

FY 2019 PCAARRD LIST OF GRANTS-IN-AID PROGRAMS/PROJECTS

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	Design and Development of a Programmable Dehydrator Machine for Herbal Tea Materials	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project aimed to design and develop a programmable dehydrator machine for herbal tea materials powered by solar energy with electric power back-up	•Utility model of Food Grade Dehydrating Machine •Protocol on drying herbal tea products •Protocol on prolonged shelf life of 4 herbal tea products	ISAT U	Local tea producers, machinery fabricators	1-Oct-17	30-Nov-19	ONGOING	4,983,905.00	451,785.80
	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	To design, develop, and to optimize the operating conditions of the automated combined mechanical cacao demucilager-fermenterdryer Activity 1: To design, develop, and evaluate the automated combined mechanical cacao demucilager-fermenter-dryer performance	Filed IPR claims – patents or utility model for the automated combined mechanical cacao demucilagerfermenter-dryer. • At least 1 Thomson Reuters or Scopus-listed journal publication. • One report or paper on the economic viability and social acceptability of the automated combined mechanical cacao demucilager-fermenter-dryer.	USEP	Cacao farmers /Farmers-cooperatives	16-Jul-19	15-Jan-22	NEW	4,945,925.00	1,971,259.00
	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	NEW	4,727,728.00	2,316,326.00
	Development and Use of Nanobiopesticide for the Control of Fusarium Wilt on High Value Crops	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Plant growth-promoting bacteria (PGPB) are free-living and beneficial group of bacteria that can be found in the rhizosphere, root surface and closely adhering soil interface (Compant et al., 2005; Glick, 2012). PGPB indirectly promote plant growth by acting as biological control agents against plant pathogens.  This proposal will take off from the completed project of Dr. Paterno which had identified bacterial isolate PGPB23 that was shown to possess a promising biocontrol activity against R. solanacearum and F. oxysporum. A field trial showed that banana plants treated with PGPB23 in combination with Trichoderma had the lowest Fusarium oxysporum f.sp. cubense infection of 4.55% compared with the untreated control at 30.61% 5 months after planting (Paterno et al., n.d.).  Taking advantage of the wide application of nanotechnology in agriculture, this proposal aims to develop a nanobiopesticide from the metabolite/s of PGPB23 isolate for the control of Fusarium wilt. The nanobiopesticide to be developed offers the following advantages in terms of the following: • Stabilization of biopesticides with nanomaterials; • Controlled and enhanced delivery in stressed environments caused by the pathogen; • Increased thermal storage stability; • Improved efficacy due to higher surface area; and • Higher solubility  The new product to be developed could help in addressing the problem of Fusarium wilt. It could also help reduce the use of synthetic pesticides that harms the environment and poses health hazard to farmers and consumers.	1. Formulated nanobiopesticide for Fusarium wilt control 2. Application protocol of optimized nanobiopesticide formulation 3. At least two (2) publications submitted to refereed journals 4. Three brochures/ flyers (Utilization of nanobiopesticide for the control of Fusarium Wilt on tomato, cucumber and banana) 5. IP application of developed nanobiopesticide 6. One trained personnel in nanotechnology through training at SIU-Carbondale 7. Collaboration with UPLB-IPB, SIU-Carbondale, Lapanday Foods Corp. and farmers’ group/s	UPLB	Farmers, researchers, students	1-Dec-17	29-Feb-20	ONGOING	5,000,000.00	274,449.75

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	Development of Green Packaging Technology Using Eco-Friendly Materials for Rice and other Commodities	KRA 3: Rapid, Inclusive and Sustained Economic Growth	<p>Green is in, not only in terms of energy, financial products and food articles, but also in packaging, and packaging materials are increasingly being labeled as green.</p> <p>Fast population growth, urbanization and industrialization have tremendously increased the demand for and consumption of paper. The resulting high load on natural resources forced the industry to look for alternative raw materials for the production of paper. Rice straw, as a lignocellulosic material abundantly available in Iloilo areas, especially in Zarraga, is a very promising raw material for the paper industry. Using rice straw as raw material would benefit both the farmers and the industry as it will prevent open burning of rice straw and thus prevent release of noxious greenhouse gases that poses serious threats to global air chemistry and human health. Other eco-friendly materials will also be considered and combining them with rice straw as raw material input will be studied.</p> <p>This study will investigate the organic raw materials and develop a process of converting raw materials to produce an eco-friendly material for "green" packaging of rice and other food commodities. Using waste as a raw material and employing environmentally safe processing for making paper is valuable in maintaining the sustainability of the environment.</p>	<p>Year 1: Established process of converting eco-friendly raw materials into green packaging technology.</p> <p>Year 2: Produced a strong durable and moisture resistant organic packaging paper.</p>	ISTU	Organic/Specialty rice Farmers (e.g. ZIDOFA), ISAT U, Inventors, Researchers and consumers	1-Dec-17	28-Feb-19	ONGOING	4,929,172.00	2,264,869.00
	Development of Multiple Strains of Plant Growth Promoting Rhizobacteria-based Biofertilizer for Sustainable Lowland Rice Production	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will utilize biochemical and molecular biology techniques for profiling the soil microbial community diversity and for selecting the most competent PGPR strains that may be combined with organic and inorganic fertilizers.	<p>1. Developed multi-strain biofertilizer for lowland rice in Central Luzon</p> <p>2. Decreased fertilizer usage by 25-35%</p> <p>3. Recommended method and rate of application of developed biofertilizer</p> <p>4. Quantified economic benefits of using the multi-strain biofertilizer technology</p> <p>5. Trained 15 farmers on the developed biofertilizer technology</p> <p>6. 1 publishable technical paper</p>	PhilRice	Irrigated lowland rice farmers; biofertilizer producers; researchers and student; government agencies and academic institutions	1-Dec-16	31-Aug-19	ONGOING	4,999,706.00	296,568.36
	Development of Nano-Biosensor Technology in Disease Surveillance and Diagnosis of Economically Important Crops (Old Title: Plant Disease Outbreak Prevention of Important Diseases in Selected High Value Crops through Nano-Biosensor-Based Biosurveillance)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	<p>The proposed project is an innovative concept with the following unique features:</p> <p>(1) the biosensor provides early detection of potential disease(s); (2) extraction of the causal organism from the sample is built into the MSU's proprietary magnetic nanoparticle (MNP) based assay and is visible to the naked eye due to the formation of a mat between the microorganism and MNP; (3) specific detection is facilitated by an amplification-free probe-gold nanoparticle (probe-Au) conjugate hybridizing with the target RNA/DNA that is visually observable through a color change; (4) end-to-end sample preparation to detection is completed in less than two hours and will cost less than Php100/test. After disease detection appropriate disease control measure will be employed for the disease and the insect vector if transmitted by a vector. Representative crops based on the priority crops identified by PCAARRD-DOST and important diseases associated with these crops will be included in the test, such as: banana (Plantation Crops); white potato, tomato (Vegetables); mungbean, and peanut (Grains and Beans). Important diseases of the representative crops will be identified and sample protocol will be established for triaging. These important diseases are as follows: Panama disease and bunchy for banana, fusarium wilt viral disease in potato, bacterial wilt in tomato, Cercospora Leaf Spot in peanut and Yellow Mosaic Diseases for mungbean. These tests will serve as model to be echoed to other crops and associated diseases. The nanobiosensor kit is economically viable in the production of the crops included in this project being proposed. Monitoring and surveillance of the important diseases of the crops will spare the farmers of employing control measures. Rapid detection using the kit will help in the decision making in applying control measures. If no diseases is detected then pest control action should be done. The cost of monitoring the disease using the kit will be way lower than the cost of employing pest control measures if no disease to control. Low farm</p>	<p>Year 1</p> <p>1. Publications</p> <p>i.; Development of RNA/DNA probe design for the different diseases and pests included in the project (at least 5)</p> <p>2. Patents</p> <p>i.; IP of the Gold nanoparticles with specific RNA/DNA probe (Au probe)</p> <p>3. People Services</p> <p>i.; At least 5 graduate students</p> <p>4. Places and Partnerships</p> <p>i.; Concerned agencies like LGUs, DA, and academic institutions</p> <p>5. Policy</p> <p>i.; Policy brief governing the spread of invasive plant pathogens and their insect vectors</p> <p>Year 2</p> <p>1. Publications</p> <p>i.; Quick on-site detection of plant pathogens using nanobased kits (at least 2)</p> <p>i.; Manuals, Guide, IEC materials for on-site detection (at least 3)</p> <p>2. Patents</p> <p>i.; Au-probe Process for each disease</p> <p>3. Products</p> <p>i.; The Nano-Biosensor Technology to be developed by this proposed project will produce a Biotechnology</p>	DLSU	farmers, agricultural technicians, pest clinic laboratories	1-Jul-18	30-Jun-20	ONGOING	12,300,000.00	2,570,852.00

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	Improving Production Efficiency and Cane Yield in a Sugarcane Block Farm Using an Automated Furrow Irrigation System	KRA 3: Rapid, Inclusive and Sustained Economic Growth	A PCAARRD funded-project on “Smart Water Management Strategies for Sugarcane” was implemented by CLSU to determine which irrigation application method and timing of application will give higher yield of sugarcane. The comparative study between subsurface drip irrigation (SDI), furrow irrigation and fully rainfed condition was conducted from 2014 to 2016 using PHIL 00-2569 sugarcane variety in a 5,000 sq m experimental area at the LAREC compound in Floridablanca, Pampanga. Single row planting with a planting density of 30,000 seedpieces per hectare was maintained in 5.2 m x 12 m plots. It has been established from the said research project that with supplemental irrigation, sugarcane production becomes economically viable and considerably increases the income of planters. From the field experiments, lowest yield came from fields that depended entirely on rainfall (75 tons/ha). Although furrow-irrigated sugarcane gave 20% better yield (194 tons/ha) than drip-irrigated crops (162tons/ha), the total amount of water applied in furrow irrigation is 62% higher than drip irrigation. The results gave a lower water productivity for furrow irrigation (29 kg/m3) than drip irrigation (63 kg/m3). Hence, this proposal shall aim to increase water use efficiency in furrow irrigation systems using precision farming technology for the sustainability of irrigated farming systems. This proposal on smarter irrigation for sugarcane block farms shall focus on the development of an adaptive real-time system for the automation and control of furrow irrigation. The system shall provide the sugarcane industry with an intelligent furrow irrigation system able to compete with the alternative pressurized systems of sprinkler and drip systems on capital cost, water and labor savings but without the high energy costs. Precision irrigation continues to be a cornerstone of CLSU’s work. The precise control of irrigation water for improving water use is critical for the continuous improvement of sugarcane production areas where water resources are normally	1. Accurate water deliveries and applications with an increase in water savings of 20% from manual furrow irrigation 2. Involvement of two (2) undergraduate/graduate students in the project 3. MOA with Sugar Regulatory Administration, DAR, ARBOs, BSWM, and DA RFOs 4. Publication in refereed journal 5. Patent application for the automated furrow irrigation system 6. Trainings conducted for the application of automated furrow irrigation system and fabrication of sensors and automated gates 7. Policy recommendation on the conversion of rainfed cultivation into irrigated cultivation	CLSU	1. Sugarcane Planters 2. Sugarcane Technicians 3. Researchers on Smart Farming Applications 4. Students	16-Apr-18	15-Jul-20	ONGOING	5,000,000.00	1,100,249.00
	Pilot Testing of Actinomycetes Biocontrol Agents (ACTiCon Against Fusarium oxysporum TR4 in Cavendish Banana	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project is being proposed to confirm effectiveness of ACTiCON when used in different areas in Mindanao.	1. Best application method, optimum dosage and frequency of application of ACTiCon, a biocontrol formulation against Foc TR4 (Y1) 2. Validated technical and economic viability of using ACTiCon; packaging of ACTiCon, a (Y2) 3. Registration of ACTiCon, a with concerned government agency. (Y2)	UPLB	Banana growers, banana plantation managers, entrepreneurs, researchers	1-Mar-18	29-Feb-20	ONGOING	5,000,000.00	1,945,378.91
	Pilot Testing of Combined Conduction and Far Infrared Radiation Dryer (Old Title: Pilot Testing of Far-infrared Radiation Paddy Dryer)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project is being proposed to pilot test the FIR paddy dryer at farmer’s cooperative level to determine the technical and economic merits and benefits of the technology and come up with an improved design, which is acceptable to farmers and other rice industry end-users and ready for commercialization.	1. 2 pilot testing sites established 2. 2 manufacturers trained on fabrication, assembly and installation 3. trained dryer operator farmers 4. Filed IPR claims and licensing of local manufacturers 5. detailed engineering drawings 6. cost-benefit and break even analysis	PhilRice	Farmers, farmer cooperatives, rice traders, millers, local manufacturers	1-Oct-17	30-Jun-20	ONGOING	4,997,557.00	628,780.92
	Pilot Testing of Peanut Postharvest Mechanization and Bulk Storage Technologies in Selected Regions in the Philippines	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will pilot test the three prototype postharvest machines developed under the 3-year project: Postharvest mechanization and storage support system for peanut funded by DOST-PCAARD and implemented by the Cagayan State University. The Pilot Testing of the peanut stripper, peanut sheller, and automated aerated bulk storage system will be done to improve machine performance, economic viability, and social acceptance considering the varying conditions, and socio-economic environment in the regions.	1. One unit of commercial model of peanut stripper cum pod sorting machine 2. One unit of commercial model of peanut sheller cum sorter machine 3. One unit of commercial model of automated aerated bulk storage system for peanut pods	CSU	peanut farmers and one peanut processor/trader	1-Jul-18	30-Jun-20	ONGOING	5,000,000.00	1,028,311.00

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	Pilot Testing of WiltCure as a New Biocontrol Agent Against Fusarium Wilt of Solanaceous Crops	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Solanaceous crops such as tomato, chili pepper and eggplant are being affected by major pests and diseases, including Fusarium oxysporum which causes Fusarium wilt. Farmers still rely on synthetic chemicals to prevent or control Fusarium wilt. However, these chemical pesticides are hazardous to health and can result in environmental contamination. In this regard, the use of biocontrol agents has emerged as a promising alternative. Unlike conventional pesticides which are generally synthetic materials that directly kill or inactivate the pathogen, biocontrol agents are considered eco-friendly and easy to use. In response to a limited number of biocontrol agents available for use by our farmers, BIOTECH-UPLB is now developing new biocontrol agents. Among these new products is WiltCure. WiltCure is a biocontrol agent against Fusarium wilt of solanaceous crops. It is a powdered formulation with the callus and fungus co-culture extract as the active ingredient. It was found effective when tested in pot/greenhouse experiments. It was also shown to be very safe to humans and the environment. Initial results of the field testing were very promising with the use of WiltCure resulting to higher yield, and consequently, higher income by our farmers. In the course of developing WiltCure as a new biocontrol agent, it is necessary that multi-location trials be conducted to see if the effectiveness of this product extends not only in one location but in other regions as well. Hence, this project is being conducted.	i.; Year 1: Best application method, optimum dosage and frequency of application of WiltCure as a biocontrol agent against Fusarium wilt of solanaceous crops i.; Year 2: Validated technical and economic efficiency of WiltCure; increased capacities of stakeholders including farmers and technicians through conduct of trainings.	UPLB, CLSU	i.; Farmers, consumers, entrepreneurs, researchers, students	1-Oct-17	31-Mar-20	ONGOING	5,000,000.00	1,150,438.50
	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 general objective of this project is to modernize the copra drying process in the Philippines using solar panels as main source of heat energy and develop an innovative convection-type solar-powered dryer suitable for rural areas to help improve the quality of copra produced by the local coconut farmers.	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 manuals for operation and maintenance and standard drying schedule of copra using solar dryer	ISU	Coconut farmer organizations, copra traders and machinery fabricators	1-Oct-19	30-Sep-21	NEW	4,999,904.00	400,702.00
	Toxicological Study and Pilot Testing of Nutriōa„C Biofertilizer for Improved Production of Sugarcane in Regions III and VI(Old Title: Toxicological Studies of Newly Developed Biofertilizers for Various Crops)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The research will be conducted for toxicological evaluation of the newly developed biofertilizers for various crops. This research could assure the quality and guarantee the success of inoculation of new crop and acceptance by the farmer. The research will conducted at BIOTECH-UPLB.	1. Generation of data from results on the toxicity tests 2. Assured quality and guaranteed success of inoculation 3. Identified at least one metabolite from the component organism 4. 1 poster and oral paper 5. 1 publication	UPLB	Entrepreneurs, Farmers, LGUs, Researchers	16-Nov-17	15-May-20	ONGOING	5,000,000.00	1,216,573.48
Development of Rubber-based Cropping Systems in Southern Philippines (Land Management of Diverse Rubber-based Systems in Southern Philippines)	Project 1. Effective Rubber-Based Cropping Systems in Agusan del Sur and North Cotabato	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The aim of the project is to boost household income for indigenous and smallholder farmers through developing a rubber-based cropping system that increases smallholder farmers' income through crop diversification, identifying key soil constraints, improving soil nutrient management practices and enhancing pest and disease management in the uplands of Southern Philippines	Project research partners have the expertise in using effective model rubber-based cropping systems, economic analysis, and land suitability analysis to continue to evaluate the establishment and/or expansion of the rubber production in Agusan del Sur and beyond. Project research partners are capable of using robust nutrient diagnostic tools and assessing soil health indicators for the best nutrient management and long-term sustainability of rubber production. Smallholder farmers in the study areas understand the soil chemical and physical constraints of their lands for rubber production and the most suitable rubber-based cropping systems for their lands and family to achieve the best income. D. Extension practitioners are able to understand and interpret the results from land suitability analysis, soil nutrient deficiency tests and economic analysis for identifying the suitable land, appropriate intercropping crops and best management practices fro rubber production. E. The economic income of indig	USM	Rubber Stakeholders. Policy makers, researchers, planters processors, traders, etc.	1-Jun-19	31-May-24	NEW	3,308,851.00	266,600.00

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Development of Rubber-based Cropping Systems in Southern Philippines (Land Management of Diverse Rubber-based Systems in Southern Philippines)	Project 2. Land Suitability Analysis for Rubber Crops in Agusan del Sur	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The aim of the project is to boost household income for indigenous and smallholder farmers through developing a rubber-based cropping system that increases smallholder farmers' income through crop diversification, identifying key soil constraints, improving soil nutrient management practices and enhancing pest and disease management in the uplands of Southern Philippines	Database on land use status, soil properties and landscape characteristics and requirement of resources by rubber and intercrops. Due date: June 2020 Database and report on the spatial variation in soil properties, land use, erosion, landscape types and in one sub-catchment of Agusan del Sur. Due date: Dec 2021 Data and report on the key soil limiting factors for production of rubber and associated intercrops in the uplands in one selected sub-catchment of Agusan del Sur. Due date: Jun 2022 Database and maps of pH, clay content, key nutrient distribution, topography, land suitability and land use planning for the rubber-based inter-cropping systems in one selected sub-catchment.	USM	Rubber Stakeholders. Policy makers, researchers, planters processors, traders, etc.	1-Jun-19	31-May-22	NEW	1,322,025.00	105,000.00
Development of Rubber-based Cropping Systems in Southern Philippines (Land Management of Diverse Rubber-based Systems in Southern Philippines)	Project 3. Developing Rapid and Affordable Soil Nutrient Test Fertilizer Formulation	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The aim of the project is to boost household income for indigenous and smallholder farmers through developing a rubber-based cropping system that increases smallholder farmers' income through crop diversification, identifying key soil constraints, improving soil nutrient management practices and enhancing pest and disease management in the uplands of Southern Philippines	Data and report on the key soil limiting factors for production of rubber and associated intercrops in the uplands in one selected sub-catchment of Agusan del Sur.	USM	Rubber Stakeholders. Policy makers, researchers, planters processors, traders, etc.	1-Jun-19	31-May-24	NEW	4,749,621.00	342,000.00
Development of Rubber-based Cropping Systems in Southern Philippines (Land Management of Diverse Rubber-based Systems in Southern Philippines)	Project 4. Development of Cost Effective Pest and Disease Management for Rubber and Intercrops	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The aim of the project is to boost household income for indigenous and smallholder farmers through developing a rubber-based cropping system that increases smallholder farmers' income through crop diversification, identifying key soil constraints, improving soil nutrient management practices and enhancing pest and disease management in the uplands of Southern Philippines	a. Pest and Disease Profile of Rubber-based Systems in Agusan Del Sur and Kabacan b. Pest and Disease Management Protocol for Rubber and Intercrops c. Publications (articles for journal and IEC materials)	USM	Rubber Stakeholders. Policy makers, researchers, planters processors, traders, etc.	1-Jun-19	31-May-24	NEW	2,610,100.00	216,600.00
Development of Rubber-based Cropping Systems in Southern Philippines (Land Management of Diverse Rubber-based Systems in Southern Philippines)	Project 5. Economic Studies on Rubber-based Cropping System in Southern Philippines	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The aim of the project is to boost household income for indigenous and smallholder farmers through developing a rubber-based cropping system that increases smallholder farmers' income through crop diversification, identifying key soil constraints, improving soil nutrient management practices and enhancing pest and disease management in the uplands of Southern Philippines	Report on economic opportunity, market access and risk analyses of the rubber and key intercrops	CarSU	Rubber Stakeholders. Policy makers, researchers, planters processors, traders, etc.	1-Jun-19	31-May-24	NEW	1,810,576.00	114,100.00
Development of Rubber-based Cropping Systems in Southern Philippines (Land Management of Diverse Rubber-based Systems in Southern Philippines)	Project 6. Capacity Building of Rubber Stakeholders and Role of Women and Children in Natural Rubber Industry in Agusan del Sur	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The aim of the project is to boost household income for indigenous and smallholder farmers through developing a rubber-based cropping system that increases smallholder farmers' income through crop diversification, identifying key soil constraints, improving soil nutrient management practices and enhancing pest and disease management in the uplands of Southern Philippines	1. Current rubber industry situation and profile of the role of women and children in the study areas 2. Qualitative and quantitative baseline data role of women and children in production and marketing of rubber ; 3. Evaluation and analysis of data and policy recommendations to address to needs of the rural stakeholders to strengthen and to uplift the economic well-being of rubber industry participants.	USM	Rubber Stakeholders. Policy makers, researchers, planters processors, traders, etc.	1-Jun-19	31-May-22	NEW	1,613,789.00	114,100.00
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	The general objective of this project is to perform in-house and field validation of the developed portable nanobiosensor for the detection of fungal diseases of cacao	Product: A validated 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 Policies: Application for patent has been included in the expected outputs within the 6Ps.	UPLB	Cacao and Coconut-Farmers (cacao is usually intercropped with coconut) Ⓐ Agricultural Technicians Ⓐ Pest Control Companies Ⓐ Cacao Traders Ⓐ Cacao Processors/Grinders Ⓐ Cacao Food and Wellness Markets	1-Oct-19	30-Sep-21	NEW	5,153,328.00	3,161,538.00

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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 5: Integrity of the Environment and Climate Change Mitigation and Adaption	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	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 Niña year; dry/ El Niño 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 Niña year; dry/ El Niño 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	30-Apr-21	ONGOING	8,087,511.00	2,860,179.88
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 5: Integrity of the Environment and Climate Change Mitigation and Adaption	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 US\$1180 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	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	30-Apr-21	ONGOING	8,557,191.00	2,988,375.00

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status <sup>1</sup> As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
Smarter Approaches to Reinvalidate 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 5: Integrity of the Environment and Climate Change Mitigation and Adaption	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	30-Apr-21	ONGOING	8,140,995.00	2,638,086.19
Smarter Approaches to Reinvalidate Agriculture as an Industry in the Philippines (SARAI) - Phase 2	Project 1.4. Phenology Studies, Crop Management, and Model Development for Banana	KRA 5: Integrity of the Environment and Climate Change Mitigation and Adaption	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	30-Apr-21	ONGOING	10,919,994.00	3,548,763.39
Smarter Approaches to Reinvalidate Agriculture as an Industry in the Philippines (SARAI) - Phase 2	Project 1.5. Evaluation of Crop Growth Simulation Model for Soybean and Tomato	KRA 5: Integrity of the Environment and Climate Change Mitigation and Adaption	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	30-Apr-21	ONGOING	6,122,896.00	983,021.00
Smarter Approaches to Reinvalidate 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 5: Integrity of the Environment and Climate Change Mitigation and Adaption	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-ICMF 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	30-Apr-21	ONGOING	61,051,546.00	12,184,426.70

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
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 5: Integrity of the Environment and Climate Change Mitigation and Adaption	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	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-21	ONGOING	11,075,929.00	3,619,078.97
Smarter Approaches to Reinvigorate Agriculture as an Industry in the Philippines (SARAI) - Phase 2	Project 2.3. Smarter Technologies for Crop-Water Management	KRA 5: Integrity of the Environment and Climate Change Mitigation and Adaption	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.	i.; Wireless SARAI Soil Moisture Monitoring System i.; Web-based version and mobile application of Water balance-Assisted Irrigation Scheduler (WAIS) i.; Locally fabricated atmometers that are adapted for use in many fields to assist in irrigation scheduling i.; Field Demonstration site featuring wireless soil moisture sensors, web-based decision support tool (WAIS) and automated irrigation system i.; Spectral reflectance database of priority crops under different water stress condition i.; Water management recommendations and advisories using web-based/mobile WAIS i.; Conduct of Trainings and Workshops i.; Paper presentations and publications i.; Student involvement i.; 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	30-Apr-21	ONGOING	10,967,294.00	3,672,100.00



Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
Smarter Approaches to Reinvigorate Agriculture as an Industry in the Philippines (SARAI) - Phase 2	Project 2.4. Insect Pest and Disease Advisory System	KRA 5: Integrity of the Environment and Climate Change Mitigation and Adaption	The SARAI Insect Pest and Disease Advisory System (IPDAS) will continue to address the pressing concerns in crop protection brought about by the changing climate. The project will develop and sustain a decision support system for the management of pests and diseases of corn, coconut, coffee, cacao, banana, sugarcane and vegetables. SARAI IPDAS shall implement surveillance and monitoring of pests and diseases which growth and spread are critically influenced by weather and climate patterns. Population and spread models will be developed to deliver forecasts of probable pest outbreaks and disease epidemics. IPDAS will also develop a database of common insect pests and diseases of SARAI priority crops and generate current and historical incidence maps for various regions	1. Predictive models Models for several major insect pests and diseases will be developed to provide risk prediction and management advisories. Study 1 - RICE - Rice tungro virus disease, Rice black bug, locust, armyworm, stem borer Study 2 - CORN - Locust, Corn borer, corn leafhopper, armyworm Study 3 - SUGARCANE - Stem borer, White grub, locust Study 4 - COCONUT - Coconut hispine beetle (Brontispa sp. ) Coconut scale insect, Coconut bud rot Study 5 - BANANA - Banana Sigatoka, Fusarium wilt, Hispodonta sp., thrips, mealybug Study 6 - COFFEE and CACAO - Cacao pod rot, Vascular Streak dieback, helopeltis, Coffee rust, coffee berry borer Study 7 - SOYBEAN - brownspot, leaf blight, downy mildew, pod feeders and defoliators 2. Detailed database of common pests and diseases for the all the identified crops in various regions. 3. Region-specific maps of possible pest and disease outbreak areas for certain crops. 4. Pest management protocols	UPLB	PCAARRD Regional Consortia, Department of Agriculture, Regional Agricultural Officers, Municipal Agricultural Officers, Farming Communities	1-May-18	30-Apr-21	ONGOING	8,315,245.00	2,805,789.00
Smarter Approaches to Reinvigorate Agriculture as an Industry in the Philippines (SARAI) - Phase 2	Project 2.5. Soil Profiling and Characterization of SARAI Sites	KRA 5: Integrity of the Environment and Climate Change Mitigation and Adaption	Soil sampling and profiling will be performed on the study sites. Soil samples will be sent to the laboratory for physical, chemical, and mineralogical analyses. The results obtained from the lab will be the baseline data that researchers will utilize for their fertilizer application and water and crop management. The same lab results will be utilized as baseline data by crop modelers for their crop model development. During the growth period of the crop, soil samples will be taken and analyzed as necessary or as requested by the researchers. Soil moisture sensors will be imbedded at different soil horizons and the changes in soils moisture will be continuously monitored. The data obtained from this monitoring will be forwarded to other researchers who need them for irrigation management or for crop modelling.	1. Soils database 2. Trained collaborators 3. Journal article	UPLB	1. Farmers 2. LGUs and government agencies 3. scientists, researchers, and students	1-May-18	30-Apr-21	ONGOING	7,082,564.00	1,801,495.21
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 5: Integrity of the Environment and Climate Change Mitigation and Adaption	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	PAGASA, BSWM, agriculture officers/technicians, farmers and the general public	16-May-18	15-May-21	ONGOING	20,234,350.00	3,188,157.00

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
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 5: Integrity of the Environment and Climate Change Mitigation and Adaption	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 PCAARRD'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	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	30-Apr-21	ONGOING	8,454,291.00	2,814,597.00
Smarter Approaches to Reinvigorate Agriculture as an Industry in the Philippines (SARAI) - Phase 2	Project 3.2. Knowledge and Capacity Building	KRA 5: Integrity of the Environment and Climate Change Mitigation and Adaption	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	30-Apr-21	ONGOING	13,792,653.00	4,553,559.90
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 1: Transparent, Accountable and Participatory Governance	The main objective of Project 3.3 is to facilitate the creation of an active network consisting of the academe, NGAs, LGUs, and farming communities which will work towards seamless agricultural information sharing and processing protocols. Specifically, the project components aims to: 1. Maintain and expand the network of partners to ensure the sustainability of the program; 2. Facilitate the integration of all research results of the various project components; 3. Craft policy recommendations, and publish research results in peer-reviewed journals; 4. Develop and implement a communication plan to promote the scientific results of the program to various stakeholders in layman's terms and popular formats; and 5. Serve as the program management component of the program to ensure that the timelines are met, and that the outputs are delivered.	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-21	ONGOING	15,594,815.00	4,064,951.02

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	Biological Control Potential of Bacteriophages for Soft Rot Disease of High Value Vegetable Crops in the Philippines (old title: Bacteriophage-mediated Management Approach for Soft-rot Disease of High Value Crops in the Philippines)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	<p>Problems that plague the vegetable industry in the Philippines include not only on how to increase production but also how to transport products without incurring too much wastage. In perishable crops such as vegetables, freshness, good quality and longer shelf life are always desirable. Disease is a major cause of postharvest losses in perishables. For vegetables, this accounts for 40 to 50% of the losses (Pantastico, 1975; Estigoy, 2006). Soft rot of high value vegetables such as carrots, potatoes, crucifers and lettuce has always been a perennial problem of the vegetable industry in the Philippines and in Southeast Asia.</p> <p>Soft rot disease of most vegetables caused by the bacteria Pectobacterium carotovorum subsp. carotovorum (Pcc) is prevalent and can almost always be found in most vegetable growing agroecosystems. It is considered both a field and post-harvest pathogens of several high value vegetable crops such as cabbage, carrots, broccoli, potatoes and lettuce. Penetration of the pathogen is facilitated by natural and artificial wound produced during the implementation of cultural practices, harvesting, and improper transport conditions. In Luzon, most of the vegetables are grown in the highlands of Benguet and Nueva Vizcaya and are transported to the major markets in Metro Manila to reach the bulk of the consumers. In the Visayas, major vegetable growing areas are in the island of Panay, Negros and Cebu which are all being marketed in the cities of Bacolod, Iloilo, Cebu and Mandaue. In Mindanao scattered cultivation areas in Davao de Sur, Davao del Norte, Bukidnon and South Cotabato focus the marketing of their produce in the cities of Davao, Cagayan de Oro and General Santos. Large economic losses resulting from significant yield reductions in the field, in transit, and during storage have occurred. However, effective control methods have not been developed yet.</p>	<ol style="list-style-type: none"> <li>At least two (2) publications in ISI-indexed journal</li> <li>Baseline data on the diversity of bacterial pathogens associated with soft rot of high value vegetables in the Philippines</li> <li>Baseline data on the diversity and specificity of bacteriophages associated with soft rot Enterobacteriaceae in the Philippines</li> <li>Trained manpower in the form of students BS (2 BS Agriculture &amp; Plant Pathology, 2 BS Agricultural Biotechnology, 2 BS Biology &amp; Microbiology) and 2 MS (Plant Pathology, Microbiology) and their thesis research supported by the project</li> <li>Upgraded 1 laboratory for teaching, research and extension through equipment acquisition and research collaborations</li> </ol>	UPLB	Researchers will benefit from the generated scientific information about the potential of bacteriophages as bio-control agent against soft rot diseases of high value vegetables in the Philippines. Government extension agencies (DA, SUCs) will benefit from the gained scientific information for the management of soft rot diseases in vegetables. Students and government agencies will benefit from the trained manpower that will be one of the outputs of this project.	1-Aug-17	31-Jan-20	ONGOING	4,999,478.00	757,428.00
	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	The project generally aims to generate a draft genome of A. destructor and A. rigidus for mining of genes of pest management importance.	<ol style="list-style-type: none"> <li>Genome size estimate of Aspidiotus destructor and A. rigidus;</li> <li>Draft genome sequence of A. destructor and A. rigidus submitted to the GenBank or other online databases;</li> <li>Partial list of genes of pest management importance;</li> <li>Partial list of SSR and SNP markers for the two (2) coconut scale insect species; and,</li> <li>A paper presented in conferences leading to a research publication in ISI or Scopus-indexed journal.</li> </ol>	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-Oct-19	30-Sep-21	NEW	5,000,000.00	3,568,536.00
	Confirmatory Testing of Protein-based Marker Kit for Detection of Philippine 'Carabao' Mango in Commercial Mango Nurseries and Germplasm Collection (Old Title: Pilot Testing and Validation of Protein-based Marker Kit for Detection of Philippine 'Carabao' Mango in Commercial Mango Nurseries and Germplasm Collection)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	A protein-based detection kit for identifying true-to-type Philippine Carabao mango using antiserum generated from protein markers specific for the carabao mango variety has been developed. The kit was able to discriminate the 'Carabao' varieties from the non-carabao types. However, before this technology is brought to the users the performance of this dipstick should be strongly validated. This project will pilot test and validate this developed technology specifically for mango commercial nurseries and germplasm collection to evaluate sensitivity and effectivity of the developed kit in discriminating true-to-type 'Carabao' variety. The success of this technology will help ensure dispersal of quality planting materials of Philippine 'Carabao' Mango for sustained production of fresh fruits and quality raw materials for processing for the local and export market. This is also one of the identified priority strategies on dedicated and consistent work on standards to address Global Trade Barriers to support the global value chain of the Philippine Mango Industry.	<ol style="list-style-type: none"> <li>'Carabao' mango specific antisera.</li> <li>Working dipstick for identification of Philippine Carabao Mango.</li> <li>Results of confirmatory testing in commercial mango nurseries and germplasm collection.</li> <li>Trained 10 nursery operators and BPI personnel on the use of the dipstick kit.</li> </ol>	VSU	Mango growers and nursery operators, researchers and extension workers	1-Oct-18	30-Sep-20	ONGOING	5,000,000.00	666,587.50

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	Cytological Mapping of DNA Markers for Insect Resistance and Other Important Genes in Coconut (Cocos nucifera L.) through Florescence In Situ Hybridization	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	<p>In 2014, the coconut industry experienced the coconut scale insect infestation that affected approximately 1.2 million coconut trees in CALABARZON. This infestation had a huge impact on the livelihood of the farmers, and the coconut industry itself. To minimize loss of yield due to infestation and other related plant diseases, identification of varieties or accessions with resistant genes are needed.</p> <p>Fluorescent In Situ Hybridization (FISH) is a molecular cytogenetic technique that enables the detection and localization of specific DNA or RNA sequence on the chromosome allowing a fluorescently labeled DNA or RNA sequence (DNA or RNA probes) to specifically bind to complimentary site on the chromosome thereby pinpointing its chromosomal location. This will then result to the direct visualization of hybridization sites that may either mark the position of gene(s) or the regions closely linked to the gene of interest. Information gathered in FISH can be used in chromosome mapping, which is the assignment of genes to specific location on a chromosome.</p> <p>The DNA markers for insect resistance and other markers of significance for coconut improvement identified or developed from the "Coconut Genomics Program Project 8" will be used as probe to locate the position of the DNA markers on the chromosomes. FISH would allow early screening of genes to specific location on a chromosome.</p> <p>Coconuts are difficult crops to to breed as they have long generation interval (about 8-10years), cross pollinating behavior of tall coconut varieties, inability to undergo vegetative propagation,, low number of seeds produced by palm,, and massive stature of the palm (Gupta, 2015). But with the aid of molecular techniques, specifically FISH, varieties with insect resistance genes and good agronomical traits can be identified at early stages as well as the selection for the potential breeding population.</p>	Identified coconut accessions with genes for insect resistance and other important genes that are important in improving coconut varieties.	UPLB	Molecular biologists and molecular breeders, coconut farmers	1-Aug-18	31-Jul-20	ONGOING	5,000,000.00	671,449.20
	Development of Biofungicide for the Control of Alternaria solani and other Fungal Pathogens of Tomato and Eggplant	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	<p>Early blight is a major fungal disease of tomatoes, eggplant, pepper and potatoes caused by the fungus, Alternaria solani. It is very common in the tropics especially under warm weather and very humid or wet conditions. The disease affects the older lower leaves and stems of the plants and eventually affects the fruits. It is estimated that global expenditure for the control of A. solani alone is around \$77M annually. Chemical fungicides have been used to control fungal plant pathogens but these chemicals pose possible dangers to domestic and wild animals and can be harmful to beneficial insects. This proposal aims to develop a biofungicide composed of microbial enzymes that specifically target fungal pathogens. Unlike biocontrol agents that make use of whole, living cells whose effect take longer to be realized and which can be affected by harsh environmental conditions, this biofungicide's effects are faster and more direct in its target. It is envisioned that this biofungicide can become an alternative to chemical fungicides and play an important role in organic agriculture pest control since it is biodegradable, non-toxic to humans and animals and does not pollute the environment.</p> <p>This field presents many opportunities for development because 1) initial studies have shown great possibility for development of such biofungicides, 2) fungal cell walls are individually unique and require various types of enzymes, and 3) our country's rich biodiversity offers an unlimited selection of microorganisms that can be optimized for laminarinase and chitinase production for a variety of applications. It is therefore the objective of this proposal to develop a concoction of the microbial enzymes, laminarinase and chitinase, that targets Alternaria solani and other major fungal pathogens of tomato and eggplant.</p> <p>This project has 3 main components: in Component 1, isolates with high levels of chitinase activity will be screened from culture collection isolates and from</p>	<p>1. Formulated preliminary concoction of the biofungicide containing preparations of laminarinase and chitinase enzymes as main ingredients</p> <p>2. Journal articles</p> <p>Working titles of possible publications:</p> <ol style="list-style-type: none"> <li>1. Characterization of a chitinase enzyme with antifungal activity against tomato fungal pathogens</li> <li>2. Development of an enzyme-based biofungicide against Alternaria solani</li> </ol> <p>3. Oral papers or poster papers presented in scientific conferences (see below for titles)</p> <p>4. MS Microbiology student and 2 undergraduate BS Biology students with thesis conducted on sections of the project</p>	UPD	<p>The target beneficiaries of the project research results are:</p> <ol style="list-style-type: none"> <li>1. Organic/conventional farmers and vegetable growers who wish to use alternative pesticidal agents which are neither toxic nor harmful to the environment.</li> <li>2. Academics, scientists and students</li> <li>3. General consumers</li> </ol> <p>Initial results of the concoctions will serve as basis for other formulations of enzymes for other vegetable fungal pathogens.</p>	1-Jul-18	30-Jun-20	ONGOING	4,999,283.20	1,033,485.20

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	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' 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	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 "academic and research institutes, SMEs involved in eggplant industry ii. Eggplant researchers "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 "long-term beneficiaries of profitable, less costly and safe varieties	1-Jul-18	30-Jun-23	ONGOING	36,668,412.00	5,315,093.30
	Documentation of Indigenous Vegetables in the Philippines	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Indigenous vegetables can alleviate micronutrient deficiency that afflicts the more than two billion people worldwide, the mild vitamin A deficiency in 40 million pre-school children as well as the iron deficiency that afflicts about 1.5 billion particularly pregnant women and children. Nutritionists and social scientists believe that integration of food rich in micronutrients like vegetables in the diet is the only sustainable way to improve micronutrient status in the human body.  Indigenous vegetables (IVs) are an important component of traditional farming systems and home gardens in the Philippines. They have been an indispensable component of the Filipino food. They can help increase the food basket of Filipinos, broaden their food choices and help improve their nutrition. They are important to our nutritive wellbeing. They are the main inexpensive and natural source of minerals, vitamins, fiber, and in some cases proteins, that staple foods cannot adequately provide. However, they are underutilized despite their recognized importance in supplementing food and nutritional need of the people. Possible reasons are lack of available germplasm for widespread use, lack of seeds, lack of information on use and importance, lack of information about their performance and input requirements, lack of information of how they can fit into production systems, the preferential emphasis on the production, marketing and consumption of high-value vegetables, and the low regard of some consumers toward the consumption of indigenous vegetables.  IVs blend themselves perfectly to the burgeoning movement towards natural sources of nutritional supplements, organic agriculture, paleo diet, health and wellness. They have been cultivated for centuries, including under resource-limited environments, without the benefit of chemical inputs, and as such are perfect candidates for adoption in organic agriculture. Their cultivation across	1. At least two (2) papers presented in scientific conferences 2. At least 1 scientific paper published in an ISI-indexed scientific journal (Year 2)  3. Survey of diversity, historical cultivation and production, traditional and novel uses, seed supply, published and unpublished printed and electronic resources on indigenous vegetables of the Philippines in 50 municipalities in 25 provinces for 2 years  4. Compilation of published and unpublished, printed and electronic resources on indigenous vegetables of the Philippines from relevant agencies  5. Accessible database of published and unpublished, printed and electronic resources on indigenous vegetables of the Philippines  6. Compendium of literature on indigenous vegetables of the Philippines (Year 2)  7. 20 popularized pamphlets on indigenous vegetables of the Philippines  8. 1 book on indigenous vegetables of the Philippines  9. 2 articles on indigenous vegetables of the Philippines in national newspapers	UPLB	Government agencies, researchers, and students will benefit from the compiled scientific information about indigenous vegetables in the Philippines Government agencies will benefit from the manpower trained on indexing, abstracting and summarizing publications for inclusion in a database The general public will benefit from popularized publications on indigenous vegetables of the Philippines	16-Jan-18	15-Jul-20	ONGOING	11,816,179.20	5,626,969.15
	Efficacy Evaluation of Biopesticides Derived from Entomopathogenic Fungi Against Rind Borer (RB) and Twig Blight Disease for Citrus(Old Title: Potential of two entomopathogenic fungi, Beauveria bassiana and Isaria fumosorosea as biological control agents against Citrus Rind Borer (CRB) and Twig Blight Disease (TBD) of citrus)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	This study tries to verify the efficacy of two Philippine isolates of entomopathogenic fungi (EPF) against citrus rind borer and twig blight disease (TBD) of Citrus. Based on the results of previously conducted preliminary trials under in-vitro and in-vivo, EPF can control citrus rind borer infestation and dramatically reduce severity of twig blight disease infection of citrus. Formulated biopesticides will be derived from the two EPF. Further, this study tries to test its efficacy as BCA against citrus rind borer and TBD infestation is aimed to be 40%.	Publication - 1 scientific paper to be published in ISI journal Patent - 2 utility models for mass production of bioinsecticide and biofungicide respectively; 1 brochure Product - 1 formulated mycelial-free extract with effective dosage; 1 formulated spore with effective concentration People Services - Two (2) undergraduate students and trained five (5) NVSU personnel Places and Partnership - Municipal Agriculture Office, Kasibu, Nueva Vizcaya, Malabing Valley Multipurpose Cooperative, Kasibu, Nueva Vizcaya and Diamantina, Aurora Isabela	NVSU	Researchers and agricultural scientists, professor and students, and citrus growers and consumers	16-Apr-18	15-Apr-20	ONGOING	4,993,912.40	1,024,115.60

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	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). «Carabao» 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, Elsino« 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 «Carabao» 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	Products (10) « One (1) GBS database for stem-end rot resistance in mango « One (1) GBS database for scab resistance in mango « At least eight (8) molecular markers for scab and stem-end rot resistance in mango People Services (12) « Ten (10) trained personnel « Two (2) MS Plant Breeding/Biology/Plant Pathology Students Places and Partnerships (2) « Partnership with University of the Philippines Los Baños (UPLB) « Partnership with Bureau of Plant Industry-Guimaras National Crop Research, Development and Production Support Center (BPI-GNCRDPSC) Publications (4) « Two (2) papers for publication « Two (2) scientific paper presentations Patents (2) « One (1) molecular marker kit for scab resistance « One (1) molecular marker kit for stemend 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-Jun-19	31-May-22	NEW	11,875,045.00	4,107,415.00
	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 cornerstone in providing information for breeding and research tools for mango farmers.	« 3 Mangifera genomes ( M. indica L. cv. 'Carabao', M. altissima and M. odorata) « 1 online database with annotated SNPs for marker design « 1 bioinformatics pipeline suitable for mango genome complexity Accommodate at least 1 MS student and 1 BS student 3 international training of bioinformatics attended by UR/URA for capacity enhancement At least 1 article in refereed and ISI journal	UPLB	1. Researchers 2. Breeders 3. Students	1-Jul-19	30-Jun-22	NEW	7,799,208.00	3,987,735.00
	Improved Resource-use Efficient (IRUE) Rice Varieties for the Philippines	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	A project that aims to evaluate newly developed rice lines for improved resource use efficiency and identify the promising IRUE lines that require less amount of fertilizer (Nitrogen, Phosphorus and Potassium) and irrigation water which will be beneficial for Filipino resource-poor farmers.	Most suitable ILs nominated into national trials for access by resource-poor farmers	UPLB	Rice farmers, researchers, millers, traders, processors, and other rice industry stakeholders.	16-Sep-16	15-Dec-19	ONGOING	15,674,496.00	1,022,360.42

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	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. Adapted and tested over the years, resistant to more destructive pests observed in high yielding varieties (HYV&€™s) and requires low production input and management. These characteristics of traditional rice corroborated with previous studies (Tad-awan et al., 2010; CECAP, IRRI and PHILRICE, 2000 and Andam, 1995). Heirloom rice in the present day parlance, has continuously been grown by indigenous peoples in the Cordillera region, albeit under more difficult conditions. The IRRI has geo-tagged several communities of the region as traditional rice growers. In a multidisciplinary research project conducted in two traditional rice growing communities in the province of Benguet, findings show that growing rice landraces is sustained throughout the agricultural calendar using traditional farming practices. While the use of local knowledge systems has been sustained, the participatory needs and opportunities assessment in 2014 reveal increasing problem on pests and diseases affecting seedlings and tillers, aside from the perennial problem on irrigation and inadequate farm machineries (Tad-awan et al., 2015). Interestingly, the women&€™s sector figure in the identification of issues and opportunities concerning the cultivation and maintenance of traditional rice culture. More women decide in most of the aspects on heirloom rice production. Postharvest operations,	Publishable scientific articles for submission to Clavirate/Scopus indexed Journals or peer reviewed journals @ IECs (Technoguide on Heirloom Rice Production) Patent is not applicable in this study, however, a copyrighted technoguide, "Heirloom Rice Production in CAR" will be published. Seeds of promising rice landraces with market potential @ Increased productivity of selected rice landraces with market potential per location @ Cost analysis resulting from best management practice @ Package of technology (POT) for heirloom rice Training on heirloom rice production Signing of Memorandum of Agreement/Understanding between collaborating agencies: 1. LGU Kibugan 2. LGU Bauko 3. MPSPC Inputs to the conservation of heirloom rice landraces	BSU		1-Jan-19	31-Dec-20	NEW	4,988,421.00	2,213,740.40
	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	To evaluate, select and develop sweetpotato varieties/accessions with high betacarotene, anthocyanin and resistant to SPFMV to increase yield, dry matter and starch content suitable for commercial production.	Products @ Morphological and molecular database of characterized Philippine sweetpotato germplasm @ Sweetpotato accessions with resistance to SPFMV @ Promising sweetpotato germplasm/varieties with special traits (anthocyanin and betacarotene) and high root dry matter and starch content suitable for commercial production @ Planting materials of superior sweetpotato varieties for distribution to growers, researchers, and other interested end-users @ Molecular fingerprints of different accessions of sweetpotato Publication @ An IEC material for management and disease screening of SPFMV disease. @ Publications (atleast 2)	UPLB	Sweetpotato farmers/growers, bio-fuel manufacturers/processors, stakeholder, researchers	1-Sep-19	31-Aug-22	NEW	10,292,351.72	4,243,095.94
	Nutritional Analysis of Selected Indigenous Vegetables in the Philippines	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	A project on the conduct nutritional analysis of selected priority indigenous vegetables in the Philippines where the information is lacking.	1. At least 1 paper presented in a scientific conference @ 2. At least 1 scientific paper published in an ISI-indexed scientific journal 3. Nutritional analysis of at least 20 indigenous vegetables on the Philippines	UPLB	Government agencies, researchers, and students will benefit from the availability of nutritional composition of indigenous vegetables of the Philippines.	1-Apr-19	31-Mar-20	NEW	3,000,000.00	3,000,000.00
	Performance Evaluation of the 2-Pronged Coconut Hybridization Scheme in CALABARZON	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	In the case of CALABARZON, at present still it has the biggest cocal hectarage but, not in the highest in terms of production	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	4,981,298.00	696,456.37

