluation of Machinery Generated from PCAARRD-funded Projects Phase 2	KRA 3: Rapid, Inclusive and Sustained Economic Growth	For years, the Department of Science and Technology's (DOST) Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD) has funded various projects that developed agricultural machines that would later be commercialized locally. In 2017, PCAARRD-DOST also funded the project titled "Testing and Evaluation of Machinery Generated from PCAARRD-funded Projects" in which 11 machines were AMTEC-tested; and eight Philippine National Standards (PNS), Specifications and Methods of Test, were developed. The proposed project is the continuing phase of the aforementioned project. It aims to conduct the testing and evaluation of new machineries generated from PCAARRD-funded projects that are ready for commercialization, as well as develop the standards for such. The project also aims to conduct the retesting of machineries included in the previous phase of the project to obtain unmeasured performance parameters and determine machine performance after certain improvements and further modifications of the technology generators.	People and Services 1.At least 20 machine testing conducted; 2.Eight (8) consultations conducted; Policies 1.Eight (8) PNS/PABES, Specifications and Methods of Test, for the following machines without the aforementioned standards are developed: a.Dehydrator; b.Green Coffee Sorter; c.Peanut Stripper/Thresher; d.Sea Cucumber Dryer; Publications 1.At least 20 test reports of AMTEC-tested machines are finalized and released; 2.Eight (8) PNS/PABES, Specifications and Methods of Test, are developed	UPLB	AANR Stakeholders	1-Sep-20	31-Aug-22	ONGOING	4,350,755	1,012,189
	Up-Scaling Production of Juan Algae Paste for Aquaculture Application	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Lorem Ipsum	Publication: Â,Â > Publication of a manuscript/extension manual/ IEC materials.Patent: >Â,Â Fabrication/Modification of Utility Model for increase product yield >Â,Â Â,Â Scientific process that can be applied for Intellectual PropertyProduct: >Â,Â Additional Microalgae species as paste product > Improved product quality, enhanced shelf-lifePeople: >Â,Â Training-Demo and lectures to industry practitioners pertaining to Algal Paste utilizationPlace: Â,Â >Â,Â Â,Â Strengthened partnerships and collaborations with aquaculture industryPolicy: >Â,Â Â,Â Come up with a Policy Brief on the use of algae paste for aquaculture >Â,Â Strict Implementation of Good Manufacturing Practices (GMP) Â,Â	Algacon Aquafeeds Manufacturing	The intended primary markets are milkfish, shrimp, crab hatcheries, nurseries and other high-valued species. Secondary market includes growers of other aquaculture species and aquarium fish operators & traders.	16-Dec-21	15-Dec-22	ONGOING	2,790,544	1,887,682