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	Pest Management Strategy for Coconut Scale Insect, <i>Aspidiotus rigidus</i> , in Zamboanga Peninsula(Old Title: Intervening Pest Management Strategy for Coconut Scale Insect, <i>Aspidiotus rigidus</i> , in Zamboanga Peninsula)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	The outbreak of the coconut scale insect, <i>Aspidiotus rigidus</i> Reyne (Hemiptera: Diaspididae), commonly known as COCOLISAP caused massive damage to coconut plantations and natural stands in the southwestern part of the island of Luzon, Philippines from 2010 to 2014. To help mitigate losses, some farmers in affected areas cut down dying trees to sell for lumber. Recovery from this is hard as it takes at least 5 years after planting for coconut trees to begin bearing fruit (Watson et al., 2014). In 2014, this pest has affected 2.1 million trees in Southern Tagalog areas. Approximately 65% of the infected trees have died, while fruit yields have reportedly dropped an average of about 60% (FAO, 2014). Damage caused by this species has led to work being completed on natural enemies and other control methods, where it led to the implementation of an Integrated Pest Management program which includes leaf pruning, trunk injections, insecticide sprays, biocontrol agents, and fertilization to hasten recovery of infested trees (Philippine Coconut Authority, 2014). Full recovery from <i>A. rigidus</i> in Southern Tagalog was attained by early 2016.Outbreaks of this species appear to occur when the scale is introduced into new areas that have favorable environmental conditions. Favorable conditions include densely planted coconut palms, a humid climate, and strong winds to facilitate dispersal (Watson et al., 2014). Additional areas of invasion in the Philippines are recorded in Basilan and Zamboanga Peninsula, which reached epidemic status in 2017. Such that a rapid intervention is highly needed. Thus, this project is being proposed.	The deliverable of this proposed project is the development of a system that will provide the necessary information to launch a response on detection of CSI in Zamboanga Peninsula.	DLSU	Coconut farmers, extension workers, academe, researchers, other stakeholders, and decision makers in Zamboanga Peninsula.	16-Dec-17	15-Dec-19	ONGOING	5,000,000.00	1,084,492.00
	Pilot Testing and Validation of SSR Marker Kit for Philippine Mango Germplasm in Commercial Mango Nurseries	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	This project is a continuation of the completed project on molecular markers for mango in collaboration with the completed DOST-PCAARRD funded project titled, "Genetic Markers and Immuno based identification of Philippine 'Carabao' Mango."The project generated SSR markers to identify the genetic relatedness of different mango cultivars grown in the Philippines. The aim of this proposal is to pilot test the utility of such markers in distinguishing the "Carabao" mango strain over other cultivars. Likewise, the said markers will also be used in validating the authenticity of mango strains as labelled.	1. Validated and certified SSR marker for identification of mango cultivars 2. Standard protocol for mango SSR Analysis 3. 25 nurseries with accurate label for mango cultivars. 4. Training module and actual training done 5. Catalogue of mango cultivars	USM	mango growers, nursery owners, BPI NSQCS (BPI Accreditation Unit), NSIC, researchers, breeders	1-Jun-18	31-May-20	ONGOING	5,000,000.00	1,400,828.80
	Pilot-scale Verification of the Textile Fiber Properties of BANDALA (Backcross Abaca With Native and Desirable Accessions to Lift Up the Abaca Industry)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	to conduct pilot-scale process verification of utilizing bandala fiber for spun yarns production.	Publication- One (1) scientific journal for peer review Patent/Intellectual Property- One (1) IP filed (product/process) Product - Two (2) type of yarns developed - One hundred (100) kilos of blended yarns - Two hundred (200) meters of light and heavy weight woven/knitted fabrics - Five (5) types of fabrics developed (2-powerloom woven, 2-handloom woven, 1- knitted) People Services- Two (2) people trained (PTRI personnel) Partnership- One (1) linkage	PTRI	1. Farmers/farming communities 2. Spinning mills 3. Weaving and knitting companies 4. Handloom weaving communities 5. Fashion design industry 6. Government employees 7. Uniform manufacturers 8. Garment producers/retailers	1-Oct-19	30-Sep-20	NEW	4,999,055.00	567,388.87
	Revitalizing the Abaca Industry through S&T Interventions for Higher Crop Productivity using High-Yielding and Virus Resistant Abaca Hybrids	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	The project will cater on the production of tissue cultured abaca hybrid seedlings, further testing the performance/stability of the hybrids, and showcasing the package of production technologies through multilocation trials and demonstration farms for possible commercialization of the hybrids. With this, a more scientific, ecologically safe and sound production will be used to maximize the benefits of abaca production and eventually, assuring the farmers of regular income stream.	1. Establishment of 11 nurseries, 2 multi-locational trials, 8 fertilization trial plots, and 4 demonstration farms/trials of the abaca hybrids; 2. Demonstration and promotion of high-yielding and virus-resistant abaca hybrids and package of production technologies including drip irrigation/fertigation; 3. Production of abaca hybrids against other major diseases; 4. Sustainability plan for the production of abaca hybrid planting materials	BU, CarSU, CatSU, PhiFIDA V, PhiFIDA VIII, PhiFIDA XI, UEP, USEP, USM, UPLB, VSU, WMSU	Farmers/Farmer Cooperatives, nursery operators, Local Government Units (LGUs), and abaca processors	1-Mar-16	29-Feb-20	ONGOING	45,670,799.00	830,844.75



Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	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 Baños (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 “warm bodies” 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 • Molecular biologists and molecular breeders • Young professionals and student researchers	1-Jul-18	30-Jun-21	ONGOING	40,550,716.80	7,693,284.48
Citrus Resources Research for Development in Cagayan Valley (CRR4DCV)	Project 2. Genebank and Database Profile of Citrus Genetic Resources	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Project focuses on conserving and documenting citrus cultivars and available local citrus genetic resources for the purpose of breeding, research and utilization in the Philippines	1. A total of thirty-one (31) citrus species collected and characterized; of this total, 1-3 accessions per species collected in twenty two (22) species while 5-15 accessions collected for each of the remaining nine (9) citrus species averaging to 134 accessions; 2. At least three (3) mother trees grown, and maintained/conserved in large earthen pots for each distinct germplasm for an average of 402 mother trees maintained in the genebank;  12 3. Molecular fingerprints of at least five (5) for each native and backyard cultivars and local citrus collections; 4. A database profile of citrus cultivars and germplasm with standard descriptions; 5. A central database system for citrus genetic resources linked with NPGR’s documentation system; 6. At least two (2) training programs organized and sponsored on PGR conservation and management, molecular characterization, computer and database systems and operations; and 7. Published at least one (1) article per component study in refereed scientific journal and three (3) IEC materials on citrus cultivars and germplasm conservation and management.	NVSU	1. Citrus Growers in Nueva Vizcaya and Cagayan Valley 2. Traders, processors and input providers 3. Researchers/ Breeders 4. Nursery owners/operators 5. Agricultural Technicians 6. R&D planners, researchers, policy makers	16-Nov-16	15-Nov-19	ONGOING	11,863,915.99	1,556,029.85
Citrus Resources Research for Development in Cagayan Valley (CRR4DCV)	Project 3. Establishment of Quality Planting Materials Production System for Citrus in Nueva Vizcaya	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Project proposes to model a workable system for the establishment of a quality planting materials production system in Nueva Vizcaya. This project will involve the partnership of Nueva Vizcaya State University (NVSU), the provincial government, and private citrus entrepreneurs	1. A model system for production of quality planting materials of citrus 2. Improved one (1) foundation and budwood increase blocks and two (2) citrus nurseries 3. Increased seedling production of NVSU (from 3,000/year to at least 7,000/year) and of the Municipal Agriculture nursery (from 1000 to at least 2,000/year) 4. 200 indexed citrus mother trees in the NVSU Foundation and Budwood Increase Blocks and 90-100% indexed budwood sources in production areas 5. Developed web-based map based on geotagging of infected and non-infected citrus mother trees  14 6. BPI-accredited NVSU and MAGRO nurseries 7. Established one (1) new orchard established with NVSU citrus planting materials; one (1) existing orchard adopting improved production and pest and disease management practices 8. Published at least one (1) article in scientific refereed journal and produced at least two (2) IEC materials on nursery management and orchard establishment 9. Trained at least ten (10) nursery operator on production of disease-free planting materials, rapid propagation technique, and nursery management 10. Conducted at least two (2) farmers’ field day	NVSU	1. Citrus Growers in Nueva Vizcaya and Cagayan Valley 2. Traders, processors and input providers 3. Researchers/ Breeders 4. Nursery owners/operators 5. Agricultural Technicians 6. R&D planners, researchers, policy makers	16-Nov-16	15-Nov-19	ONGOING	7,851,441.83	1,744,169.51

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
Citrus Resources Research for Development in Cagayan Valley (CRR4DCV)	Project 4. Development of Pests and Diseases Management Systems for Sustainable Citrus Production in the Philippines	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Project focuses on development of pest and disease management systems for sustainable citrus production in Cagayan Valley.	1. Data on current disease prevalence of (e.g. HLB, CTV etc.) 2. Population dynamics of the Asian citrus psyllid, aphid 3. Document with description of local citrus diseases and insect pests 4. One (1) integrated and systematic spraying schedule to control major pests and diseases of citrus 5. At least seven (7) control strategies employing IPM and IDM techniques 6. At least seven (7) IPM/IDM organic-based control tactics against pests and diseases of citrus 7. Seven (7) verification trials or demonstration trials harnessing the best control tactics identified 8. Seven (7) demonstration trials combined with good agricultural management practices as well as IPM and IDM strategies 9. At least five (5) organic-based biopesticides 10. Four (4) pilot testing showcasing the most effective organic-based biopesticides	NVSU	1. Citrus Growers in Nueva Vizcaya and Cagayan Valley 2. Traders, processors and input providers 3. Researchers/ Breeders 4. Nursery owners/operators 5. Agricultural Technicians 6. R&D planners, researchers, policy makers	16-Nov-16	15-Nov-19	ONGOING	9,506,255.32	1,937,901.79
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	<p>Tomato (<i>Solanum lycopersicum</i> 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%).</p> <p>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.</p> <p>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.</p>	<p>1.At least two (2) publications in ISI-indexed journal</p> <p>2.Disease profile in fresh and processing tomato production</p> <p>3.Efficacy of healthy seedling technology for leaf curl management in fresh and processing tomato production</p> <p>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</p> <p>5.IEC materials on healthy seedling and carrageenan technologies, and ICM recommendation.</p> <p>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</p>	UPLB, NFC	<p>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.</p> <p>Government extension agencies (RCPCs, SUCs, and LGUs) will benefit from the gained scientific information and generated products and technologies.</p> <p>Students and SUCs will benefit from the trained manpower that will be one of the outputs of this project.</p> <p>Tomato farmers will be the ultimate beneficiary of project outputs.</p>	1-Nov-17	31-Oct-20	ONGOING	6,726,305.10	727,714.79
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	<p>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.</p> <p>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%).</p> <p>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</p>	<p>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</p> <p>2.Efficacy of modified release strategy of biological control agents and carrageenan technology to manage insect pests of fresh and processing tomatoes</p> <p>3.Improved weed management strategies in fresh and processing tomato production</p> <p>4.Field validated ICM recommendation</p> <p>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 &amp; weeds)</p> <p>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 biocon laboratory in mass production</p> <p>7.Enhanced the capability of trained farmer leaders, extension and project personnel on information campaign strategies of biologically-based insect pest management</p> <p>8.MOA with SUC, LGU and Cooperative.</p> <p>9.Enhanced the capability of RCPC I in mass production of BCAs</p> <p>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,</p>	UPLB	<p>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.</p> <p>Tomato growers and government extension agencies (DA-RCPCs, SUCs) will benefit from technologies, recommendations, and trainings on mass production of biological control agents.</p>	1-Nov-17	31-Oct-20	ONGOING	4,199,097.92	455,706.39

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status 'As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
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	<p>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.</p> <p>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 &amp; 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.</p> <p>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).</p> <p>SSNM approach advocates sufficient use of nitrogen (N), phosphorus (P) and</p>	<p>Year 1</p> <ul style="list-style-type: none"> <li>Networking and coordination with NFC, LGUs, MMSU and farmers in the selected sites</li> <li>Baseline profiling of farmers nutrient and soil management practices/production systems</li> <li>Profiling, collection and laboratory analysis of soil characteristic</li> <li>Consolidated baseline data for use in the formulation of SSNM</li> <li>Set-up MOET and OPT in selected farmers' fields</li> <li>Identified yield-limiting nutrients in farmers field</li> <li>Estimated yield and various nutrient use efficiency parameters</li> <li>Estimated soil nutrient supplying capacity</li> <li>Determined/formulated fertilizer rates for the SSNM treatment plot</li> <li>Formulated ICM incorporating specific fertilizer recommendation and disease, insect pest and weed management</li> </ul> <p>Year 2</p> <ul style="list-style-type: none"> <li>Set-up ICM experiment in farmers' fields</li> <li>Monitored crop response to the integrated crop management strategy</li> <li>Estimated yield and various nutrient use efficiency parameters</li> </ul> <p>Year 3</p> <ul style="list-style-type: none"> <li>Field validated ICM strategy and evaluation crop responses to the recommendation</li> <li>Estimated various nutrient use efficiency parameters</li> <li>Fine-tuned and calibration of ICM strategy</li> <li>Prepared manual and IEC materials on site-specific nutrient management technology</li> <li>Prepared and submitted articles on the result of the experiment for publication</li> </ul>	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	ONGOING	4,074,592.28	556,320.02
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 'Carabao' 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	<ol style="list-style-type: none"> <li>Validated 3 potential 'Carabao' mango strains/selections with red blush and 1 with thick peel from other mango varieties</li> <li>Identified at least 1 stop-gap mango cultivar/variety for 'Carabao' mango</li> <li>Produced 3 more putative hybrids by pairing/clipping method of hybridization</li> <li>Established breeding blocks for mangro hybridization program</li> <li>Fully characterized fruits of 3 hybrids produced from the previous project</li> <li>Published at least 2 papers in scientific journals</li> </ol>	UPLB	<ol style="list-style-type: none"> <li>Mango growers</li> <li>Processors</li> <li>Traders/Exporters</li> <li>Researchers/Breeders</li> </ol>	1-Nov-15	31-Oct-21	ONGOING	15,949,889.94	2,975,225.56
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 'Carabao' 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 'Carabao' mango and development of other stop-gap varieties.	<ol style="list-style-type: none"> <li>Confirmed reaction of 3 'Carabao' and 2 other mango varieties resistant to anthracnose</li> <li>Confirmed reaction of 2 'Carabao' and 1 other mango variety resistant to fruitfly</li> <li>Confirmed reaction of 3 hybrids from the previous project and 3 new hybrids</li> <li>Published at least 2 journal articles</li> </ol>	UPLB	<ol style="list-style-type: none"> <li>Mango growers/exporters</li> <li>Researchers</li> <li>Breeders</li> </ol>	1-Nov-15	31-Oct-21	ONGOING	10,411,429.50	1,817,477.57
ENHANCING THE PRODUCTIVITY AND MARKETABILITY OF QUEEN PINEAPPLE	Comparative Field Performance of Tissue Culture-Derived Plantlets and Suckers of Queen Pineapple - Phase 2 (Old Title: Field Analysis of Tissue Culture-Derived Planting Materials and Sucker of Queen Pineapple in Leyte and Camarines Norte Conditions)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Field analysis will be done on the existing experimental set-ups on tissue culture-derived Queen pineapple planting materials and suckers established in two coconut densities (high density consisting of 100 or more palms per hectare and low density consisting of below 100 palm trees per hectare) under Leyte and Camarines Norte conditions. The conduct of this field analysis is a continuation of the project on comparative performance of tissue culture-derived planting materials and suckers of Queen pineapple in two Queen pineapple-producing provinces.	<ol style="list-style-type: none"> <li>Adaptive, productive and high-yielding Queen pineapple populations suitable for coconut intercropping;</li> <li>Protocol on the management of tissue culture-derived Queen pineapple planting materials, starting from the transferring of seedlings from the culture bottles to field planting, and;</li> <li>IEC material on the production and management of tissue culture-derived Queen pineapple.</li> </ol>	VSU	pineapple growers ins region 5 and 8, pineapple traders (local and export), pineapple processors, research institutions, LGUs/SUCs	16-Apr-19	15-Apr-20	NEW	1,000,000.00	717,754.43
ENHANCING THE PRODUCTIVITY AND MARKETABILITY OF QUEEN PINEAPPLE	Project 3. Optimization of Planting Density Regulations of Queen Pineapple in Intercropped System	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	To determine the optimum plant population of queen pineapple under intercropped systems in Regions 5 and 8.	A technology recommendation or protocol on the optimum population density of queen pineapple under different intercropping systems in Region 5 and Region 8	DA Regional Field Unit V, VSU	Queen pineapple farmers, Agricultural technicians, LGU's, Farmers associations and cooperatives and other institutions involved in queen pineapple, coconut or pili production or industry.	1-Apr-16	14-Jan-20	ONGOING	7,371,852.00	515,367.00

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status 'As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
Improvement of Coconut Varieties through Genomics, Genetics and Breeding for a Competitive and Sustainable Philippine Coconut Industry	Evaluation of Coconut Wrinkle 1 Gene Expression and its Effect in Oil Biosynthesis in a Model Monocot Zea mays L. (Project 5- Phase 2)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	The project aims to express and evaluate the Coconut Wrinkle 1 (CnWR11) gene in association with oil biosynthesis in an experimental monocot model system Zea mays L. (corn).	1. Plant tissue culture products, regenerating transformed tissues, whole plantlets in bottles, plantlets in the process of hardening/acclimatization and plants in the BL2 greenhouse and transgenic corn seeds. 2. Validation of CnWR11 as a positive or negative effector molecule in the oil biosynthesis pathway by correlating the result of qPCR, total fat content and fatty acid profile in the corn kernels 3. Development of a working protocol for other selected/novel coconut genes for validation and functional analysis	UPLB	Direct beneficiaries will be plant physiologists and agronomist/agriculturists who will adopt the developed tissue culture protocols for other related or unrelated studies such as further improvement/enhancement of the protocols, use of the protocols for mutation induction using embryogenic cell suspensions, etc. Knowledge and development of techniques for enhanced gene expression studies for undergraduate (BS ABT) and graduate students (MS and PhD in MBB).  Industry stakeholders who might invest in the maturation of the technology developed for the production of coconut oil and other products derived from the corn grains for food and industrial applications.	1-Nov-17	31-Oct-20	ONGOING	4,830,408.00	1,114,363.00
Improvement of Coconut Varieties through Genomics, Genetics and Breeding for a Competitive and Sustainable Philippine Coconut Industry	Project 4 -Phase II: Comparative Transcriptomics of Normal, Makapuno and Lono Coconut Endosperms	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	The project would give a better and deeper understanding of the genetic and molecular mechanisms underlying coconut oil biosynthesis, makapuno and lono phenotypes. These would serve as the springboard for the development of molecular marker specific to these traits and eventually the genetic improvement of coconut. Highly improved coconut varieties mean higher oil yield and better endosperm types which translates to higher profit for the Filipino coconut farmers.	1. Identified genes and gene networks associated with normal, makapuno, and lono phenotypes; 2. Gene expression patterns of selected endosperm-related genes across developmental stages of normal Laguna Tall, makapuno and lono endosperms; 3. Cytochemical patterns across developmental stages of normal Laguna Tall, makapuno, and lono endosperm; 4. Reassembled and re-annotated transcriptome data via reference-guided assembly; and, 5. Developed DNA markers targeting differentially expressed genes.	UPLB, PCA-ARC	Direct beneficiaries will be molecular biologists and molecular breeders, as well as coconut farmers.	1-Jun-18	31-May-20	ONGOING	4,999,195.00	1,682,179.70
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) 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	ONGOING	15,744,919.00	2,601,306.10
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 d. Patents e. Products (3) a. On-farm Seed Processing and Storage: 1 system recommended b. On-farm Seed Selection: 2 varieties purified, multiplied, and distributed c. People Services & 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 d. 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	ONGOING	14,566,795.00	2,555,718.75

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
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	ONGOING	13,627,821.00	2,585,662.60
Improvement of Soybean (Glycine max (L.) Merr.) for Better Nutrition, Higher Income, and Enhanced Soil Health	Project 5. Improvement of Soybean in Surigao del Sur 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 Tago river floodplains, 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 “Improvement of Soybean (Glycine max (L.) Merr.) for Higher Income, Enhanced Soil Health, and Better Nutrition”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 “One (1) guide/factsheet/technical info “One (1) IEC material in English and in local language (leaflet/poster/related material) “Training  People Services “Two (2) organizations assisted (related to partnerships) - with 20 households per organization “Twenty (20) students trained  Partnerships “Two (2) MOAs with organizations	SDSSU	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	NEW	2,499,500.00	716,250.00
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 “Improvement of Soybean (Glycine max (L.) Merr.) for Higher Income, Enhanced Soil Health, and Better Nutrition”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 “One (1) guide/factsheet/technical info “One (1) IEC material in English and in local language (leaflet/poster/related material) “Training  People Services “Two (2) organizations assisted (related to partnerships) - with 20 households for each organization “Twenty (20) students trained  Partnerships “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	NEW	2,499,500.00	716,250.00
Regional Durian R&D Program: Enhancing Productivity and Sustainability of the Durian Industry in Southern Mindanao (Phase 2)	Project 1. Optimum Durian Tree Management for Increased Productivity	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Good yield and quality of fruits can be affected by a number of factors. One of these is cultural management, which includes ideal tree architecture “ derived by regulating its canopy size and tree height through pruning and detopping of trees. These management practices will give proper height and spacing of the fruiting branches that allows air circulation and sunlight penetration resulting to good temperature within the tree that will improve flowering and fruit setting. If the canopy is too dense, pollinator like bats cannot go through from flower to flower resulting to poor fruit setting and inferior fruit quality. Subsequently, outstanding fruit quality may be obtained which are thick aril, fine texture and flavor, yellow to golden yellow pulp, and small seeds through flower buds and fruit thinning at various stages. Trees must also have overall resistance to pests and diseases, and can be made to bear from 50-150 fruits per tree per year.	1. Optimized fruit production through application of technology on the proper and appropriate cultural management on pruning, detopping, flower and fruit thinning for optimum production of quality durian fruits for domestic and export market, as well as on height and fruiting branches. 2. Extended harvesting season by two months 3. Increased yield by 20% and improved quality of fruits.	BPI-DNCRDPSC	1. Commercial durian growers 2. Small scale-durian farmers 3. Farm Contractors 4. Wholesaler/retailers/exporters Research institutions 5. Researchers 6. LGU’s 7. Planners	1-Oct-17	31-Dec-19	ONGOING	4,812,643.00	958,826.00

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
Regional Durian R&D Program: Enhancing Productivity and Sustainability of the Durian Industry in Southern Mindanao (Phase 2)	Project 2. Optimum Fertilization to Enhance Yield and Quality of Fresh Durian in Southern Mindanao	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Fertilization of durian in Southern Mindanao is provisional and only based on experiences of growers. Durian is heavily fertilized by many commercial growers but there is no clear plant and soil testing methods used as basis for fertilization. Information on soil test values as a basis for fertilizer recommendation in durian is very scarce. Some literatures suggested using the fertilizer recommendation for avocado because these crops have similar growth behavior. Improper nutrition leads to longer time for the crop to bear fruit, irregular fruiting, low fruit set, high abscission which results to lower yield, susceptibility to diseases and inferior fruit quality due to uneven fruit ripening, flesh burn and wet core. The main basis of fertilizer recommendation for major field crops in the country today particularly for fruit trees is with the use of soil analysis. However, in many countries including Thailand, leaf analysis has been successfully used as a guide in diagnosing nutritional problems and as basis for fertilizer recommendations (Poovarodom, et al., 2006). For durian that is native to Southeast Asia, limited information is available on leaf nutrient standards.  Soil characteristics varies from one location to another and fluctuations in durian leaf and soil nutrient element levels were closely related to soil fertility and seasonal changes in the crop phenology (Lim et al., 1999). It is therefore necessary that nutrient concentration standards for durian based on soil tests and plant analyses be established as a basis for optimum fertilization to enhance yield and fruit quality of durian in Region IX and Region XII.	1. Increased yield and improved durian fruit quality; 2. Optimum fertilizer recommendation for durian based on leaf analysis validated and verified, and; 3. GIS-aided suitability maps for durian in Davao and Cotabato provinces.	USM, UseP, BPI-DNCRDPSC	1. Commercial durian growers 2. Small scale-durian farmers 3. Farm Contractors 4. Wholesaler/retailers/exporters 5. Research institutions 6. Researchers 7. LGUâ€™s 8. Planners	1-Oct-17	31-Dec-19	ONGOING	6,761,011.00	1,290,676.00
Reinvigorating the Philippine Coconut Industry through Coconut Somatic Embryogenesis Technology	Project 1a. Mass propagation and pilot utilization of plumule-derived plantlets of Tall and Dwarf coconut varieties through CSet for Batangas and Quezon	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Coconut tissue culture through somatic embryogenesis is an alternative technique for mass propagation of coconut. The technology involves the use of plumules from mature coconut to produce true-to-type planting materials. The PCA-ARC developed a protocol on somatic embryogenesis using coconut plumule and has produced 80-120 seedlings from a single plumule. This protocol is currently being enhanced to increase production of more seedlings per plumule to as much as 1,000 per plumule using the high yielding tall and dwarf coconut varieties.	1. Improved propagation technique for in vitro culture of coconut using CSet 2. Upgraded tissue culture laboratories of participating institutions 3. Trained laboratory personnel on rapid production of planting materials through CSet 4. Increased the current 80-120 seedlings per plumule production through enhanced PCA CSet protocol to 1000 seedlings per plumule 5. Distributed quality planting materials to farmers	UPLB	The major beneficiaries are the smallhold coconut growers in Batangas and Quezon who are dependent on coconut farming as their livelihood.	1-Oct-14	31-Dec-19	ONGOING	29,293,247.00	1,999,879.09
Reinvigorating the Philippine Coconut Industry through Coconut Somatic Embryogenesis Technology	Project 1b. Mass propagation and pilot utilization of plumule-derived plantlets of Tall and Dwarf coconut varieties through CSet for Laguna, Rizal and Cavite	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Coconut tissue culture through somatic embryogenesis is an alternative technique for mass propagation of coconut. The technology involves the use of plumules from mature coconut to produce true-to-type planting materials. The PCA-ARC developed a protocol on somatic embryogenesis using coconut plumule and has produced 80-120 seedlings from a single plumule. This protocol is currently being enhanced to increase production of more seedlings per plumule to as much as 1,000 per plumule using the high yielding tall and dwarf coconut varieties.	1. Improved propagation technique for in vitro culture of coconut using CSet 2. Upgraded tissue culture laboratories of participating institutions 3. Trained laboratory personnel on rapid production of planting materials through CSet 4. Increased the current 80-120 seedlings per plumule production through enhanced PCA CSet protocol to 1000 seedlings per plumule 5. Distributed quality planting materials to farmers	UPLB	The major beneficiaries are the smallhold coconut growers in Laguna, Rizal and Cavite who are dependent on coconut farming as their livelihood.	1-Oct-14	31-Dec-19	ONGOING	28,593,331.00	1,581,972.76
Reinvigorating the Philippine Coconut Industry through Coconut Somatic Embryogenesis Technology	Project 2. Mass propagation of plumule-derived plantlets of Tall and Dwarf coconut varieties through CSet for Regions VI, VII, and VIII	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Coconut tissue culture through somatic embryogenesis is an alternative technique for mass propagation of coconut. The technology involves the use of plumules from mature coconut to produce true-to-type planting materials. The PCA-ARC developed a protocol on somatic embryogenesis using coconut plumule and has produced 80-120 seedlings from a single plumule. This protocol is currently being enhanced to increase production of more seedlings per plumule to as much as 1,000 per plumule using the high yielding tall and dwarf coconut varieties.	1. Improved propagation technique for in vitro culture of coconut using CSet 2. Upgraded tissue culture laboratories of participating institutions 3. Trained laboratory personnel on rapid production of planting materials through CSet 4. Increased the current 80-120 seedlings per plumule production through enhanced PCA CSet protocol to 1000 seedlings per plumule 5. Distributed quality planting materials to farmers	VSU	The major beneficiaries are the smallhold coconut growers in Regions VI, VII, and VIII who are dependent on coconut farming as their livelihood.	1-Oct-14	31-Dec-19	ONGOING	25,538,489.00	1,914,319.45
Reinvigorating the Philippine Coconut Industry through Coconut Somatic Embryogenesis Technology	Project 3. Mass propagation of plumule-derived plantlets of Tall and Dwarf coconut varieties through CSet for Davao Oriental and Davao del Norte	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Coconut tissue culture through somatic embryogenesis is an alternative technique for mass propagation of coconut. The technology involves the use of plumules from mature coconut to produce true-to-type planting materials. The PCA-ARC developed a protocol on somatic embryogenesis using coconut plumule and has produced 80-120 seedlings from a single plumule. This protocol is currently being enhanced to increase production of more seedlings per plumule to as much as 1,000 per plumule using the high yielding tall and dwarf coconut varieties.	1. Improved propagation technique for in vitro culture of coconut using CSet 2. Upgraded tissue culture laboratories of participating institutions 3. Trained laboratory personnel on rapid production of planting materials through CSet 4. Increased the current 80-120 seedlings per plumule production through enhanced PCA CSet protocol to 1000 seedlings per plumule 5. Distributed quality planting materials to farmers	UPMin	The major beneficiaries are the smallhold coconut growers in Davao Oriental and Davao del Norte who are dependent on coconut farming as their livelihood.	1-Oct-14	31-Dec-19	ONGOING	25,394,301.00	1,991,735.00

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status <sup>1</sup> As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
Reinvigorating the Philippine Coconut Industry through Coconut Somatic Embryogenesis Technology	Project 4. Mass propagation and pilot utilization of plumule-derived plantlets of Tall and Dwarf coconut varieties through CSet for Albay, Camarines Sur, and Masbate	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Coconut tissue culture through somatic embryogenesis is an alternative technique for mass propagation of coconut. The technology involves the use of plumules from mature coconut to produce true-to-type planting materials. The PCA-ARC developed a protocol on somatic embryogenesis using coconut plumule and has produced 80-120 seedlings from a single plumule. This protocol is currently being enhanced to increase production of more seedlings per plumule to as much as 1,000 per plumule using the high yielding tall and dwarf coconut varieties.	1. Improved propagation technique for in vitro culture of coconut using CSet 2. Upgraded tissue culture laboratories of participating institutions 3. Trained laboratory personnel on rapid production of planting materials through CSet 4. Increased the current 80-120 seedlings per plumule production through enhanced PCA CSet protocol to 1000 seedlings per plumule 5. Distributed quality planting materials to farmers	PCA-Albay	The major beneficiaries are the smallhold coconut growers in Albay, Camarines Sur, and Masbate who are dependent on coconut farming as their livelihood.	1-Oct-14	31-Dec-19	ONGOING	26,434,280.00	1,031,557.45
Reinvigorating the Philippine Coconut Industry through Coconut Somatic Embryogenesis Technology	Project 5. Mass propagation and pilot utilization of plumule-derived plantlets of Tall and Dwarf coconut varieties through CSet in selected coastal areas for Camarines Norte, Catanduanes and Sorsogon	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Coconut tissue culture through somatic embryogenesis is an alternative technique for mass propagation of coconut. The technology involves the use of plumules from mature coconut to produce true-to-type planting materials. The PCA-ARC developed a protocol on somatic embryogenesis using coconut plumule and has produced 80-120 seedlings from a single plumule. This protocol is currently being enhanced to increase production of more seedlings per plumule to as much as 1,000 per plumule using the high yielding tall and dwarf coconut varieties.	1. Improved propagation technique for in vitro culture of coconut using CSet 2. Upgraded tissue culture laboratories of participating institutions 3. Trained laboratory personnel on rapid production of planting materials through CSet 4. Increased the current 80-120 seedlings per plumule production through enhanced PCA CSet protocol to 1000 seedlings per plumule 5. Distributed quality planting materials to farmers	BU	The major beneficiaries are the smallhold coconut growers in Camarines Norte, Catanduanes and Sorsogon who are dependent on coconut farming as their livelihood.	1-Oct-14	31-Dec-19	ONGOING	25,262,092.00	1,907,812.00
Reinvigorating the Philippine Coconut Industry through Coconut Somatic Embryogenesis Technology	Project 6. Mass propagation and pilot utilization of plumule-derived plantlets of Tall and Dwarf coconut varieties through CSet for Zamboanga del Norte, ARMM and Region XII	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Coconut tissue culture through somatic embryogenesis is an alternative technique for mass propagation of coconut. The technology involves the use of plumules from mature coconut to produce true-to-type planting materials. The PCA-ARC developed a protocol on somatic embryogenesis using coconut plumule and has produced 80-120 seedlings from a single plumule. This protocol is currently being enhanced to increase production of more seedlings per plumule to as much as 1,000 per plumule using the high yielding tall and dwarf coconut varieties.	1. Improved propagation technique for in vitro culture of coconut using CSet 2. Upgraded tissue culture laboratories of participating institutions 3. Trained laboratory personnel on rapid production of planting materials through CSet 4. Increased the current 80-120 seedlings per plumule production through enhanced PCA CSet protocol to 1000 seedlings per plumule 5. Distributed quality planting materials to farmers	PCA	The major beneficiaries are the smallhold coconut growers in Zamboanga del Norte, ARMM and Region XII who are dependent on coconut farming as their livelihood.	1-Oct-14	31-Dec-19	ONGOING	27,691,134.00	1,606,357.64
Reinvigorating the Philippine Coconut Industry through Coconut Somatic Embryogenesis Technology	Project 6b. Nursery Establishment and Distribution of Coconut Seedlings in Mindanao	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	The project will initiate establishment of screenhouse and nursery at AROMAN Seed Garden, Carmen, North Cotabato. The establishment of seedling nursery shall be done accordingly to cater the coconut farmers that need replanting in their farms following the target production and distribution of somatic-derived plantlets of the program. The hardened seedlings from the nursery will be used primarily for planting in coastal locations as expansion areas, partly replacing senile palms and typhoon damaged palms in support to the 10-year replanting program of PCA. Identified varieties with resistance to diseases such as cadang-cadang and insect pest such as coconut scale insect shall be used in areas where infestations are prevalent.	1. Improved propagation technique for in vitro culture of coconut using CSet 2. Upgraded tissue culture laboratories of participating institutions 3. Trained laboratory personnel on rapid production of planting materials through CSet 4. Increased the current 80-120 seedlings per plumule production through enhanced PCA CSet protocol to 1000 seedlings per plumule 5. Distributed quality planting materials to farmers	PCA	The major beneficiaries are the smallhold coconut growers in Zamboanga del Norte, ARMM and Region XII who are dependent on coconut farming as their livelihood.	1-Oct-18	30-Sep-20	ONGOING	6,560,449.00	754,258.00
Reinvigorating the Philippine Coconut Industry through Coconut Somatic Embryogenesis Technology	Project Management and Coordination (PMC)	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	Coconut tissue culture through somatic embryogenesis is an alternative technique for mass propagation of coconut. The technology involves the use of plumules from mature coconut to produce true-to-type planting materials. The PCA-ARC developed a protocol on somatic embryogenesis using coconut plumule and has produced 80-120 seedlings from a single plumule. This protocol is currently being enhanced to increase production of more seedlings per plumule to as much as 1,000 per plumule using the high yielding tall and dwarf coconut varieties.	Efficient and effective program management and coordination.	PCA	Smallhold coconut growers who are dependent on coconut farming as their livelihood.	1-Oct-14	31-Dec-19	ONGOING	20,474,300.00	411,265.73
S&T-BASED SWEETPOTATO VALUE CHAIN DEVELOPMENT FOR FOOD IN TARLAC, ALBAY, AND TYPHOON YOLANDA-AFFECTED AREAS IN LEYTE AND SAMAR	Project 3. Sweetpotato Value Chain Development for Food in Albay	KRA 2: Poverty Reduction and Empowerment of the Poor and Vulnerable	1. To enhance the SP value chain for products (fresh-based MP products, noodles, ice cream, specialty breads, pastries) with high potentials for commercialization and access to wider market niche. 2. To strengthen the capacities of SP entrepreneurs, and the linkages/ partnerships with the BDS providers.	"1. At least four (4) SP food value chains with value chain analysis 1. At least five (5) SP varieties adopted by farmers for use in value chains 1. Employment generated in rural communities 1. Increase in SP area, ca. 500 has. 1. Provided BDS to the SP value chains 1. Knowledge products: SP flyers, publication, at least 3 papers "	DA Regional Field Unit V	Ācā,~Āc Local entrepreneurs (farmer-traders-processors) Ācā,~Āc Farming households (engaged in production of sweetpotato roots and planting materials whose livelihoods are limited by lahar-laden growing environment, insect pest and disease pressure) Ācā,~Āc Local organizations (including farmersĀcā,~ā,c cooperatives and womenĀcā,~ā,c s associations engaged in enterprises for processing and marketing of value-added sweetpotato products) Ācā,~Āc Consumers of quality sweetpotato products; threat of changing climate; Ācā,~Āc Local R & D institutions (Researchers/Scientists) for new knowledge and linkages Ācā,~Āc LGUs	1-Jan-16	31-Dec-18	ONGOING	6,164,410.00	577,812.50

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	Anatomical, Physical, Mechanical and Veneering Properties of Young-Aged Falcata (Falcataria moluccana (Miq.) Barneby & J. W. Grimes) and Yemane (Gmelina arborea Roxb.) (Old Title: Mechanical and Veneering Products of Falcata (Paraserianthes falcata L. Neilsen) and Yemane (Gmelina arborea Roxb) from Known Seed Source in Caraga Region)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Results of the study could significantly contribute to providing plantation growers/farmers and processors on the best rotation age for optimum utilization of the species and consequently in sustaining the acceptable raw material requirements of the industry particularly for construction purposes.	Year 1 i.; Determined the anatomical, physical, mechanical and veneering properties of falcata. i.; Determined the effect of various parameters on the recovery and quality of veneer such as rotary cutting using traditional lathe and spindles lathe, optimum combination of lathe setting, pre-treatment (soaking in hot water and steaming, veneer thickness, Knife angle and nosebar compression). i.; Determined the benefit-cost analysis of producing veneer at different ages. i.; Prepared report/brochures on veneer processing technologies for young-aged falcata Year 2 i.; Determined the anatomical, physical, mechanical and veneering properties of yemane. i.; Determined the effect of various parameters on the recovery and quality of veneer such as rotary cutting using traditional lathe and spindles lathe, optimum combination of lathe setting, pre-treatment (soaking in hot water and steaming, veneer thickness, Knife angle and nosebar compression). i.; Determined the benefit-cost analysis of producing veneer at different ages.	FPRDI	Farmers/plantation growers, wood-based industry (furniture, construction), academe and the general public as well.	1-Apr-18	31-Mar-20	ONGOING	4,998,999.00	2,016,785.80
	Assessment of Nursery and Field Growth Performance of Native and Exotic Plantation Tree Species in CARAGA Region	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The data to be collected shall be analyzed statistically to determine differences in growth performance with respect to root collar diameter, height and clear bole.	1. Best performing native species in terms of growth performance with respect root collar diameter (RCD), height and clear having the potential for commercialization as an ITP species; 2. Protocol on planting stock production and plantation development and management of native tree species identified as ITP species; 3. IEC material on native species with potential for plantation development (ITP species) 4. Native tree species' plantations developed to serve as seed orchards for further studies.	ERDB	Tree farmers, DENR, Wood industry	1-Feb-18	31-Jan-21	ONGOING	4,997,301.00	1,482,059.35
	Assessment of the Coppicing Characteristics of Lapnis (Broussonetia papyrifera) as a Strategy for its Control and Management and Sustainable Utilization for Pulp and Paper Production (Old Title: Development of High-value Paper and other Products from Juvenile Paper Mulberry (Broussonetia papyrifera) Trees)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	<p>The uncontrolled growth of paper mulberry or "Lapnis" in the Mt. Makiling landscape has gained notoriety due to its invasive character. Vacant and open areas within this region are slowly being dominated by the species, forming dense thickets threatening even the very existence of local and endemic species. As pointed out in the study of Florece and Colladilla (2006) paper mulberry is now widely dispersed around Mt. Makiling and its vicinities. It has also broadly spread in UPLB and in towns and cities outside UPLB campus such Bay, Calauan, Calamba City and San Pablo City.</p> <p>A present, many of these plants have grown into trees covering large patches of land and spreading profusely to other areas outside of the Mt. Makiling region. To stop this biological infestation, method of control is usually done thru actual cutting or harvesting of the matured trees. However, this approach only temporarily halts the plant growth as shoots starts to develop rapidly after harvest. The stumps after harvesting produce coppice or root suckers, which bear fruits upon reaching maturity, thus expanding its potential for regeneration. This lack of information on the coppicing behavior of Lapnis from cutting to sprouting to flowering has baffled local land owners on how to control and manage this species.</p> <p>Recently, FPRDI researchers conducted a study on the harvesting and utilization of its woody portion as raw materials for non-load bearing furniture and handicraft items. This also includes the production of wood-based charcoal briquettes and handmade paper products from its stripped barks. However, much of these efforts are into the utilization of the matured trees. Information on its coppice properties, yield and utilization were not included in the study.</p> <p>For centuries, like in many Asian countries the inner bark of paper mulberry,</p>	Data on the coppicing characteristics of Lapnis. Monitoring data on the stages of plant growth (i.e., cutting, sprouting to flowering). Data on the physical and mechanical strength properties of the pulp and paper produced from Lapnis harvested at various stages of growth. Technology for producing good quality bast fibers from juvenile Lapnis trunks; Technology on paper production.	FPRDI	Local stakeholders, domestic handmade paper producers and researchers.	1-Apr-19	31-Mar-21	NEW	2,991,222.00	1,877,386.00



Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status 'As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	Assessment of the Growth and Yield Performance of Rubber Planted in Non-Traditional Areas of the Philippines	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This study will assess the performance of rubber cultivated in non-traditional areas particularly in the provinces of Abra, Cagayan, Isabela, Nueva Vizcaya, Laguna, Quezon, Oriental Mindoro, Palawan, Negros Oriental and Southern Leyte.	Publications (No. of papers published/peer reviewed and IEC materials, citations) Information bulletin on the (1); manuscript for publication to ISI/Scopusindexed journal (1); Technical papers presented in scientific conference (2); Manual/GAP production guide for rubber in NTAs (1)  People services (# of MS and PhD graduated, # of trained personnel, value of public service contributed) Involvement of Project Staff as exposure and experience in the conduct a collaborative of the study : 1 PhD/MS (with experience on rubber research) 4 MS/Trained personnel (project staff) 2 BS Agriculture (with experience on rubber research)  Places and Partnership (MOA/MOU signed) MOAs/MOUs re Collaboration with DA-RFOs in Regions 2, 4A/B; NIR; VII; LGUs and rubber farmers/owners;  Policies Advocacy on the recommended GAP (including recommended clones, etc) for rubber planted in the NTAs. Policy incentives to farmers to invest in rubber farms establishment in non-traditional areas	DA-RFO 9 ZAMPIARC	Rubber stakeholders, research institutions	1-Oct-17	31-Dec-19	ONGOING	4,647,401.00	600,786.09
	Biological Studies of Economically Important Forest Vines in Camarines Sur and Albay Provinces (Old Title: Resource Survey, Inventory and Regeneration Study of Philippine Commercial and Potentially Commercial Forest Vines for the Handicraft and Furniture Industry)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project on forest vines aimed to address the increasing demand of raw materials for the handicraft industry in the Philippines. The department of Science and Technology - Forest Products Research and Development Institute (DOST-FPRDI) together with PCAARRD implemented and funded, a three-year project in the province of Cam Sur and Albay	Year 1: A list of forest vines and volume per project sites Year 2: Partial data on phenology and ecology of forest vines, as well as, increase in stem length and diameter of regenerants. Statistical analysis of factors affecting the growth and survival of forest vines. Year 3: A database of forest vines inclusive of photos, description, volume, maps, phenology, ecology, nutritional requirements, favorable environmental condition.	FPRDI	DENR, LGUs's, PO's, Academe/Universities, handicraft manufacturer, producers and collectors, general public	1-Apr-18	31-Mar-21	ONGOING	8,493,464.00	1,794,209.81
	Development of Decision Support System for Enhancing Climate Change Resiliency of Smallholder Upland Farmers in Selected Communities in CALABARZON, Philippines	KRA 5: Integrity of the Environment and Climate Change Mitigation and Adaption	Climate change is a real phenomenon, which poses threats to all aspects of human life. On a larger scale, the vulnerability of human societies and natural systems to climate extremes brought about by climate change is demonstrated by damages, hardship, and death caused by events such as drought, floods, windstorms and the like. Meanwhile, previous studies and literature claimed that climate change is already being experienced by the farming communities. Specifically, these researches proved the upland farming communities have observed erratic rainfall and temperature patterns which have affected the schedule of their planting season, higher incidence of pests and diseases, delayed fruiting and harvesting, lower crop yield, and higher farm labor costs. While there are uncertainties attached to estimates of such changes, some extreme events are projected to increase in the years to come, either in frequency or severity, due to the continuing changes of climate, so it is also expected that the severity, due to continuing changes of climate, so it is expected that the severity of the impact will also increase. It is hightime, therefore, to develop a decision support system that would lead towards an enhanced farmers' resiliency to climate change impacts. The proposed research generally aims to develop a decision support system that will lead towards building climate-resilient farming communities in CALABARZON, Philippines. Specifically, it aims to: a) assess the biophysical and socioeconomic characteristics of the selected watershed areas in CALABARZON; b) develop a GIS-based agroforestry land capability mapping scheme (ALCAMS); c) determine the potential impacts of climate change on land capability distribution; d) enhance technical capabilities of selected LGUs in climate proofing of GIS-based ALCAMS; and, e) recommend adaptation strategies to farming communities for higher resiliency to climate change. This research will basically revolve around developing a model of land capability distribution for agroforestry taking into consideration the different variables	- Baseline Information on biophysical and socio-economic characteristics - GIS-based land capability maps - Validated land capability maps - GIS-based land capability maps with climate change scenario Turn-over (i.e. gain and loss) Maps of land capability - Capacitated members of selected LGUs and local community in climate proofing - Publishable research outputs	UPLB	The beneficiaries of this Research and Development activity will include the following: 1) National Agencies and Local Government Units (LGUs) ' results of the project can serve as zoning of land uses for better planning 2) Residents of Target study sites (i.e. Smallholder Upland Farmers) ' well informed community for enhance resiliency 3) Policy Makers and Decision Makers ' results of the project can serve as zoning of land uses for better planning 4) Private institutions and individuals ' results of the project can serve as basis for future investments 5) Academe and other scientific/research institutions ' results of the project can serve as basis/reference for conducting similar research in other sites	1-Feb-17	31-Jan-20	ONGOING	4,980,220.00	1,210,573.85
	Development of Micro-propagation Protocol for Four Economically Important Bamboo Species in the Philippines	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project generally aims to develop an efficient, reliable and cost effective in vitro micro-propagation protocol for mass propagation of four economically important bamboo species in the country.	' Micropropagation protocol developed for the four economically important bamboo species. ' Sterilization procedure developed for each bamboo species. ' Culture media capable of generating maximum number of shoots per explant per subculture cycle per year for each bamboo species. ' Culture media capable of generating maximum number of roots per explant per subculture cycle per year for each bamboo species. ' Acclimatization procedure developed to establish seedlings capable of surviving in the field for each bamboo species. ' Most appropriate fertilizer for optimum growth of tissue-cultured plants under natural conditions and field performance of tissuecultured bamboo and their genetic stability. ' Cost of producing tissue culture plantlet, nursery grown plantlets and cost of field outplanting and maintenance for each bamboo species.	ERDB	1. Bamboo Farmers ' Provision of quality planting materials at low cost 2. Bamboo Industries ' Provision of adequate supply of raw materials 3. Researchers ' Provision of information on tissue culture of the 4 bamboos	1-Nov-16	31-Oct-19	ONGOING	4,664,164.59	433,658.53

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status 'As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	Development of Strategies for propagules and Shoot Production of Three Bamboo Species in Pampanga	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project generally aims to develop strategies and establish baseline information for propagules and bamboo shoot production. Through this project, it is expected to have enough supply of bamboo planting materials and a year-round supply of bamboo shoots in Magalang and nearby areas.	<p>â€¢ Identified the best method of propagating propagules</p> <p>â€¢ Improved survival rate by 50 to 70%</p> <p>â€¢ Determined the most appropriate method of irrigation for shoot production</p> <p>â€¢ Identified the suitable thinning regime for shoot production</p> <p>â€¢ Increased the bamboo shoot production from 6-7 shoots per clump per year to 10 shoots per clump per year</p> <p>â€¢ Identified the best material and method to prolong the shelf life of newly harvested bamboo shoots</p> <p>â€¢ Produced IEC materials (1,000 copies) on propagules propagation, thinning and water regime for shoot production and prolonging shelf life of newly harvested shoots.</p>	PSAU	Bamboo is a marvelous resource that provides a myriad of benefits for billions of people. Development of bamboo resources is economically assisting impoverished people while at the same time stabilizing erodible slopes and flood-prone watersheds. The ability to substantially accentuate rapid growth through intensive management for commercialization purposes magnifies its many benefits.	1-Aug-16	31-Jul-19	ONGOING	4,757,622.00	574,874.80
	Development of Tissue Culture Techniques(s) for Mass Production of Selected Bamboo Species	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The high demand for bamboo products and its ecological importance has led to the need for developing extensive bamboo farming. Despite this importance, production of most bamboo species lags behind its demand. Propagation of bamboo using seeds is low due to the long and irregular bamboo flowering cycle and scarcity of bamboo seeds. Propagation using suckers, culms and branches is similarly slow and for culm and branch cuttings, not yet well developed. To achieve this, in vitro regeneration of bamboo plantlets is needed. However, in vitro protocol is still lacking for economically important species of bamboo in the Philippines. Thus, there is need to develop a new protocol for rhizome induction which forms buds that develops into new culms or shoots easily. Shoot regeneration and rooting are key steps for in vitro micropropagation. An effective tissue culturing and nursery establishment protocols for bamboo will help stakeholders in extensive cultivation of bamboo and in cost-effective conservation of bamboo gene pool	<p>Year 1 &amp; Year 2 1; Established an effective, reliable and measurable protocol for micropropagation (i.e. best sterilization procedure plantlet regeneration and multiplication protocol and plantlet establishment) in comparison to existing conventional propagation for economically important bamboo species in the Philippines.</p> <p>Year 2 1; An effective protocol for establishing tissue culture plantlets in the nursery until the ready to plant stage for a year round availability.</p> <p>Year 3 1; Planting of regenerated bamboo in the field. Cost analysis of producing tissue cultured bamboo.</p> <p>Publication: 1 peer reviewed article and IEC material (brochures)</p> <p>People and Services: 1 BS or MS student to add to the scientific workforce</p> <p>Product: Tissue culture protocol on selected species of bamboo Tissue cultured planting materials Pilot demonstration farm for outplanted tissue culture plantlets</p>	VSU	Bamboo growers; Bamboo Industry	1-Jan-18	31-Dec-20	ONGOING	4,995,520.00	1,424,290.19
	Ecological Mangrove Restoration of Abandoned Brackishwater Fishponds in the Philippines	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project aims to determine the biophysical and social factors that contribute to the ecological mangrove restoration in the Philippine setting which will serve as basis to provide further inputs to the protocols for the ecological management of abandoned brackishwater fishponds. Specifically, it aimed to: 1) determine the effectiveness of science-based restoration techniques in the rehabilitation of abandoned brackishwater fishponds; 2) understand the dynamics of mangroves with associated soil and water characteristics in the ecological restoration of mangroves; 3) strengthen cooperation among government units, departments and local community in mangrove rehabilitation; and 4) improve protocol of ecological mangrove restoration and management in the Philippines.	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 Restoration 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	31-Mar-21	NEW	4,996,436.00	2,841,342.00
	Evaluation of the Physical and Mechanical Properties of Economically Important Forest Woody Vines	KRA 3: Rapid, Inclusive and Sustained Economic Growth	the project aims determine the physical and mechanical properties of economically important forest woody vines.	<p>Publications - Two (2) publications: 1. Leaflet on physical and mechanical properties of economically important forest woody vines 2. A booklet on forest woody vines in Quezon and Bicol Provinces for dissemination.</p> <p>Product â€¢ Basic Information on â€¢Physical and mechanical properties of Forest Woody Vinesâ€¢</p> <p>Patent - A copyrighted booklet on forest woody vines after project completion.</p> <p>People Services - At least 10 personnel trained on property testing of vines</p> <p>Places and Partnership (MOA/MOU) signed - Collaboration between and among industries, academe, government, and communities strengthened.</p> <p>Policiesâ€¢Research results can serve as significant inputs in the formulation of policies for identifying/classifying and utilizing forest woody vines species for furniture and handicrafts.</p>	FPRDI	<p>(a)Handicraft industry</p> <p>(b)Furniture industry</p> <p>(c)Researchers</p> <p>(d)Farmers</p> <p>(e)Academe</p> <p>(d) General public</p>	1-Jul-18	30-Jun-20	ONGOING	4,301,246.40	876,561.60
	Field Verification of Natural Fungicide from <i>Tasmania piperita</i> (Hook. F.) Miers against <i>Alternaria brassicae</i> of Lettuce and <i>Phytophthora Infestans</i> of Tomato (Field Testing and Piloting of Fungicide)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	An offshoot of the recently completed project on SCREENING INDIGENOUS PLANTS AS BIPOESTICIDES AND PRODUCT DEVELOPMENT FOR VEGETABLES AND SUGARCANE PESTS AND DISEASES. There is a need to mass propagate the plant by the use of seedlings and seeds in the nursery or by tissue culture as source of the fungicide	The biopesticide products can be recommended in use in Regions 10,11,12	CMU	<p>1. Farmers producing tomatoes and lettuce</p> <p>1. Consumers</p> <p>1. EDC personnel and farmers interested in planting <i>T. piperita</i> for livelihood</p> <p>1. Entrepreneurs interested in producing the natural fungicide</p>	1-Oct-17	31-Mar-20	ONGOING	4,998,214.00	581,141.75

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	Germplasm Conservation of Selected Indigenous Tree Species in Makiling Forest Reserve	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The research project focuses on addressing the need for both reforestation and meeting the increasing needs for timber and wood products, the development of seedling seed orchard to produce improved seeds for future plantations from superior planting materials is essential. The Philippines needs sufficient supply of superior quality timber to meet the increasing demand for wood and wood derived products but without placing too much pressure on harvest from natural forests, which are dramatically shrinking. A shortage in wood supply is expected if not enough plantations are established. Under the Master Plan, the projected raw material demand of wood-based industries in 2015 can only be met through plantations. There are several factors that affect the success of any planting activity. This includes low survival of the outplanted materials, which may be due to low quality of seeds or inferior planting stocks in the case of clones, poor site-species selection, absence of species trial, lack of documentation of seed origin, and absence of seed quality testing and technology (Lapis, 2006; Tolentino 2006). Thus, this project proposal was formulated to cater this need.	"Year 1 i.; 250 mother trees geo-tagged from the 25 selected species and seeds collected from 15 species based on phenology schedule (please refer to Table 3) i.; MOA between UPLB CFNR and NPGRl for germplasm conservation of indigenous forest tree species Year 2 i.; Seeds collected from additional 10 species i.; Spatial distribution maps of mother trees per species, with their phenology schedule, generated i.; Protocols for germplasm conservation of the initial 15 species collected (e.g. Seed viability and germination in relation to MC and storage time, Seed anatomy) Year 3 i.; Protocols for germplasm conservation for the remaining 10 species collected (e.g. Seed viability and germination in relation to MC and storage time, Seed anatomy) (Collection for next batch of selected species as commitment of CFNR) i.; 15 000 quality seedlings propagated from the 15 species i.; 10 000 additional seedlings propagated from 10 species i.; Distribution of 14400 quality seedlings to be planted in 36 hectares i.; Commitment of UPLB CFNR to institutionalize a germplasm conservation program for indigenous forest tree species i.; Distribution of 9400 quality seedlings to be planted in 23 hectares i.; MOA between UP Land Grant and UPLB CFNR i.; GIS map for Seedling Seed Orchards location i.; 15 hectares SSO established for the 15 species i.; GIS map of geo-tagged planted seedlings	UPLB	Farmers Researchers Academe	1-Mar-16	28-Feb-19	ONGOING	4,990,000.00	541,828.00
	Gluing and Finishing Characteristics of Thermally Modified Bamboo	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Thermal modification (TM is a technology for wood modification that has been commercialized in European countries and has spread in North America and Asia such as in China, Malaysia and Thailand. The use of TM technology in the Philippines utilizing bamboo has been studied by FPRDI and has a utility model for the process. TM treatment, such as the use of hot spent cooking oil or hot air with steam can influence gluing and finishing characteristics.	Reconditioned experimental TM chamber using steam; Fabricated hot oil-bath equipment (prototype); Determined the physic-mechanical properties of bamboo thermally modified in hot air in steam environment; determine the extractives content of the bamboo thermally modified in hot air in steam environment; determine the gluing and finishing characteristics of bamboo thermally modified in hot air in steam environment; started the exposure of the modified and control bamboo for field test against decay and insect attacks, prepared one publication for submission to ISI Journal	FPRDI	Bamboo Industry	1-May-18	30-Apr-20	ONGOING	4,997,422.40	781,265.60
	Improvement and Semi-Automation of the Furnace Type Dryer (FTD) for Lumber, Bamboo and Other Raw Materials of the Forest-based Industries	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The existing manually operated Furnace Type Dryer (FTD) was developed by FORPRIDECOM (now FPRDI) in 1978 thru NSDB's (now DOST) financial assistance. Due to its affordable cost compared to imported or steam heated lumber dryers it was well suited to the cottage and small-scale wooden manufacturers in the countryside. From its original design of 2.4 cu m capacity it evolved into larger capacities i.e. 2.50, 7.00, 12.00, 24.00 and 48 cu m. So far, FPRDI has installed 117 FTDs of various loading capacities in different regions of the country, 71 units are operational and 46 non-operational. The FTD is a versatile technology. Although it was designed for lumber drying, it has been used with slight modification of drying schedule for drying non-timber forest products (NTFP) such as bamboo, rattan, pandan, woody vines, etc. for furniture and handicrafts. The principle involved in the FTD operation has been applied by FPRDI researchers in developing other design of dryers for palay, corn, onion and water hyacinth. Drying Efficiencies (DE) of the 1,000 bd.ft. and 3,000 bd.ft. capacities FTD show low DE of 25% (ave.). Improving /Optimizing the dryer components will increase the DE by 20% (from 25% to 45%). Furthermore, drying time will be reduced by 20% (from 10 days to 8 days for 25mm thick yemane (Gmelina arborea). Likewise drying cost will be further reduced by 10% (from the current PHP8.00 to PHP6.50 per bd.ft.). The FPRDI needs innovative development of its technologies to broaden the choices of its clientele on kilns and dryers.	Year 1: i.; A 2.40 cu m capacity semi-automated FTD shall have been designed and constructed Year 2 i.; Lumber samples, bamboos and other materials shall have been collected for trial runs/performance evaluation i.; Conducted performance testing/evaluation of the developed FTD i.; Gathered data on heat balance and drying cost i.; Determined the technical and financial feasibility of the semi-automated FTD i.; Drying schedule of 2 tree plantation species and 1 bamboo species i.; Terminal report  Publications: Information Bulletin one (1) and articles (2) on Developed semiautomated Furnace Type Dryer (FTD) Patents: One (1) Patent application on the process/technology developed Products: Semi-automated Furnace Type Dryer for the lumber, bamboo and other raw materials for the forest-based industries People Services: Train personnel (15) on the operation of the developed semiautomated FTD Places and Partnership: FPRDI with 3 Lumber, bamboo and other raw material forest based industries partners/ cooperator Policies: Policy Advocacy (1) on Post harvest processing of Industrial Tree Plantation (ITP), and other NTFP is imperative to improve product quality	FPRDI	Lumber, furniture, handicrafts and non-wood forestbased industries	1-Jan-18	31-Dec-19	ONGOING	4,996,450.00	1,050,675.00

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	Practices of Entomophagy and Entomotherapy of Manobo Dulangan, Teduray and Tboli Ethnolinguistic Groups in Sultan Kudarat and South Cotabato, Mindanao, Philippines (Old Title: Practices of Entomophagy and Enotmotherapy by the Members of Manobo T'duray and T'boli Tribes in Sultan Kudarat and South Cotabato, Mindanao, Philippines)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project aims to expand the study on entomophagy along with entomotherapy particularly among the ethnolinguistic groups from Sultan Kudarat and South Cotabato, Philippines	<p>Year 1</p> <ul style="list-style-type: none"> <li>• Ethno-entomological data</li> <li>• Partnership with the three tribal groups</li> </ul> <p>Year 2</p> <ul style="list-style-type: none"> <li>• IEC Materials on the IKS in the use of insects for food and medicine</li> <li>• Research paper and brochure</li> <li>• Patent on tribe's knowledge particularly on the preparation of insect for food and medicine</li> <li>• Documented list of insects for food and medicine used by the Manobos, Tâ'durays and Tâ'bolis</li> <li>• Information dissemination/awareness on the potential of insects as source of food and medicine through LGUs</li> <li>• Policy recommendation on the protection and conservation of the three IP sites</li> </ul>	SKSU	Local communities of Senator Ninoy and Esperanza, Sultan Kudarat as well as Tâ'boli, South Cotabato; Local Government Units; NCIP; DENR Region XII; and Academe	1-Jun-18	31-May-20	ONGOING	4,702,223.76	1,042,526.80
Accelerated 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 the 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	<ol style="list-style-type: none"> <li>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)</li> <li>2. Patents - Copyrights of the IEC materials, including guidebooks, brochures, leaflets, etc. (Y2).</li> <li>3. Products - At least 10 copies of maps based on the georeference of collected plant samples; and established database for DNA barcodes on endemic flora (approx. 20 species) in Cebu Island KBAs (Y2)</li> <li>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)</li> <li>5. Places and Partnerships - MOA with selected stakeholders (LGUs, DENR, Academe) (Y1).</li> <li>6. Policy - Final information for policy recommendations and reports for LGUs for sustainable genetic biodiversity conservation (Y2).</li> </ol>	CTU	<ol style="list-style-type: none"> <li>1. Local Government Unit (LGU) = the endemic species can be showcased in their eco tourism to raise awareness of the richness of the biodiversity of the area. This can be an added attraction to the eco 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.</li> <li>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.</li> <li>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.</li> </ol>	1-Jul-19	30-Jun-21	NEW	4,997,444.80	3,632,681.40
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	NEW	3,996,800.00	968,450.00
Biodiversity and Vulnerable Ecosystems Research Program (BiVER)	Project 1. Biodiversity and Systematic Study of Organisms in Vulnerable Ecosystems	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Project sites are chosen for their vulnerability for climate change and to the increasing anthropogenic activities. The results from the 4 component projects will benefit using fishing communities and the LGU for future policy-making measures. The program also hopes to create awareness among the public about the need to protect the natural resources.	<p>Publication:</p> <ul style="list-style-type: none"> <li>a. Monograph publication</li> <li>b. Indexed publication</li> <li>c. Abstract in conferences</li> <li>d. Website</li> </ul> <p>Products:</p> <ul style="list-style-type: none"> <li>a. Knowledge base</li> <li>b. Module for workshop</li> </ul> <p>Services and People:</p> <ul style="list-style-type: none"> <li>a. Conference presentation</li> <li>b. Training</li> </ul> <p>Partnerships:</p> <ul style="list-style-type: none"> <li>a. DENR</li> <li>b. LGUs</li> </ul> <p>Policy:</p> <ul style="list-style-type: none"> <li>a. Policy advisory</li> <li>b. Policy recommendation</li> </ul>	PSHS-Eastern Visayas Campus	Fishing communities in Inopacan, Palompon and Tacloban City LGUs (Inopacan, Palompon, Panaon Island, Hilongos, McArthur, Ormoc) CENRO/DENR PSHS Scholars	1-Jul-18	30-Jun-20	ONGOING	1,642,890.00	320,145.00

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
Biodiversity and Vulnerable Ecosystems Research Program (BIVER)	Project 2. Assessment of Quality of Water Systems in Eastern Visayas	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Project sites are chosen for their vulnerability for climate change and to the increasing anthropogenic activities. The results from the 4 component projects will benefit using fishing communities and the LGU for future policy-making measures. The program also hopes to create awareness among the public about the need to protect the natural resources.	Publication: a. <del>M</del> onograph publication b. <del>I</del> ndexed publication c. <del>A</del> bstract in conferences d. <del>W</del> ebsite Products: a. <del>K</del> nowledge base b. <del>M</del> odule for workshop c. <del>G</del> eospatial maps Services and People: a. <del>C</del> onference presentation b. <del>T</del> raining Partnerships: a. <del>D</del> ENR b. <del>E</del> GU Policy: a. <del>P</del> olicy advisory b. <del>P</del> olicy recommendation	PSHS-Eastern Visayas Campus	Fishing communities in Inopacan, Palompon and Tacloban City LGUs (Inopacan, Palompon, Panaon Island, Hilongos, McArthur, Ormoc) CENRO/DENR PSHS Scholars	1-Jul-18	30-Jun-20	ONGOING	1,629,230.00	285,523.26
Biodiversity and Vulnerable Ecosystems Research Program (BIVER)	Project 3. River Flow Computational Modelling of the Binahaan River System in Leyte (Old Title: Computational Modelling of the Binahaan River System in Leyte for Flood Forecasting)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Project sites are chosen for their vulnerability for climate change and to the increasing anthropogenic activities. The results from the 4 component projects will benefit using fishing communities and the LGU for future policy-making measures. The program also hopes to create awareness among the public about the need to protect the natural resources.	Publication: a. <del>M</del> onograph publication b. <del>I</del> ndexed publication c. <del>A</del> bstract in conferences d. <del>W</del> ebsite Products: a. <del>K</del> nowledge base b. <del>M</del> odule for workshop c. <del>G</del> eospatial maps d. <del>R</del> iver morphology measuring device Services and People: a. <del>C</del> onference presentation b. <del>T</del> raining Partnerships: a. <del>D</del> ENR b. <del>E</del> GU Policy: a. <del>P</del> olicy advisory b. <del>P</del> olicy recommendation	PSHS-Eastern Visayas Campus	Communities around the Binahaan Watershed/River LGU (Dagami, Jaro, Pastrana) NDRRCC	1-Jul-18	30-Jun-20	ONGOING	991,375.00	163,793.02
Biodiversity and Vulnerable Ecosystems Research Program (BIVER)	Project 4. Development of Biodiversity and Vulnerable Ecosystems in Eastern Visayas Database and Website (Old Title: Development of the BIVER Database System and Website)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Project sites are chosen for their vulnerability for climate change and to the increasing anthropogenic activities. The results from the 4 component projects will benefit using fishing communities and the LGU for future policy-making measures. The program also hopes to create awareness among the public about the need to protect the natural resources.	Publication: a. <del>A</del> bstract in conferences b. <del>W</del> ebsite Products: a. <del>K</del> nowledge base b. <del>M</del> odule for workshop c. <del>D</del> atabase Services and People: a. <del>C</del> onference presentation b. <del>T</del> raining Partnerships: a. <del>D</del> ICT b. <del>A</del> STI	PSHS-Eastern Visayas Campus	Researchers in biodiversity and environmental science Students Public PSHS scholars	1-Jul-18	30-Jun-20	ONGOING	695,520.00	139,400.00

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status 'As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
Biodiversity Assessment for Sustainable Management in Key Biodiversity Areas of Central Visayas(Old Title: Biodiversity Assessment for Long-term Ecological Research in Key Biodiversity Areas of Central Visayas)	Project 1. Flora and fauna inventory and habitat characterization and assessment of ecologically important and highly threatened species in selected key biodiversity areas of Central Visayas (Old Title: Habitat Characterization and Assessment of Ecologically Important and Highly Threatened Flora and Fauna in Selected Key Biodiversity Areas of Central Visayas)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This research program aims to assess the biodiversity and characterize ecologically important flora and fauna in selected KBAs of Central Visayas.	Year 1  Publication •Initial draft layouts of flyer, brochure and other IEC materials 2 Conference proceeding papers (50%)  Products •Initial flora and fauna assessment reports of KBAs/project sites (50%) •Initial identification of selected KBAs/forests for rehabilitation (50%)  •Initial identification of rehabilitation strategies (50%) •Initial list of selected and geo-tagged mother trees for seeds collection (50%) •Initial IEC materials for a more effective and enhanced biodiversity conservation education campaign (50%)  People Services •1 trained research personnel/team members •At least 40 students trained on flora and fauna ID and field survey protocols •At least 5 trainings conducted (flora and fauna inventory and field survey protocol; biodiversity and habitat characterization and assessment; photo documentation protocol and field guide preparation; data processing and analysis; and basic GIS and map layout.)  Places and Partnership •MOA with selected stakeholders (LGUs, Academe, and NGOs)	BISU	1. Academic and Research Institutions of Central Visayas (CV); 2. Provincial and concerned Municipal LGUs in CV; 3. DENR (BMB and ERDB) and other government agencies; 4. Community Residents in KBAs; 5. Environmental Non-Government Organizations and Private Groups in CV; 6. PAMB and Watershed Management Councils in KBAs of CV; and 7. Other various stakeholders	1-Sep-18	31-Aug-20	ONGOING	10,981,369.48	1,638,817.53
Biodiversity Assessment for Sustainable Management in Key Biodiversity Areas of Central Visayas(Old Title: Biodiversity Assessment for Long-term Ecological Research in Key Biodiversity Areas of Central Visayas)	Project 2. Cave-dependent Bats Survey and Assessment in Key Biodiversity Areas of Central Visayas	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This research program aims to assess the biodiversity and characterize ecologically important flora and fauna in selected KBAs of Central Visayas.	Year 2  Publication •Six (6) peer reviewed journal articles (ISI-indexed, SCOPUS, Thomson Reuters, etc.) •At least 6 IEC materials (3 Field Guides to Flowering Plants and Ferns of the selected study sites/KBA sites; 3 Field Guides to Faunal Diversity of KBAs) •Final copies of flyers, brochures, posters, etc.  Patents •Copyrights of the IEC materials, including field guides/guidebooks, brochures, leaflets, etc.  Products •Updated data and information on floral and faunal diversity, population abundance, richness and habitat profile from the various KBAs •Updated database of information for Central Visayas KBA/IBA flora and fauna featuring conservation status •Provincial and regional maps of native, threatened and ecologically important flora and fauna of all KBAs (e.g. distribution and resources); •Three (3) Flora and fauna assessment reports of KBAs/project sites •Three (3) draft Sustainable Forest Biodiversity Management Plans for selected KBAs •Selected KBAs/forests for rehabilitation •Identified rehabilitation strategies	CTU	Beneficiaries of this Proposed Program include:  1. Academic and Research Institutions of Central Visayas (CV); 2. Provincial and concerned Municipal LGUs in CV; 3. DENR (BMB and ERDB) and other government agencies; 4. Community Residents in KBAs; 5. Environmental Non-Government Organizations and Private Groups in CV; 6. PAMB and Watershed Management Councils in KBAs of CV; and 7. Other various stakeholders	1-Sep-18	31-Aug-20	ONGOING	3,565,443.16	517,940.80
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	ONGOING	8,696,384.00	1,409,846.74
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	ONGOING	4,651,808.00	627,968.00

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status <sup>1</sup> As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
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	ONGOING	4,651,808.00	627,968.00
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	To pilot test the pheromone trapping system using the validated chemical compounds identified as sex pheromone for CPB and CMB and identified kairomone for oviposition attractant and feeding attractant for CPB and CMB, respectively.	1. Product – 1 bait/trap 2. Patent – Method of attracting using the developed formulation of the semiochemicals 27 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: for CMB Kairomone and Sex Pheromone (Region 2, Region 4 and Region 5) for CPB Kairomone and Sex Pheromone: Davao Region, Zamboanaga Region and Leyte. 6. Policies – Bio-based control strategy as component for integrated pest management of the cacao pest	DLSU	Cacao and Coconut farmers (cacao is usually intercropped with coconut) Farmers will be more technically efficient leading to increase cacao production with higher value and will generate more income for the farmers. Ⓙ Agricultural Technicians Can greatly improve the capacity of agricultural technicians to achieve positive impacts on smallholder farmers throughout the Philippines. Ⓙ Pest Control Companies Development of biocoating agents against pests attacking cacao pods for commercialization. Ⓙ Cacao Traders / Processors / Food and Wellness Markets More production of cacao and of good quality beans will place Philippine Cacao Industry high competitiveness in the international market.	1-Oct-19	30-Sep-21	NEW	6,022,450.00	3,746,663.00
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	To develop efficient strategy in the use of biological control agents to manage the population of CPB and CMB	1. Product – biocon agents 2. Patent – artificial diet for rearing the spiders 3. Publication – at least 2 publications 4. People Services – 1 graduate student and 50 trainees 5. Places and Partnerships –. Cocoa Foundation of the Philippines Inc. DA-Regional Offices, Bureau of Plant Industry (BPI) 6. Policies – Biobased control strategy as component for integrated pest management of the cacao pest	DLSU	Ⓙ Cacao and Coconut Farmers (cacao is usually intercropped with coconut) Farmers will be more technically efficient leading to increase cacao production with higher value and will generate more income for the family. Ⓙ AgriculturalTechnicians Can greatly improve the capacity of agricultural technicians to achieve positive impacts on smallholder farmers throughout the Philippines. 44 Ⓙ Biological Control Rearing Facilities Development of mass rearing protocol for the most efficient biological control agents of CPB and CMB of 44ehavior44 value Ⓙ Cacao Traders/Processors/Food and Wellness Markets More production of cacao and of good quality beans will place Philippine cacao industry high competitiveness in the international market.	1-Oct-19	30-Sep-21	NEW	5,531,345.00	3,405,047.00

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
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	To develop the particle film technology for managing the population of major insect pest and diseases attacking cacao pods and explores more the agricultural benefits from all locally available food grade clay minerals.	1. Product – formulated particle film 2. Patent – patent application for Zeolite as coating agent for pest repellency 3. Publication – 2 publications (Combined effect of particle film and BCA for insect pest management and for diseases 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; Central Bicol State University of Agriculture; Sultan Kudarat State University; Isabela State University; Cagayan State University; DA- Regional Offices; DAAAttached Agencies; DA- Local Government Units 5. Policies – Biobased control strategy as component for integrated pest management of the cacao pest	DLSU	☐ Cacao and Coconut Farmers (cacao is usually intercropped with coconut) Farmers will be more technically efficient leading to increase cacao production with higher value and will generate more income for the farmers  ☐ AgriculturalTechnicians Can greatly improve the capacity of agricultural technicians to achieve positive impacts on smallholder farmers throughout the Philippines.  ☐ Pest Control Companies Development of biocoating agents against pests attacking cacao pods for commercialization 75 ☐ Cacao Traders/Processors/Food and Wellness Markets More production of cacao and of good quality beans will place Philippine cacao industry high competitiveness in the international market.	1-Oct-19	30-Sep-21	NEW	4,727,335.00	2,591,667.00
Philippine Forest Vines for Handicraft and Furniture Industry	Treatability and Performance of Commercial Forest Woody Vines Using Chemical and Organic Preservatives	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This study will apply alternative source of wood preservatives from natural materials like the cashew nut shell liquid. Samples of forest woody vines will be treated with formulated organic preservative from CNSL and chemical preservatives.	This project is expected to come up with data and information on the appropriate preservative treatments for commercial forest woody vines and its products which includes among others the treatment time and preservative concentration suitable to forest woody vines.	FPRDI	non-wood using industries, collectors/farmers, researchers	1-Jun-18	31-May-20	ONGOING	4,999,456.00	902,212.80
Value Adding and Waste Recovery for Industrial Tree Plantation Species (ITPS): Forest Nanotechnology Interventions and Bioplastics Production	Project 1. Production and Application of Cellulosic Nanocrystals from the Wood and Processing Wastes of ITPS	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The proposal will explore, with the use of nanotechnology, alternative potential products that can be developed from ITP species, either from solid timber or from wastes generated from their processing	Publications - 2 articles in ISI journals - 1 technical bulletin - citations of peer-reviewed articles - project terminal report Patents - invention disclosure/patent for extraction/production of nanocellulose from fast growing timber - invention disclosure/patent for fabricating nanocellulose-reinforced composite Products - invention disclosure/patent for extraction/production of nanocellulose from fast growing timber - invention disclosure/patent for fabricating nanocellulose-reinforced composite People services - 1 MS Forest Products Utilization with specialization in Forest Nanotechnology by 2019 - 2 BS Chemical Engineering and 2 BS Chemistry students (2017-18) - 1 trained personnel (project staff) Places and partnership - upgrading of FPPS Wood Chemistry laboratory; - MOU signed with 1 company in need of nanocellulose as feedstock for a start-up project on nanocellulose-reinforced composites Policies - Draft policy that provides incentives for the utilization of wastes from plantationgrown timber	UPLB	- Farmers planting fast-growing timber - Industries in need of raw materials for novel composite products - Downstream manufacturing enterprises using novel composite materials	15-May-17	15-May-20	ONGOING	2,774,840.00	312,887.20
Value Adding and Waste Recovery for Industrial Tree Plantation Species (ITPS): Forest Nanotechnology Interventions and Bioplastics Production	Project 2. Bioplastics from ITPS: Production, Characterization and Potential Applications	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project will deal with the utilization of lignin as a by-product of pulping ITPS which is a pre-treatment step in the production of cellulosic nanocrystals	Publications: Manuscript for publication to ISI/Scopus-indexed journal; Production of information bulletin; Technical papers presented in scientific conference Patents: One patent/utility model for filing for the protocol for the production of bioplastic with unmodified/modified lignin Products: Lignin-based bioplastic (film/board) People Services: Involvement of at least one BS Chemical Engineering student as mentee/ thesis advisee; 1 MS Forestry/Chemistry/Chemical Engineering student as RA or advisee; Involvement of one junior faculty as Project Staff Places and Partnerships: Collaboration with PhilFIDA, wood processors and/or its association Policies: Advocate the use of bioplastic from lignin derived from ITP logging wastes	UPLB	Forest-based industries, tree plantation farmers, manufacturers of polymers and plastics	15-May-17	14-May-19	ONGOING	2,255,115.00	422,151.20



Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	Amaranthus spinosus Leaf Meal as Potential Protein Source for Nile Tilapia (Old Title: Utilization of Amaranthus spp. Weed as an Alternative Feed Ingredient for Tilapia Aquaculture)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The utilization of Amaranths spp. as promising sources of lowcost feeds ingredients will play a major role in increasing aquaculture productivity. The protein content of Amaranth grain is much higher than other grains like wheat and rye (Torane et al., 2017). It has been estimated that amaranth leaves have similar nutritional composition than green leafy plants such as spinach and many others (Mujica and Berti, 1997), and it contains an appreciable amount of proteins, fat, fiber, carbohydrate and calorific value, mineral elements, vitamins, amino acids (Akubugwo et al., 2007). The chemical analysis of this plant shown that it has high amount of protein (30-32%) with lysine constituting as much as 5.9% (Emokaro and Ekunwe, 2007). In addition, Amaranth is gaining acceptance, and it is being rediscovered due to its nutritional characteristics (Borneo and Aguirre, 2008) and one of the rich sources of organic resources, has received attention for its control as well as utilization. The proposed research is expected to produce quantitative result on the nutritional quality of Amaranthus spinosus Leaf Meal (ASLM) for growth performance, nutrient utilization, carcass quality, proximate composition and digestibility of Nile tilapia ( <i>Oreochromis niloticus</i> ).	1. Publication 4 Scientific papers for ISI/Scopus and other International refereed journals 1 Paper Presentation to scientific conference 2. Products 1 Amaranthus spinosus Leaf Meal 1 Amaranthus spinosus Protein Concentrates 3. People and Services 30 Fishfarmers trained on the utilization of Amaranthus spinosus leaf meal in feed for Nile tilapia 2 MS students 2 Ph.D. students 4. Places and Partnership 1 MOU 2 Experimental sites established	ISU, USC	Research and Academic Fisheries Institutions, Extensionist, Tilapia hatchery operators/growers and policy makers	1-Oct-18	30-Sep-20	ONGOING	4,950,318.00	1,360,088.25
	Application of exogenous metabolites in improving soft-shell mangrove crab production (Old Title: Biotechnological Strategies in Improving Soft-shell Mangrove Crab Production)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	1. Establish protocols and technologies using metabolites directly involved in the monitoring process to hasten and synchronize mangrove crab molting for soft-shell crab production. 2. Determine basal amounts of applied exogenous metabolites for induced molting (for food safety/quality concerns) 3. Elucidate the effect of applied exogenous metabolites on the overall metabolic pathways involved in molting for better stock management 4. Test developed molting strategies with identified adaptors for soft-shell crab technology developed by SEAFDEC-AQD	1. Protocols and technologies for the mode of delivery, and frequency of application of exogenous biological metabolites for optimum molting rates. 2. Formulated feed with identified compound with the most active effect on precocious molting of soft shelled crabs. 3. Increased precocious molting rate of marketable size soft-shell mangrove crabs (50-80 grams) by 50% 4. Acceptable levels of residual exogenous compound application for human consumption 5. Rapid method for determining product quality (UV-VIS) 6. Trained fisherfolk (KASAMA members) involved in soft-shell crab production to use developed strategies 7. Improved production rate of soft-shell crabs (~40-50%)	UPV	1. Small scale farmers/fisherfolk as future adaptors of soft-shell crab technologies. 2. Current adaptors of soft-shell crab technologies.	1-Dec-18	30-Nov-20	ONGOING	4,997,018.00	973,983.00
	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 3: Rapid, Inclusive and Sustained Economic Growth	To develop a cost-effective automated UPV large scale recirculating depuration system with the BPSU MADS technology.	Publication: 1 scientific paper, 1 IEC Material, 1 photo manual/ user's guide for the MADS technology  Patent: Utility Model MADS Product: Mussel Automated depuration System (MADS) People and Services: 5 undergraduate students, One training (15 participants) Places and Partnership: MOA between BPSU and UPVCFOS , BFAR 3 and LGU Bataan	BPSU	Beneficiaries include mussel farmers, entrepreneurs, processors, researchers, technicians/extensionists, policy makers, and consumers	1-Oct-19	31-Mar-21	NEW	4,064,121.64	476,396.94
	Development of Colloidal Gold Nanoparticles (AuNPs) Immune Assay for Rapid Detection of Bacterial Pathogens in Freshwater Tilapia Aquaculture (Old Title: Development of Colloidal Gold Nanoparticles (AuNPs) Immune Assay for Rapid Detection of Different Bacterial Pathogens Causing Disease Problems in Nile Tilapia Industry)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will be implemented with two phases: For Phase 1, this stage will focus on the development and optimization of colloidal gold nanoparticles (AuNPs) immune assay detection kit for rapid detection of different bacterial pathogens causing disease problems in Nile Tilapia industry with 4 major activities that will be done as follows: 1) Isolation of different bacterial pathogens infecting Philippine tilapia industry; 2) standardization and optimization of polyclonal antibody production of each isolated pathogenic bacteria; 3) development and optimization of colloidal gold nanoparticle to be used as immune assay in the detection of different isolated pathogenic bacteria; 4) development and optimization of the protocol on the use of colloidal gold nanoparticles as rapid detection kit for the different bacterial pathogens in tilapia. For Phase 2, the project will focus on the prototyping, laboratory and field testing of the developed detection kit (RDK). Two major activities will be done including evaluation on the efficiency and accuracy of the detection kit and determination/optimization of the shelf-life of detection kit developed. The economics of production on the use of the developed products will also be determined after the laboratory and on farm testing trials.	1. Publication: 1 Paper for presentation in the Scientific Forum, 1 Paper for publication in the Scholarly Journal 2. Patent: 1 Patent on Colloidal Gold Nanoparticle Immune Assay Detection Kit 3. Products: 1 Rapid Detection Kit against specific bacterial pathogens in tilapia 4. Places/Partnership: 3 Partnerships (DMMSU, ISU, and BFAR) 5. People/Services: 2 Undergraduate Students, 1 Graduate Student	CLSU	Tilapia farmers, researchers, educators, extension workers, students, consuming public	1-Jun-18	31-May-20	ONGOING	4,996,472.00	978,564.88

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status <sup>1</sup> As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	Development of Cost-effective nano(zeolite-silica) Composites for the Removal of Pollutants from Water and Soil for Freshwater Tilapia Aquaculture (Old Title: Development of Cost Effective Nano Materials for the Removal of Pollutants from Water and Soil Tilapia Aquaculture Production)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will be focused in the development of nanochar for aquaculture purposes. The selection of various indigenous materials suitable for the production of nanochar that can be used for the aquaculture industry will be the first phase of the project.	1. Publication: 1 Publication in a scholarly journal (ISI, Scopus Journal), 1 Paper presentation to scientific Conferences 1 IEC on Production of nanoremediation of soil and water for better tilapia production 2. Product 1: Pelletized nano (zeolite-silica) composite Char 3. Patent: 1 Nanochar product 4. People and Services: 2 MS and 1 PhD 5. Places and Partnership: ISU Experimental Station, CLSU-CF, BFAR	CLSU	Tilapia farmers, researchers, educators, extension workers and students	1-May-18	30-Apr-20	ONGOING	4,998,937.00	1,047,804.00
	Ecology and distribution of the invasive mussel species, Mytella charruana, in the Philippines (Old Title: Ecology, Distribution and Potential Uses of Invasive Mussel Species in the Philippines)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The primary aim of this study is to determine the distribution and ecology of potentially invasive mussel species (Mytella charruana) in Philippine waters, the impacts of this species on mussel growers, and how local government units respond to such phenomena and the resulting, if present, utilization of local communities of this species.  Field studies on the competition of invasive with other bivalves such as Perna virides and Crassostrea iredalei will also be conducted in sites with existing and suspected presence of invasive species.  This study will also be an excellent opportunity to examine local and national policies in occasions when presence of invasive species with commercial value is discovered in Philippine waters.	1. GIS maps on the distribution and occurrence of invasive bivalve species in the Philippines 2. Information on some aspects of the biology and ecology of Mytella charruana 3. Information on utilization of the potentially invasive species 4. Information/Inputs to the Management Plant/S&T Plant for Invasive mussel species	UPV	mussel farmers, LGUs. NGAs, policy makers, academic, research institutions, and consuming public	1-Mar-18	29-Feb-20	ONGOING	4,250,712.00	1,228,017.60
	Enhanced Aquaculture System for Genetically-Improved farmed tilapia (GIFT) Towards Improved reproductive Performance of Broodstock and Sustainable Supply of Quality Fry and Fingerlings	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Despite the fast-growing trait exemplified among GIFT strains, several constraints are associated with the reproductive performance of the GIFT. The seemingly poor reproductive performance of the GIFT was also reported by Yoshida et al. (2015), Ansah et al. (2014), Biswas et al. (2014) and Campos-Mendoza et al. (2004). Large number of broodstock are thus required to offset the problem on low reproductive performance to produce quality fry and fingerlings and poor survival to reach to marketable size which poses positive impact on the efficiency and profitability of tilapia industry in the country. Therefore, aquaculture scientists and researchers are encouraged to optimize and improve the current culture strategies that could best enhance the health and nutritional status of the GIFT for improved reproductive performance.	Publications: 1 Peer-reviewed journal articles 1 Manual on Broodstock Management (1) 1 Manual on Culture System for Fry/Fingerling Product: 1 Enriched aquafeed formula for broodstock 1 Alternative aquafeed formula for fry/fingerling Patent Utility Models: 1 Enriched broodstock aquafeed 1 Alternative fry/fingerling aquafeed People and Services Student Mentorship Training of broodstock operators Places and Partnerships: UP Visayas/UPLB-Biotech Central Luzon State University GIFT-Feed Mix Broodstock Hatcheries	LSPU	Hatchery & Grow-out Operators/ Fishfarmers, Students, Researchers, and Extensionists	1-May-18	30-Apr-20	ONGOING	4,994,854.00	1,222,417.35
	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 3: Rapid, Inclusive and Sustained Economic Growth	To evaluate the performance of IMTA as an approach to disease and environmental management towards the development of a sustainable and ecologically balanced Penaeus monodon aquaculture technology	Increased production by 10-15% from baseline production of 0.5-1.0 ton/hectare/year Soil and water quality profile in IMTA pond-based aquaculture systems in P. monodon Bio-economics of an IMTA pond-based shrimp farming/technology Biological pond profile (pathogenic and non-pathogenic microbial species, microalgal species) Pond-based IMTA protocol for P. monodon culture Reduced commercial feed cost of up to 30% from the baseline production of 60% of the total production cost, hence increase profitability 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	30-Sep-20	NEW	12,028,364.38	3,713,973.54
	Evaluation of provitamin B1 as agent to reduce feed cost of practical diet of the Nile Tilapia and Milkfish (Old Title: Evaluation of Benfotiamine as Agent to Increase Carbohydrate Utilization in the Nile Tilapia and Milkfish)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will be done in two years. During the first year, initial evaluation will be conducted on the Nile tilapia and milkfish. Fish fry will be fed the control diet with a normal carbohydrate amount of 30%, a diet with high carbohydrates (HC, 45%) and a diet with HC (45%) supplemented with provitamin B1. The control diet will contain about 30% protein, 30% carbohydrates and 4000 kcal kg-1 energy while diets HC and HCB with 45% carbohydrates. All the rest of the ingredient will be similar except carbohydrate content and the provitamin B1 added at 3.0 %. Parameters to be estimated will be growth (final body weight, weight gain and specific growth rate), feed utilization efficiency (food conversion efficiency, protein efficiency ratio, lipid and protein deposition), glucose tolerance test (GTT) and stress test (ammonia, extreme salinities, temperature) to know whether provitamin B1 also results in enhanced immune response in the Nile tilapia and milkfish. Changes between the transcriptome of each treatment will also be monitored by RNA-seq.	1. Publication 2 Publications in an ISI or peer-reviewed journals 2 Paper presentations to scientific Conferences 2. Product Formulated feeds with provitamin B1 3. Patent (none yet) 4. People and Services 1 MS Student 5. Places and Partnership (none yet) 6. Policy (none yet)	UPV	Tilapia and milkfish fish farmers, researchers, extension workers, and students	1-Jul-18	30-Jun-20	ONGOING	4,819,091.20	1,040,525.80

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	Evaluation of vinegars as growth promoter and immunostimulant in the Pacific white shrimp	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will be done in 2 years. Separate trials will be done to study the effects of the TV and SV on the immune response of shrimp against Vibrio parahaemolyticus. The effects of each of the two native vinegars on the transcriptome profile will be determined by RNA sequencing using Next Generation Analysis.	1. Information on total phenolic, flavonoid and volatile compounds; 2. Optimum dietary levels of TV and SV 3. Effects of the two vinegars on the immune response of the white shrimp against the pathogen 4. Effects of the two vinegars on the genes of the digestive enzymes trypsin, chymotrypsin and $\alpha$ -amylase of the white shrimp 5. Effects of the 2 vinegars on the transcriptomic profile of the white shrimps following challenge tests	UPV	Fisherfolks, feed industry, researchers, scientists, general public and science	1-Aug-17	31-Jul-19	ONGOING	4,178,548.40	815,530.20
	Improvement in the Hatchery and Nursery Production of Green Mussel (Perna viridis) (Old Title: Project 4. Increasing Survival of the Green Mussel (Perna viridis) Larvae and Juveniles through Improved Water and Food Facilities)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project aims to secure a reliable source of hatchery produced seed to augment the supply of mussel spat for grow-out production. The hatchery protocols by Aquacop, Saleh and Tahi and Blueseed with some modifications made in our DOST-PCAARRD funded mussel project will be used for seed production. Mass production of the mussel seeds until juvenile stage more than 2 cm will be carried out.	1. Improved natural food and water facilities in mussel hatchery; 2. Increased survival of the green mussel from fertilized eggs 3. Improved technology of holding spat in the nursery prior to seedling them to grow-out farms; 4. Improved mass production of apparently healthy hatchery-produced green mussel seeds 5. Evaluated the growth and survival of the F1 hybrid	UPV	mussel growers	1-Oct-17	30-Nov-19	ONGOING	4,999,980.00	1,191,761.00
	Improvement of Philippine Penaeus vannamei for Enhanced Growth and White Spot Syndrome Virus Resistance through Selective Breeding	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Philippine shrimp aquaculture is one of the fastest and highly profitable economic activities	1. Culture of foundation families of P. vannamei 2 from North America (1 from Philippines) established in the Philippines. 2. Optimized broodstock rearing, breeding, and hatchery protocols for P. vannamei in the Philippines developed. 3. P. vannamei broodstocks exhibiting traits of better growth performance, and enhanced resistance against WSSV, produced for distribution to shrimp hatchery operators in the Philippines.	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-21	ONGOING	29,881,443.00	2,567,449.00
	Mangrove Crab (Scylla serrata) Production in Alabat Island, Quezon Province Using an Aquasilviculture System	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The contribution of this technology relative to productivity and profitability will be analyzed. Pond culture will be used as basis of evaluating the effectiveness of the technology under study.	A. Benefits of aquasilviculture technology B. Profitability analysis of the production performance of mangrove crab in aquasilviculture system C. Acceptability of aquasilviculture technology by the community	SLSU	Coastal communities, marginal fishers of Alabat, Quezon, farmers, environmentalist, researchers, medical practitioners, different sectors of the community	1-Sep-17	31-Aug-19	ONGOING	4,466,737.00	495,169.91
	Padina sp. (Lap-lapayag) as an Alternative Immunobooster for Tilapia Health Management	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Use of immunobooster is a unique approach for fish culturists as they undertake methods of controlling disease losses in their facilities. The interest in using this approach is heightened by the problems of viral, bacterial, parasitic and fungal diseases that are limiting factors in culture at many fish farms, hatcheries, and aquaculture stations. Moreover, a serious problem is that few approved chemotherapeutics agents are available for use in food fish because of growing concerns for consumer liability and for accumulation of substances in the environment. Use of antibiotics in fisheries is extensive, and there is concern about increases in antibiotic-resistant strains of bacteria in the aquatic environment surrounding locations where the drugs are used. Indeed, while these antibiotics effective in the treatment or control of some diseases agents, additional methods are needed to control these and other fish diseases. Problems with present antibiotic, drug, and chemical treatments to prevent diseases in fish, set the stage for this newly concept in disease prevention. The proposed research is expected to produce quantitative result on the utilization of Padina sp. as an alternative immunos booster for tilapia health management. It is assumed that the introduction of Padina sp. extract via immersion, injection or oral administration will enhance the survival, immune response, and haematological parameters, increase resistance against bacterial infection, and enhance stress response of tilapia.	1. Product a. Hot-water Extracts of Padina 2. Publication a. Produce 4 research article for publication for ISI/Scopus and other International refereed journals b. At least two paper presentation to scientific conference 3. People and Services a. Trained at least 30 fisherfolk on the utilization of Padina sp. as an Alternative Immunobooster for Tilapia Health Management 4. Partnership a. Forged at least one linkage/partnership 5. Places a. Established 1 concrete experimental set-up	ISU	Fish farmers, researchers, consuming public	1-Apr-18	31-Mar-20	ONGOING	4,939,332.00	1,276,538.50
	Pilot Testing of Probiotics and Prebiotics from Agricultural Wastes for Improved Tilapia Pond Culture (Old Title: Pilot Testing of Probiotics and Prebiotics from Agricultural Wastes for Improved Tilapia Culture and Management)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Supplementation of these feed additives in fish diets can help optimize protein utilization which could decrease the amount of feed necessary for fish growth and lower production costs. The results can be validated in an on-farm situation through pilot testing. The pilot testing of probiotics and prebiotics showed a high potential for improving the growth performance, survival rate and feed utilization of tilapia to increase farmers' income.	1. Increase of 10% in survival rate (Survival rate from 60% to 70%) 2. Body weight of 200 g at the end of grow-out 3. Water quality is within the standard (BOD < 20 ppm; pH 6.5-9; NO3-N <10 ppm; NH3-N< 0.02 ppm; DO 1.4-5 ppm)	CLSU, PSAU, DMMMSU	Fish farmers, researchers/students, onion growers, and feed companies	1-Feb-18	31-Jul-19	ONGOING	3,625,917.00	548,945.64

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status 'As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	Pilot tests on incorporating the filamentous green algae Rhizoclonium riparium in the diet of Nile tilapia (Old Title: Farm Trials on Incorporating the Green Seaweed Rhizoclonium in the Diet of the Nile Tilapia)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will be done in two years. During the first year, production of Nile tilapia will be done in two areas, namely, in Pangasinan State University in Luzon and in Aklan State University Makato campus. The commercial feed for Nile tilapia and commercial feed with Rhizoclonium riparium meal as well as a treatment without feed will be compared during and after one production cycle. The groups of fish that will not be offered any formulated feed will provide estimate of the contribution of natural feeds to the growth of the fish. Feeding scheme (feeding rate, feeding frequency, time of feeding) will follow the existing current practice in commercial Nile tilapia production. After the fish reach a desired marketable size, growth (final body weight, weight gain and specific growth rate) as well as feed efficiency (food conversion ratio, nutrient deposition) will be compared. Simple cost and return analysis will also be done. Feeding rate will be optimized in the laboratory during the first year and will then be pilot tested during the second year. Two feeding schemes will be tested in two separate production cycles	1. Profitability of incorporating the filamentous green algae meal in the diet of cultured Nile tilapia at two farm sites; 2. Optimized feeding rate and cyclic feeding scheme for the diet with the algae meal with the greatest profitability increase.	UPV	The aquaculture industry, particularly tilapia growers will benefit in terms of reduced costs of feed inputs	1-Apr-18	31-Mar-20	ONGOING	4,684,433.20	2,113,047.79
	Pilot-testing an LGU-based Common Service Mussel Depuration Facility (Old Title: Pilot Testing the Mussel Depuration Facility and its Operation Management Plan in Bacoor City (Establishment of an LGU-led Mussel Depuration Facility))	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project proposal is a continuation of the newly completed project "Program B, Project 5: Production of Safe Mussels Using Environment-Friendly Culture Methods in Sites Near Urban Areas" (Pugay, 2018) implemented in Bacoor Bay. The completed project had established the advantage of longline culture method versus the traditional stake method, profiled the seasonal variations of the environmental parameters of Bacoor Bay, and had established a depuration facility in Bacoor City. This project will focus on the pilot testing of the mussel depuration facility in Bacoor Cavite by using the grown mussel in longline and stake method. It aims to assess the robustness of the depuration process and protocol, determine the financial viability using various marketing strategies for sustainability of the project. The will also pilot test the operation management manual output of the initial project to have a proper turn over of the facility. This project is in cooperation with DOST-4A who would like to make the depuration process a mandatory pre-processing activity of their Mussel Processing Project. Further, the LGU of Bacoor is planning to integrate the Mussel industry into their tourism plan. They are establishing a "Mussel Tour" involving a stopover in the Mussel Depuration Facility to highlight their effort on producing quality mussels. The cooperation of these institution ensures the sustainability of the facility thus the need to institutionalize the depuration operations in Cavite.	1. Food Safety Certificate from BFAR-NFRDI 1. Financial Plan for depuration (Cash flow plan, profit plan, production and cost plan, and loan access plan) 1. Marketing Plan for depurated mussel from Bacoor Bay 1. Refined Operational Management Manual for Bacoor City Depuration Facility 1. IEC materials	CvSU	Beneficiaries include mussel farmers, entrepreneurs, vendors, middleman, processors, researchers, technicians/extensionists, policy makers, and consumers.	1-Jan-19	30-Jun-20	NEW	3,981,200.00	2,787,625.00
	Project 4: Pilot Scale Production of Primary Processed Philippines Green Mussel, Perna viridis	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project is the next phase of the primary processing project (Project 2) of the Post Harvest Program for Sustainable High Quality Mussel Products Program. The developed protocol for cleaning and live handling/transport of mussel as well as the process of blanching and use of additive for the development of primary processed mussel products (i.e., chilled-and-frozen-blanching whole, half-shell, and shucked mussels) will be tested at pilot scale level.  Pilot scale production is an intermediate step between bench-scale production and full-scale commercialization. It is scaled-down version of the commercial operation, which aims to evaluate the efficiency of the developed technology when run in bigger volume. Subjecting the developed technologies at pilot scale level before going full scale at commercial level will identify and address many possible problems that can be encountered during technology commercialization.	Year 1 1. Verified and optimized protocols at pilot scale production (100-200kg mussel input per production cycle) of chilled (blanched, in shell) and frozen (blanched, in shell; and blanched, half-shell);  Year 2 2. Information on mussel product quality at pilot scale production; 3. Time and motion data for 100 kg and 200 kg mussel inputs per cycle per product; 4. Product quality and nutritional profile of chilled and frozen blanched mussels; 5. Product shelf life/'Best before date' of each product optimized; 6. Financial and economic viability of the products (Cost and return sensitivity analyses); and 7. Verified business plan for the establishment of small-scale mussel processing plant engaged on primary processed chilled and frozen mussel products	UPV	The results of the project will be beneficial to improve the Export Market, Food Processing Industry (Medium/Large-scale), Small-scale Enterprise or Village Processors, Hotels, Restaurants, and Fish & Fishery Product Retailers	1-Apr-18	31-Mar-20	ONGOING	4,999,828.00	881,745.60

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	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 3: Rapid, Inclusive and Sustained Economic Growth	To support the industry, the DOST in 2013 funded research program entitled “Enhancement of Milkfish Broodstock Management for Production of Good Quality Fry” 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 Industry 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	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	31-Mar-21	NEW	4,921,051.20	2,403,025.60
	Species composition and seasonality of eels in the river systems of Northeastern, Luzon (Old Title: Species Biodiversity of Philippine Eel (Anguilla sp.): A Precursor for Management and Prospect for Sustainable Aquaculture)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will be undertaken to provide benchmark data for the status of eel biodiversity in the country. Data that will be gathered in this project will be a strong instrument in the formulation or recommendation of policies for management and conservation for sustainable utilization of this fishery resource.	1. Maps on species abundance, plankton abundance, hydrological and physicochemical water quality of the different sites for eel gathering. 2. Catch data and CPUE of different gear for eel gathering 3. Protocol on eel conditioning and transport 4. Policy recommendation on eel gathering and conservation	CagSU	coastal and estuarine communities, eel gatherers, policymakers	1-Apr-18	31-Mar-20	ONGOING	4,996,676.00	903,259.50
	Sustainable Nile Tilapia Culture with Challenges Posed by Climate Change (Old Title: Sustainable Nile Tilapia Culture in the Cordillera Amidst Climate Change)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	In order to deal with the limitations of the region, conduct of R&D activities is significant and needed to improve fish production. It is the purpose of this project to identify the strains that will yield the highest volume and profit under the Cordillera condition. Management practices associated with fish production, including the role of women shall be documented.	1. Product - best performing strain of tilapia under upland, cool climate conditions 2. Publication “ (a) produced at least one publishable article on the evaluation of the performance of 4 strains of Nile tilapia in varying conditions in CAR, (b) at least one paper presentation to scientific conferences, (c) at least one IEC on production practices implemented, particularly on most appropriate strain evaluated 3. People and Services - trained at least 20 fisherfolk on improved strain fish production 4. Partnership - forged at least one linkage/ partnership 5. Places - established 3 experimental locations	BSU, IFSU, MPSPC	Target beneficiaries are the fisherfolk, especially those who are registered in the Municipal Fisherfolk Registration System of the Bureau of Fisheries and Aquatic Resources. This study will help increase aquaculture productivity and generate greater income for small-scale fisherfolks, improving their living standards. It will also help increase the availability of Nile tilapia for the general public.	1-Apr-18	30-Sep-19	ONGOING	4,143,339.00	542,684.74
	The eel fishery in tributaries along Lagonoy Gulf: Implications for conservation and management (Old Title: Eel Fry Fishery along Lagonoy Gulf)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project is a pioneering work to explore and understand the eel fishery in the Gulf, specifically on the knowledge on the geographic and seasonal distribution of the species. The project will address the lack of baseline data as basis for management of eel fry resources in LG.	1. Eel fishing grounds 2. Eel resource map 3. Species identification, 4. Information on peak and lean season 5. Catch and volume by lunar phase 6. Gear inventory and catch data by gear, CPUE 7. Post harvest handling practices 8. Supply and value chain report	BU	Eel fry gatherers, traders, LGUs, BFAR, scientific community and conservation agency	1-Apr-18	31-Dec-19	ONGOING	4,464,314.00	626,979.11
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 3: Rapid, Inclusive and Sustained Economic Growth	1. Develop a panel of qRT PCR primers that may be used to rapidly screen potential natural sources of immunostimulant and growth promoting feed additives for the mangrove crab Scylla serrata 2. Characterize 3 novel sources of immunostimulants and growth promoters. 3. Determine the coupled effect of immunostimulants on disease resistance and growth rate in Scylla serrata. 4. Optimize formulation of a functional feed from at least one natural immunostimulant and growth promoting additive source.	A rapid cost-effective means to screen potential sources of feed additives with immunostimulant properties for mangrove crabs -A panel of primers/enzymes for multiplexed rapid screening -Information on the coupled effect of disease resistance and growth rate improvement presenting pathways where interventions may be possible - Identified and characterized 3 novel sources of immunostimulants	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	NEW	16,326,494.80	6,390,037.00

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status 'As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
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 3: Rapid, Inclusive and Sustained Economic Growth	The project aims to generate information that will improve our current understanding of molecular mechanisms underlying host response of S. serrata to WSSV infection	1. Information on dynamics of WWSV 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	NEW	15,101,598.00	5,535,777.00
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 3: Rapid, Inclusive and Sustained Economic Growth	1. Validate local and indigenous practices in juvenile species and molting stage identification using automated and molecular methods; 2. Develop a network of mangrove crab stakeholders knowledgeable in the latest molecular biology and information technology for improvement of mangrove crab farm; and to 3. Create a nationwide network that generates live updated temperature vulnerability maps of mangrove sites in the Philippines	1. A compendium of local and indigenous practices in juvenile species and molt stage identification, grow-out and capture practices of mangrove crabs, validated using automated methods and DNA barcoding; 2. Database and network of mangrove crab stakeholder in the country; 3. An online CrabMAP that is updated regularly through data-mining algorithms and a nationwide network of contributors that will provide temperature readings of mangrove sites and fish ponds in the Philippines	DLSU	Regulatory Bodies, LGUs, Research Institutions, Academe, and the General Public	1-Aug-19	31-Jul-22	NEW	4,606,476.00	1,575,492.00
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 Characterization of Bioactive Protein and Lipid from Mussel)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Marine invertebrates have long been established to contain novel biologically active compounds with interesting pharmaceutical applications.	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	31-Dec-21	NEW	17,486,760.00	12,020,995.00
Mussel Biotechnology Program (Old Title: Biotechnological Utilization of Philippine Green Mussel Perna viridis (Mussel Biotech Program))	Project 2. Extraction and Utilization of Mussel Glycogen (Proj. 2 Utilization of HAB Affected Mussels for Biotechnology Applications)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project aims to extract and utilize glycogen from mussels for food and non-food applications	1. Efficient method for extracting and purifying glycogen from green, brown and charru/black mussels 2. Purified glycogen for molecular biology applications 3. Food grade glycogen	UPV	The results of the project will be beneficial to the general consumers; mussel farmers, researchers, and food supplement industry partners	1-Jan-19	31-Dec-20	NEW	10,999,779.00	8,718,799.00
R&D Program on Assessment and Implementation of Control and Management Strategies for Invasive Knifefish in Laguna de Bay	Project 1. Mark- Recapture Strategy to Estimate Population Size and Track Site Fidelity of Invasive Knifefish (Chitala ornata ) in Laguna de Bay	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The general objective of this project is to estimate population size and structure using mark and recapture surveys at six sites . The specific objectives are:  1) Determine/estimate knifefish population size and density using mark and recapture methods 2) Determine movement patterns of knifefish 3) Determine /estimate natural population traits from length and weight data 4) Assess most efficient gear for catching knifefish	• Map showing density of knifefish population at six selected sites. • Map showing movement range. • Policy recommendation on population control strategies based on population characteristics • Protocol or method on most efficient fishing gear to catch knifefish/optimal fishing techniques for reducing knifefish population	UPLB	• Direct target beneficiaries of the results from this study is the Interagency Technical Working Group on the Containment of Knifefish, the Local Government Units and FARMCs involved in the control of knifefish.,	1-Jun-18	31-May-20	ONGOING	2,547,446.00	1,270,083.49
R&D Program on Assessment and Implementation of Control and Management Strategies for Invasive Knifefish in Laguna de Bay	Project 2. Distribution, Habitat Characterization and Control Strategies for Juvenile Knifefish (Chitala ornata) in Laguna de Bay	KRA 3: Rapid, Inclusive and Sustained Economic Growth	To locate and characterize knifefish schooling sites and develop and assess the efficiency of fish netting of juvenile knifefish in Laguna de Bay. 1. Determine and characterize schooling sites of knifefish juveniles in Laguna de Bay; 2. Determine the length of residence of juvenile knifefish in each schooling areas within a spawning season; 3. Assess the efficiency and selectivity of fish netting in schooling sites as control measure for knifefish juveniles	• Map with plotted GPS coordinates of confirmed schooling sites. • Detailed biological and physico-chemical profile of confirmed schooling sites. • Information on site fidelity and transitioning of juvenile knifefish from schooling lifestyle to solitary. • Optimized fishing gear specific to knifefish juveniles.	UPLB	• Policy makers and environmental managers from both national and global conservation agencies (e.g. Task force on knifefish, BMB, etc.) would benefit from the information (juvenile distribution and control strategies) derived from this study.	1-Jun-18	31-May-20	ONGOING	2,437,365.00	1,172,551.36
	Detection of Estrus (DOE) Project: Development of a Wearable Goat Peak Estrus Sensor	KRA 3: Rapid, Inclusive and Sustained Economic Growth	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-20	NEW	7,957,974.80	3,987,737.40

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	Development of Real-time Ultrasound Scanning and DNA Marker Selection Protocols for Meat, Carcass and Fertility Traits of Philippine Native Pig	KRA 3: Rapid, Inclusive and Sustained Economic Growth	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.	<ul style="list-style-type: none"> <li>Established genetic testing protocol using DNA marker technology for selected traits for use in breeding program.</li> <li>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.</li> <li>Established a genetic evaluation model that combines estimated breeding values and genomic information for selection/ranking of individual breeding animals.</li> <li>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</li> </ul>	PCC	<ul style="list-style-type: none"> <li>Swine industry (in general)</li> <li>Native pig breeder farms</li> <li>Academe and researchers</li> </ul>	1-Apr-19	31-Mar-22	NEW	12,734,782.00	1,857,777.25
	Establishment of Zampen Native Chicken Breeding Population with Improved Egg Production and Growth Performance	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project envisions to establish a ZamPen native chicken breeding population with improved egg production and growth performance	25,000 quality Zampen hardened chicks; 5,000 breeder ZamPen native chicken; improved reproductive and growth performance of ZamPen native chicken; ZamPen native chicken breeding and hatchery management technology; Native chicken breeding and production module and IEC materials; Technical personnel and farmer entrepreneurs capacitated on organized breeding and selection and production; established Zampen breeding units	JHCSC, WMSU	Native chicken raisers; native chicken domestic and institutional consumers; researchers/students	1-Apr-18	31-Mar-20	ONGOING	4,972,440.00	889,753.60
	Pilot Testing of Protein-Enriched Copra Meal (PECM): A Valuable Protein Feed for Swine and Poultry (Phase II)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	<p>The bioconversion of agricultural by-products such as sugarcane, baggasse, corn cobs and others, and nutrient supplemented by microbial strains into protein had been developed at BIOTECH using the solid-state fermentation technology. Results from the previous PCAARRD-funded project implemented last June 2012 to May 2015 showed that PECM has high potential as valuable protein feed ingredient. The technology could enhance the crude protein content of raw copra meal up to 36% (in dry weight basis) using <i>Aspergillus niger</i> 3104 through solid state fermentation process.</p> <p>Although the current status of the technology which is at laboratory scale level is really promising, its commercialization aspect should be backed up with data that are tested at pilot or commercial scale level. Hence, to realize the full potential of the PECM technology, it is imperative to establish bioprocess systems for the mass production of PECM to which the production cost should be minimized and the economies of the scale should be realized taking into consideration the technical realities and fermentation dynamics that will occur in the scaling up of the technology. Hence, this pilot testing of PECM production technology is being proposed to jumpstart the mass production and commercialization of the technology for the benefit of the local animal and feed milling industry.</p>	<p>Year 1 i; Established optimum level for pilot scale production of PECM i; Established upstream and downstream processes of the pilot scale production of PECM</p> <p>Year 2 i; Product quality data and performance of PECM in swine and poultry i; Intellectual Property (IP) protection for the technology and product i; Promotion of PECM technology and commercialization initiatives i; Generated business models for producing PECM i; Developed sustainability strategies for the equipment purchased and facility enhancements made</p> <p>Publication: At least 3 published papers</p> <p>Patent: 1 patent for pilot scale production of PECM 1 patent for PECM microbial inoculant</p> <p>Product: At least 24 tons of PECM produced (after optimization) At least 500 kg PECM powder inoculant</p> <p>People and Services: Organized 2 trainings and 2 seminars for the technology 1 PECM Pilot Plant Facility</p> <p>Places and Partnership: 1 Established quality control and testing laboratory At least 4 MOAs for feeding trial experiments At least 1 Technology transfer agreement</p>	UPLB	<ul style="list-style-type: none"> <li>Swine and Poultry Farmers</li> <li>Feed Millers and Processors</li> <li>Copra producers</li> </ul>	1-Nov-17	30-Apr-20	ONGOING	24,355,676.00	1,025,837.60
Conservation, Improvement and Profitable Utilization of the Philippine Native Pigs	Project 1. Organized breeding and selection for the establishment of breeding true-to-type native pig populations in CAR, Cagayan Valley, Calabarzon and Mimaropa	KRA 3: Rapid, Inclusive and Sustained Economic Growth	<p>Native pigs are those, which originated and produced in a particular place or locality and not affected by modern selection and breeding. Production and reproductive performance of native pigs in general are inferior to the commercial stocks. But due to the minimal capital and operating costs needed to raise native pigs, smallholder farms tend to favor them. Hence, native pigs are commonly perceived to have important socio-economic roles in the traditional and subsistence farming systems (Bondoc, 1995).</p> <p>Consumer preference for native pig meat is largely attributed to its unique taste, flavor and texture. Lechon is the most popular and sought after product from native pigs. Being resistant to diseases, the native pig meat is also perceived as free from antibiotic and other synthetic chemical residues. The trend of shifting consumer preference toward naturally produced food products further highlights the potentials of native pig production as source of additional income to rural dwellers. Moreover, Philippine native pigs are very rich sources of genetic materials for local breed development and improvement programs. However, because of the very wide variations in productivity, production efficiency and duration of production cycles, products from native pigs are difficult to assess and much less to predict. This characteristic of the native pig is considered one of the major barriers to its production in commercial scale.</p> <p>An apparent change in the type of native pig consumers in the country is also observed. In addition to the traditional domestic or household consumers, institutional buyers i.e. restaurants, supermarkets, and healthy food processing companies have indicated demands for regular supply of native pig meat in recent years.</p> <p>Taking off from the gains of the native chicken R&amp;D this program will develop breeding true to type populations of Philippine native pigs with improved and predictable production performance and consistent product quality in 4 Regions</p>	<p>1. 7 Breeding true-to-type genetic groups (Marinduke, Bondoc Peninsula, Kanlinga, Benguet, Isabel, Nueva Vizcaya, Eastern Samar) of Philippine native pigs</p> <p>2. Breeder native pig populations (at least 20 sows and 4 boars) of 7 genetic groups</p> <p>3. Genetic diversity of 7 native pig groups</p> <p>4. Breeding and selection protocols for breed development of native pigs</p> <p>5. At least 13 scientific papers for publication</p> <p>6. Scientific papers for presentation</p>	MSC, KASC, NVSU, BAI, BSU, MPSPC, ISU, UPLB	<p>1. Researchers, professors, students and swine breeding practitioners</p> <p>2. Native pig farmers</p> <p>3. Native pig Consumers</p> <p>4. Institutional markets</p>	1-Jul-14	30-Jun-19	ONGOING	39,336,853.00	607,188.69

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status <sup>1</sup> As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
Conservation, Improvement and Profitable Utilization of the Philippine Native Pigs in Eastern Visayas	Project 1: Native Pig Breeding and Production as Sustainable Livelihood Option in Calamity Prone Areas	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will develop signature breeds of Philippine native pig in Eastern Visayas with high uniformity in physical appearance, predictable performance and producing consistent product quality.	1. Breeding true to type genetic group of native pigs in region 8. 2. At least 3 scientific papers on phenotypic/genetic characteristics and unique high value traits, correlation between genetic characteristics and desirable phenotypic traits, utility of molecular markers on growth, reproduction, resistance to disease, adaptation to environment and meat quality attributes. 3. Native pig populations (50 sows and 10 boars) with improved growth and reproductive performance and meat quality. 4. Breeding and selection technology on native pig breed development and production performance improvement "	ESSU	1. Researchers, professors, students and swine breeding practitioners 2. Native pig farmers 3. Native pig Consumers 4. Institutional markets	1-Jul-15	30-Jun-20	ONGOING	8,127,124.00	1,219,207.18
Feeds and Feeding Systems for the Improved Mallard Ducks	Project 3: Establishment of Feeding System for the Improved Philippine Mallard Duck Raised under Range Management System	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project is about establishing a feeding system for the improved Philippine Mallard Duck raised under range management system	1. Feeding program for the improved breed of Philippine mallard duck under range management system 2. Identified feed form that is most efficient to use at growing and laying stages under range management system 3. Identified stocking density for optimum performance of PMD at growing and laying stage raised under range management system 4. Identified effects of madre de agua supplementation on performance of PMD on range. 5. Identified levels of mixed feed supplementation for PMD on range. 6. Evaluation of different fauna and flora in the herd. 7. Publications	CLSU	duck raisers,entrepreneurs	1-Jul-17	31-Aug-19	ONGOING	3,141,265.00	437,492.00
Innovative Marketing and Distribution Strategies for Balut and New Products	Project 1. The Culture of Balut Production and Consumption (Old Title: Ethnography of Philippines' Balut Culture)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The efficiency of marketing strategies for Philippine ethnic delicacies is highly dependent on understanding the processes, rituals, and human intersections with relation to Balut as a cultural product.	1.History of Balut making and consumption in the country 2.Description of the organizational culture (formal and informal) within the Balut industry 3.Comprehensive information and analysis on balut as a cultural product based on consumerâ€™s perspective	UST	Duck egg industry players, producers and consumers	1-Aug-18	31-Jan-20	ONGOING	857,671.00	157,273.00
Innovative Marketing and Distribution Strategies for Balut and New Products	Project 2. Analysis of Nutraceutical Contents of Balut (Old Title: The Potential of Balut for Health and Human Nutrition)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Provide empirical evidence on the nutritional significance of balut. Chemical analysis of balut will be carried out in accordance to standard published methods	â€¢Quantification of energy, protein, fatty acids, moisture, ash, dietary fiber, beta carotene, iron, calcium, phosphorus, ascorbic acid, total reducing sugars, total carbohydrate, Vitamin D, Vitamin E, Vitamin K, Vitamin B6, Vitamin B12, pantothenic acid, biotin, folate, choline, cholesterol, saturated fats, monounsaturated and polyunsaturated fats, DHA, EPA, calcium, phosphorus, iron, thiamin, riboflavin, niacin, chloride, cobalt, sulphur, copper, manganese, selenium, zinc, and iodine  â€¢Percent contribution to recommended energy and nutrient intake  â€¢Comparative analysis of whole balut and its separate components â€¢ yolk, duck embryo and white	UST	local balut producers, Consumers and researchers	1-Aug-18	31-Jan-20	ONGOING	1,179,398.00	137,385.00
Innovative Marketing and Distribution Strategies for Balut and New Products	Project 3. Innovative Marketing and Distribution System of Ethnic Duck Egg Delicacies and New Products (Old Title: Innovative Marketing and Distribution System for Ethnic Duck Egg Delicacies and New Products and Prototype Development of Balut Vending Machine and Packaging Material for Duck Egg Product)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	A marketing plan and a distribution plan are relevant in providing effective strategies that promote industry growth and better resource allocation. It is imperative that this research develops a marketing and distribution plan for the balut industry, as this can create backward and forward linkages that foster local employment and increase economic activity.	â€¢Established historical context to the processes and agents that have allowed for the creation of balut as a cultural icon â€¢Established niche of balut in the street food sector that could be a basis for marketing plans of the product â€¢Established organizational context to the production and sale of balut â€¢Narrative report on the countryâ€™s balut culture â€¢Established consumer-based context on the patronage of balut â€¢Established information for exploring marketing strategies to increase demand for balut â€¢Established information to aide marketing studies on balut to avoid failure studies â€¢Established database of balut industryâ€™s supply and distribution rate in the country â€¢Established information to aide in rebranding of duck egg products	UST	Duck raisers, duck egg industry, and other related duck industry stakeholders	1-Aug-18	31-Jan-20	ONGOING	2,962,931.00	507,883.00
Innovative Systems in Advancing Technology-Based Goat Production	Project 1.1. Organized Breeding and Selection of Individuals with Similar Morphometric Characteristics	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Thru the years, the continuous breeding efforts of goat in Cagayan Valley have led to the development of a unique and functional three-breed goat with blood composition of 87.5%Boer, 6.25%Anglo-nubian, 6.25%Native. This breeding scheme gave a 20% increase in slaughter weight compared to parental stock (50%Anglo-nubian,50%Native)or an increase from an average of 20.8kg in 2010 to 25kg in 2015.  To continuously produce this functional slaughter goat breed in Region 2, an organized breeding and selection program has to be implemented in selected farms. At the end of three years, this initiative is expected to produce a pool of breeding true-to-type foundation stocks that will be used to propagate the Cagayan Valley signature goat in Region 2.	Established breeding program Uniform quality of stocks 1 Breed registration for CV signature goat 1 Liquid nitrogen gas plant 10 Multiplier farms for CV goat breed 2 New nucleus/ breeder farms for selected elite CV goats	ISU	Goat raisers;Livestock policy-making bodies	1-Apr-17	31-Mar-20	ONGOING	13,442,928.00	926,530.59



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Innovative Systems in Advancing Technology-Based Goat Production	Project 1.2. Application of Assisted Reproduction Protocols in Support of the Establishment of CV Signature Goat Populations	KRA 3: Rapid, Inclusive and Sustained Economic Growth	To propagate goats with uniform morphometric characteristics that could produce the breeding true-to-type CV signature goat, reproductive assisted techniques will be optimized. Artificial insemination will continuously be promoted following the workable delivery system. On the other hand, considering the number of full blood does imported through the years, the use of embryo transfer (ET) will be explored in selected areas to increase the contribution of superior females in the breeding program.	1 utility model (UM) for pregnancy detection kit 1 prototype goat pregnancy detection kit	ISU	Goat raisers FGASPAPI	1-Apr-17	31-Mar-20	ONGOING	6,306,420.00	906,374.10
Innovative Systems in Advancing Technology-Based Goat Production	Project 4. Roll-out of Technology-based Options in Region I, II, III, V, VII, VIII, XI, XII and CAR	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The different outputs including technologies, best practices, processes and enterprises developed from the other studies will be promoted among the stakeholders using the industry-accepted tech-transfer modality for goat, the Farmer Livestock School on Goat Enterprise Management (FLS-GEM). This will address the need for continuous promotion of technology-based options and is the function of Project 4.	1 copyright for FLS-GEM manuals Revised FLS-GEM manuals Vol 1&2 10 MOUs signed with various stakeholders for FLS implementation 6000 farmers trained on GEM 300 facilitators trained on FLS-GEM implementation	ISU	Goat raisers FGASPAPI LGUs and AEWs	1-Apr-17	31-Mar-20	ONGOING	16,377,296.00	7,324,056.20
Sustainable Production, Marketing and Utilization of Established and Improved Bolinao Chicken in Ilocos Region	Project 1. Genetic Improvement Program for Bolinao Chicken through Conventional and Molecular Approaches	KRA 3: Rapid, Inclusive and Sustained Economic Growth	To motivate and encourage small-scale farmers to venture in the production of native chicken and increase their income, there is a need to identify them phenotypically and molecularly and there should be a supporting production management strategy to attain productivity.	a. A compendium of the phenotypic characters of Bolinao chicken in Ilocos. b. Description of the population structure of Bolinao chicken in Ilocos. c. Baseline information of the existing indigenous practices.	MMSU	a. Policy makers b. Breeders c. Geneticist d. Researchers e. Livestock Farmers f. Students	1-Jan-18	31-Dec-20	ONGOING	5,571,619.00	1,486,254.46
Sustainable Production, Marketing and Utilization of Established and Improved Bolinao Chicken in Ilocos Region	Project 2. Sustainable Feeding and Management Systems for Bolinao Chicken	KRA 3: Rapid, Inclusive and Sustained Economic Growth	There is a need to improve the feeding and other production management systems to meet this growing demand and likewise the possibility of creating stable niche market of native chicken.	A. 1 Utility model for feed formulation and patent for feed ingredients B. Improved cultural management practices for Bolinao native chicken C. 2 Publications related to feeding and brooding and hatchery management for Bolinao native chicken	DMMSU	a. Policy makers b. Breeders c. Geneticist d. Researchers e. Livestock Farmers f. Students	1-Jan-18	31-Dec-20	ONGOING	5,514,810.00	1,616,701.95
Sustainable Production, Marketing and Utilization of Established and Improved Bolinao Chicken in Ilocos Region	Project 3. Market Analysis and Product Development of Bolinao Native Chicken	KRA 3: Rapid, Inclusive and Sustained Economic Growth	To make the most of its potential, it is necessary to upscale the production and develop various marketing strategies through market analysis and product development. This study will provide a benchmark information of the key players in the marketing flow as well as existing policies in native chicken production. This relevant data will therefore be the basis in formulating strategies to better showcase the product.	A. Evaluated the supply chain of native chicken in Region I B. Gathered primary and secondary data of key players. C. Developed interventions marketing strategies and value-adding techniques D. Developed various marketing strategies and value-adding techniques. E. Established marketing channels of native chickens.	MMSU	a. Policy makers b. Breeders c. Geneticist d. Researchers e. Livestock Farmers f. Students	1-Jan-18	31-Dec-20	ONGOING	4,494,420.00	1,221,029.41
Sustainable Production, Marketing and Utilization of Established and Improved Bolinao Chicken in Ilocos Region	Project 4. Technology Transfer and Partnership with the Private Sector towards Sustainable Production of Bolinao Chicken (Old Title: Establishment of Model Farms Implementing the Package of Technology for the Production of Bolinao Chicken	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The establishment of techno-demo farm for Bolinao chicken showcases the economic viability and further creation of profitable enterprises necessary to assess the potential radiance of the generated research outputs.	A. Characterized prospect private partners in terms of their resources and trainings needed. B. Conducted training to capacitate farmers on how to manage Bolinao chicken. C. Establish demo farm from Package of technology. D. Prepared training modules and conducted hands-on demonstration to farmers. E. Implemented the Package of technology and Monitored the dispersal of the Bolinao Native Chicken.	MMSU	a. Policy makers b. Breeders c. Geneticist d. Researchers e. Livestock Farmers f. Students	1-Jan-18	31-Dec-20	ONGOING	3,784,317.00	1,148,948.76
	Capacity Building for Reef Assessment and Coral Taxonomy (Old Title: Training on Reef Assessments and Coral Taxonomy (TRACT))	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The Indo-West Pacific has long been recognized as the center of diversity for scleractinian or stony corals and many other reef associated organisms (Veron 1995, Sanciangco et al. 2013). The top three countries in terms of stony coral diversity are currently Indonesia with 581 species (Veron 2002), Philippines with 545 species (Veron et al. 2009), and Papua New Guinea with 494 species (Fenner 2003). However, despite being in the center of coral diversity in the world, most Filipinos lack the basic knowledge and understanding about corals and coral reefs. This is unfortunate as Philippine corals are also the most threatened in the world (Burke et al. 2011) with an estimated one third of coral species at elevated risk of extinction (Carpenter et al. 2008). In addition, the reefs that corals build in the Philippines generate about US\$ 1.35 billion in economic activity every year, about US\$1 billion of this amount from coral reef fisheries alone (White et al. 2000).	Publications â€¢ 24 Participants Outputs â€¢ 1 Refined Survey Manual and Protocol Booklet for reef assessments â€¢ 1 Poster â€¢ 1 Red List of Philippine Corals  People and Services â€¢ 4 Trainings â€¢ At least 12 Trained Personnel/Training  Products â€¢ 2 Training Modules â€¢ 1 Updated Coenomap website â€¢ 9 Electronic Field Guides for 9 major families  Year 1  â€¢ Training module for the assessment training â€¢ Training module for the taxonomy training â€¢ Updated Coenomap website â€¢ Participant's outputs (e.g., Re-entry Plan)  Year 2  â€¢ Electronic field guides on nine (9) families: Faviidae, Mussidae, Pectinidae, Acroporidae, Pocilloporidae, Fungiidae, Euphyllidae, Oculinidae, Agariciidae	DLSU	Primarily those involved in assessments and monitoring of coral reefs most especially those in LGUs who have coral reef related work; Members of the PCAARRD Consortium; LGU; DENR; Malampaya Foundation (MFI)	1-Oct-17	30-Sep-19	ONGOING	4,999,555.00	1,448,842.30

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	Current Status and Resilience of Coral Reefs in Lagonoy Gulf, Eastern Bicol	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Coral reefs are strongly connected by currents and many coral reef organismsâ€™ recruits in one area may depend on the coral reefs of other areas. Therefore, when considering management and conservation of coral reefs, it is vital to understand the current status of coral reefs in both small and large scales. This information is critical for management and conservation planning for local coral reefs. This project determines the current status of the coral reefs and its resilience considering the key functional groups (herbivores, algae, and corals) as well as the socioeconomic influence that would regulate coral reef ecosystems which are critical inputs in the management and conservation of coral reefs in Lagonoy Gulf.	Products â€¢ IEC on coral reef resiliency â€¢ Maps and databases  Publication â€¢ 2-3 research paper in ISI or peer reviewed journal â€¢ Submission of Abstract and presentation in two (2) prestigious International Coral Symposium <ul style="list-style-type: none"> <li>o Asia Pacific Coral Reef Symposium on June 2018 at Cebu City, Philippines.</li> <li>o International Coral Reef Symposium on June 2020 at Bremen Germany</li> </ul> â€¢ At least 2-3 National conference presentation <ul style="list-style-type: none"> <li>o PAMS</li> <li>o NRS</li> <li>o FIMFS</li> </ul> Patents â€¢ At least 5 copyrights on Maps and IEC materials produced People Services â€¢ 4 University personnel trained on reef assessment methodologies, data processing and analyses especially in relation to reef resiliency. â€¢ 1 seminar-workshop organized (at least 50 participants) for LGUs and CRM practitioners on reef resilience and establishment of MPA.  Places and Partnerships â€¢ 10 MOA (between Bicol University and the 10 Municipalities covered in this study). â€¢ Partnership and collaboration with Partido State University (PaSU) in Camarines Sur, Catanduanes State University (CatSU) and Bicol University	BU	Regulatory Bodies such as BFAR and DENR, LGUâ€™s of 9 municipalities and 1 city and Researchers and Academicians of Partido State University (PaSU) in Camarines Sur; Catanduanes State University (CatSU) and Bicol University	1-Nov-17	31-Oct-20	ONGOING	4,989,572.00	641,633.60
	DNA Barcoding of Selected Marine Fishes in Davao and Sulu Archipelago (Old Title: DNA Barcoding of Selected Marine Fishes in Basilan, Sulu and Davao Provinces)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This study will initiate the DNA barcoding of fishes that are located in highly diverse reef areas of Davao and Sulu Archipelago (Sulu, Basilan and Tawi-Tawi).	Publicatins â€¢ 2 indexed publications  Products â€¢ DNA barcode information for more than 300 species of marine fish from Basilan, Sulu, Tawi-Tawi and Davao region â€¢ Database library on DNA barcodes of marine fishes from Basilan, Sulu, Tawi-Tawi and Davao â€¢ Functional web design on DNA barcoding information based from the collection sites â€¢ All the analyzed COI sequences submitted to GenBank, BOLD, and Cryobank  People Services â€¢ 10 faculty/staff from UP Mindanao, DNSC, DOSCST, USEP, Davao Doctorâ€™s College trained on DNA barcoding extraction protocol â€¢ 6 BS Biology students of UP Mindanao obtained undergraduate thesis assistance  Places and Partnerships â€¢ Prior Informed Consents (PICs) from 8 LGUs (Davao City, Gov. Generoso, Lamitan City, Isabela City, Jolo, Tongkil, Sibutu and Sitangkai), commodity clearance and gratuitous permit from DA-BFAR â€¢ 3 MOA signed with MSU-TCTO, DNSC and DOSCST for research collaborations and technical support	UPMin	Academe, government sectors, fisherfolks and resource managers for the protection/conservation of marine fishes in the Basilan, Sulu, Tawi-Tawi and Davao. Faculty/Staff of HEIs in Davao Region (DNSC, DOSCST, USEP, Davao Doctorâ€™s College) and in MSU-TCTO for the hands on training on DNA barcoding BS Biology students and faculty member of UP Mindanao	1-Jan-18	31-Dec-20	ONGOING	4,999,105.00	1,603,421.84
	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-Jul-21	NEW	8,033,440.00	2,643,068.00

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status <sup>1</sup> As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	Kuroshio Current Observing System in the Philippines: Remote observations of the interactions of the Kuroshio with Internal Tides and Mesoscale Currents in Luzon Strait by High Frequency Doppler Radio Scatterometer (HFDRS)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Our current understanding of the forcing mechanisms that determine the Kuroshio intrusion into the LS remains limited, whether from observational evidence, laboratory experiments, theoretical analyses, or numerical model simulations. The role of the Kuroshio in the momentum, heat and salt budgets of the WPS and of the Indonesian Through-Flow (ITF) is receiving increased attention; time series of maps of currents at high temporal and spatial resolution are needed to resolve the dynamics of the governing processes. This Kuroshio Current Observing System will yield an improved understanding of the oceanography of southern Luzon Strait (LS), and provide ocean currents measurements of Balintang and Babuyan channels. Processes that will be studied include the intrusion of Kuroshio Current, mainly through the Balintang Channel (e.g., Chern and Wang, 1998; Liang et al., 2003, 2008; Yuan et al., 2008a), mesoscale currents and in particular island wakes, topographically-generated internal tides and internal waves, their mutual interactions, and their modulation by low frequency fluctuations such as the El Niño/Southern Oscillation (ENSO) and the Pacific Decadal Oscillation (PDO). The surface currents data will also benefit biochemical oceanography studies, as well as ecology and fisheries. It will also provide environmental data for developing and conserving marine resources in southern Luzon Strait, in particular around the Batanes and Babuyan Group of Islands.	Products ₱ Database of surface currents and in-situ data ₱ Time-series oceanographic data  Publication ₱ 3 Scientific Journals  People Services ₱ 10 Trained Personnel ₱ 5 Graduate Students - 4 MS Marine Science students - 1 PhD student  Partnerships ₱ MOA with University of Hawaii and Woods Hole Oceanographic Institution  Policy ₱ S&T based information that will input into policy or guidelines for conservation and management of marine resources for Southern Luzon Strait	UPD	Philippine government agencies/ academe/ researchers who use surface current maps for maritime safety, search and rescue operations, weather forecasting, maritime enforcement, marine science, oceanographic research and fisheries.	16-Dec-17	15-Dec-20	ONGOING	35,609,106.00	5,800,966.39
	Optimization and Pilot Testing of the Developed Drying System for Seaweeds	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project is about the optimization and pilot testing of a developed village-level seaweed dryer (floating and permanent prototype) which will provide the optimum operating parameters of the developed drying system for a more efficient drying operations.	Product: Commercial prototype of the seaweed drying system Publication: 1 Operator's Manual; 2 Technical Brochure (floating and permanent type); 1 Published Technical Paper; and 3 Paper presentations People: 4 Trainings on Operations Repair and Maintenance (ORM) Places and Partnerships: Partnership with BFAR 4A and DOST 4B; & Licensing Agreement	UPLB	Small to Medium-Scale farmers and farmers' groups that lack of the technology to properly dry their seaweed harvest.	16-Jun-18	15-Jun-20	ONGOING	4,968,142.00	2,186,587.03
	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 Philippines 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 industry's contribution to the country'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 dried tuna	Products ₱ Vacuum fried tuna skin. ₱ Information on the acceptability and nutritive value of the newly developed product from tuna wastes.  Publications ₱ At least 1 paper for publication (acceptability of vacuum fried tuna products through consumer test/processing optimization of vacuum fried tuna products).  People Services ₱ 5 trained panelists on descriptive testing and product sensory evaluation.  Places and Partnerships ₱ Partnership with Southern Philippines Agri-Business and Marine and Aquatic School of Technology (SPAMAST) and Philippine Women College. ₱ Partnership with the Department of Science and Technology-Region 11  Patents ₱ utility model (Process of producing vacuum fried tuna skin)	DNSC	Tuna industry Local Fisherfolk Small, Medium and Micro Enterprises	1-Oct-19	30-Sep-22	NEW	5,000,000.00	190,266.00

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	Reproductive Development and Early Life Growth of <i>Sardinella gibbosa</i> in the Visayan Sea	KRA 3: Rapid, Inclusive and Sustained Economic Growth	To examine various aspects of the reproduction and early life stages of <i>S. gibbosa</i> in the Visayan Sea to provide strategic inputs to the management of their fisheries	Publication: presentations in 2 conferences; technical reports; 4 publications Patents: Critical habitats of early and other life stages of sadines 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 <i>S. gibbosa</i> ; 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-Oct-19	30-Sep-21	NEW	4,999,566.00	2,661,637.00
	Ridge to Reefs Modelling and Monitoring for Decision Support System	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project aims to develop a comprehensive coastal ecosystembased system (DCCES) that would provide sound scientific information on the true health of marine waters of Pujada and Mayo Bays upon which management interventions should be anchored for areas being targeted as protected areas.	Product: 1 potential technology on Comprehensive Coastal Ecosystem-based System (CCES) with scientific basis and will be packaged for environmental monitoring 2 Ecological Map People services: 2 Public symposia Publications: 1 Operator's Manual 1 Technical Brochure 2 Published Technical Paper 2 Paper presentations (local and international conferences) 1 Report (written in layman's language for DOST and LGU) Partnerships: 2 Partnership (MOU/MOA) with PO & LGU 1 Research service agreement with University of Tokyo Policy: Policy recommendation as inputs in the crafting of city or <del>Barangay ordinance</del>	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-21	NEW	2,943,844.00	1,073,000.00
	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):	PNRI	Regulatory Bodies, LGUs, Research Institutions, Academe, and the General Public	1-Feb-18	31-Jan-21	ONGOING	7,623,639.00	2,427,186.91

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status <sup>1</sup> As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	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 <ul style="list-style-type: none"> <li>ISI Publication</li> <li>Primer on substrate stabilization and management</li> </ul> Products <ul style="list-style-type: none"> <li>Recovery Potential Model</li> <li>Habitat Map</li> <li>Quarterly Monitoring Reports</li> <li>Protocols for substrate stabilization</li> </ul> People and Services <ul style="list-style-type: none"> <li>Personnel trained in substrate stabilization</li> <li>Participants/students/on the job trainees</li> <li>Master of Science graduates</li> </ul> Places and Partnerships <ul style="list-style-type: none"> <li>DENR IV-B</li> <li>Improved linkage between Sablayan LGU, DENR IV-B, DOST, and UPLB</li> </ul> Policies <ul style="list-style-type: none"> <li>Input to proposed policy instruments</li> <li>Protocol for substrate stabilization</li> </ul>	UPLB	LGU, DENR, DOT, academe, researchers and students	16-Oct-19	15-Oct-21	NEW	5,000,000.00	2,828,428.00
Assessing the Status of Giant Clams and Advancing Culture Techniques	Project 1. Evaluating the status of giant clams in Luzon and Visayas	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Over 30 years ago, populations of giant clams ( <i>Tridacna gigas</i> ) in the Philippines were overexploited and virtually locally extinct. Since 1987, hatchery-produced giant clams have been restocked by the University of the Philippines Marine Science Institute (UPD MSI) with local collaborators in over 40 sites around the country. This program is the longest-running giant clam restocking initiative in the world. After almost three decades, anecdotal reports indicate that some of the giant clams that were restocked in early 2000 are already providing recruits to adjacent reefs. However, the full impact of the program, particularly on the potential of restocked clams to replenish wild populations around Philippines, remains to be determined.	Publications <ul style="list-style-type: none"> <li>ISI Publication</li> <li>Biodiversity of giant clams in selected sites representing Philippine biogeographic regions differentially impacted by climate change induced thermal stress</li> <li>Impact of past giant clam restocking efforts especially on giant clam recruitment</li> <li>Zooxanthellae clades in <i>Tridacna gigas</i> and <i>T. crocea</i> identified and mapped against thermal regimes of selected biogeographic regions</li> </ul> Non-ISI Publications <ul style="list-style-type: none"> <li>Primer</li> <li>Giant clam restocking and impact of thermal stress on giant clams</li> </ul> Manual <ul style="list-style-type: none"> <li>Manual on monitoring of giant clam populations and identification of zooxanthellae clades</li> </ul> Video Production <ul style="list-style-type: none"> <li>Video production summarizing the output of the Program</li> <li>Press releases about project activities and outputs</li> </ul> Products (Knowledge) <ul style="list-style-type: none"> <li>Giant clam populations</li> <li>Biodiversity of giant clams as differentially impacted by climate change</li> </ul>	UPD	<ul style="list-style-type: none"> <li>Local communities including the local government units (LGUs) that will be involved in the monitoring and conservation efforts. The results of the proposed project will be disseminated through information, education and communication (IEC) materials to help promote giant clam restocking, monitoring and conservation efforts to relevant coastal communities and government agencies.</li> <li>Fishers and other direct users of goods from coral reef ecosystems: giant clams contribute to reef restoration and will in the long-term contribute to the delivery of valuable goods and ecosystem services.</li> <li>Research/scientific community: data obtained from these studies will provide further avenues for research related to understanding the biodiversity and growth of giant clams</li> <li>Students: the project will support graduate student research and serve as a platform for the training of students in giant clam culture techniques and transcriptome data generation and analysis</li> </ul>	1-Feb-18	31-Jan-21	ONGOING	19,161,341.00	5,064,892.60

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
Assessing the Status of Giant Clams and Advancing Culture Techniques	Project 2. Evaluating the status of giant clams in Palawan	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Over 30 years ago, populations of giant clams ( <i>Tridacna gigas</i> ) in the Philippines were overexploited and virtually locally extinct. Since 1987, hatchery-produced giant clams have been restocked by the University of the Philippines Marine Science Institute (UPD MSI) with local collaborators in over 40 sites around the country. This program is the longest-running giant clam restocking initiative in the world. After almost three decades, anecdotal reports indicate that some of the giant clams that were restocked in early 2000 are already providing recruits to adjacent reefs. However, the full impact of the program, particularly on the potential of restocked clams to replenish wild populations around Philippines, remains to be determined.	Publications ISI Publication â€¢ Biodiversity of giant clams in selected sites representing Philippine biogeographic regions differentially impacted by climate change induced thermal stress (in connection with Proj 1) Non-ISI Publications Primer â€¢ Giant clam restocking and impact of thermal stress on giant clams Manual â€¢ Manual on monitoring of giant clam populations and identification of zooxanthellae clades (in connection with Proj 1) Video Production â€¢ Video production summarizing the output of the Program â€¢ Press releases about project activities and outputs Products (Knowledge) â€¢ Giant clam populations i,§ Biodiversity of giant clams as differentially impacted by climate change induced thermal stress (in connection with Proj 1) People and Services â€¢ Graduate student research supported	WPU	â€¢ Local communities including the local government units (LGUs) that will be involved in the monitoring and conservation efforts. The results of the proposed project will be disseminated through information, education and communication (IEC) materials to help promote giant clam restocking, monitoring and conservation efforts to relevant coastal communities and government agencies. â€¢ Fishers and other direct users of goods from coral reef ecosystems: giant clams contribute to reef restoration and will in the long-term contribute to the delivery of valuable goods and ecosystem services. â€¢ Research/scientific community: data obtained from these studies will provide further avenues for research related to understanding the biodiversity and growth of giant clams â€¢ Students: the project will support graduate student research and serve as a platform for the training of students in giant clam culture techniques and transcriptome data generation and analysis	1-Feb-18	31-Jan-21	ONGOING	3,803,277.00	933,147.19
Assessing the Status of Giant Clams and Advancing Culture Techniques	Project 3. Evaluating the status of giant clams in Mindanao	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Over 30 years ago, populations of giant clams ( <i>Tridacna gigas</i> ) in the Philippines were overexploited and virtually locally extinct. Since 1987, hatchery-produced giant clams have been restocked by the University of the Philippines Marine Science Institute (UPD MSI) with local collaborators in over 40 sites around the country. This program is the longest-running giant clam restocking initiative in the world. After almost three decades, anecdotal reports indicate that some of the giant clams that were restocked in early 2000 are already providing recruits to adjacent reefs. However, the full impact of the program, particularly on the potential of restocked clams to replenish wild populations around Philippines, remains to be determined.	Publications ISI Publication â€¢ Biodiversity of giant clams in selected sites representing Philippine biogeographic regions differentially impacted by climate change induced thermal stress (in connection with Proj 1) Non-ISI Publications Primer â€¢ Giant clam restocking and impact of thermal stress on giant clams Manual â€¢ Manual on monitoring of giant clam populations and identification of zooxanthellae clades (in connection with Proj 1) Video Production â€¢ Video production summarizing the output of the Program â€¢ Press releases about project activities and outputs Products (Knowledge) â€¢ Giant clam populations i,§ Biodiversity of giant clams as differentially impacted by climate change induced thermal stress (in connection with Proj 1) People and Services â€¢ Graduate student research supported	DNSC	â€¢ Local communities including the local government units (LGUs) that will be involved in the monitoring and conservation efforts. The results of the proposed project will be disseminated through information, education and communication (IEC) materials to help promote giant clam restocking, monitoring and conservation efforts to relevant coastal communities and government agencies. â€¢ Fishers and other direct users of goods from coral reef ecosystems: giant clams contribute to reef restoration and will in the long-term contribute to the delivery of valuable goods and ecosystem services. â€¢ Research/scientific community: data obtained from these studies will provide further avenues for research related to understanding the biodiversity and growth of giant clams. â€¢ Students: the project will support graduate student research and serve as a platform for the training of students in giant clam culture techniques and transcriptome data generation and analysis.	1-Feb-18	31-Jan-21	ONGOING	6,653,102.00	1,628,322.60

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
Assessing the Status of Giant Clams and Advancing Culture Techniques	Project 4. Development of molecular resources for enhancement of culture and rearing techniques	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Giant clams are one of the most popular and iconic bivalve molluscs. They help draw attention to the state of coral reefs and the efforts to conserve them (Neo et al. 2015). Giant clams provide food and habitat to various marine organisms (Cabaitan et al. 2008), thus adding to reef biodiversity and aesthetics (Gomez & Mingoa-Lincuanan 2006). However, due to their reliance on symbiotic association with photosynthetic microalgae (zooxanthellae), filter-feeding ability, large size, and sessile nature, giant clams are especially vulnerable to drastic changes in water quality (e.g. increases in turbidity, nutrient quality, temperature and acidity). Giant clams are also intensively harvested for both food and marine aquarium trade market and are thus vulnerable to overfishing and poaching (Mies et al 2017). Some species of giant clams are considered endangered (Gomez & Mingoa-Lincuanan 2006). Through the efforts of the Marine Science Institute, giant clams have been restocked and propagated in Bolinao, as well as in other parts of the Philippines. The giant clam ocean nursery maintained by the Bolinao Laboratory represents the largest and most diverse collection of this species.	Publications ISI Publication â€¢ Comparison of the first reference transcriptomes of 2 giant clam species â€¢ Developmental transcriptome for identification of genes relevant to giant clam growth, development, biomineralization, symbiosis and stress response Video Production â€¢ Video production summarizing the output of the Program Products (Knowledge) â€¢ Optimized protocols for total RNA extraction â€¢ Giant clam genetics â€¢ Genetic responses to stress Database â€¢ Sequence database for 2 giant clam species People and Services â€¢ Graduate student research supported i. § De novo reference transcriptome assembly and comparative analysis i. § Developmental transcriptome analysis i. § 2 graduate students trained in giant clam culture and transcriptome analysis â€¢ Training	UPD	â€¢ Fishers and other direct users of goods from coral reef ecosystems: giant clams contribute to reef restoration and will in the long-term contribute to the delivery of valuable goods and ecosystem services. â€¢ Research/scientific community: data obtained from these studies will provide further avenues for research related to understanding the biodiversity and growth of giant clams â€¢ Students: the project will support graduate student research and serve as a platform for the training of students in giant clam culture techniques and transcriptome data generation and analysis	1-Feb-18	31-Jan-21	ONGOING	16,971,166.00	5,737,200.81
Coastal Acidification: How it Affects the Marine Environment and Reosources in the Philippines	Project 1: Spatio-temporal trends in pH, CO2, and related parameters	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Ocean warming and ocean acidification will have profound effects on coral reef ecosystems and pose grave threats to corals and reef-associated fauna and flora. These disturbances affect key reef processes and impact different levels of reef organization (individual, population, ecosystem) while also interrogating the effects of environmental perturbations on the organismal processes of settlement, metamorphosis, growth, and survival. These are the critical events that maintain the ability of a reef to perform its provisioning and regulating services to mankind.  The skeleton of massive corals and sediment deposits can record environmental changes and the coral's response to these changes. Given the absence of monitoring data, retrospective analysis using coral skeletons can provide longterm information that can give insights on the response of corals to acidification and other environmental stressors. It will yield important baselines for assessing future changes in ocean chemistry and would fill a major data gap for the region.  The Philippine marine resources are already under a barrage of attacks from localized anthropogenic activities (e.g., pollution, sedimentation, direct destruction, overfishing). These cannot be ignored along with global stressors of increased sea surface temperatures and acidification. Now more than ever it is necessary to holistically monitor and study our marine ecosystems to understand how they are being impacted by these changes, and hopefully maintain their resilience, and prepare our people who are dependent on these systems for future changes. Results of the study will serve as relevant input towards strategies for climate change adaptation measures related to biodiversity conservation, food security, and livelihood of the poorest and most vulnerable sectors of the Philippines â€¢ the millions of fisher families and coastal communities that rely on the continued availability of reef resources.	Publications â€¢ 1 ISI publications â€¢ Primer on coastal/ocean acidification for the general public Products â€¢ Map of pH for Philippine waters â€¢ Map of aragonite saturation for Philippine waters People & Services â€¢ 3 Graduate student research supported Year 1 People and Services â€¢ Three student research supported Publication â€¢ Primer on coastal/ocean acidification for the general public Places and Partnerships â€¢ Establishment of sites in Bolinao and Mabini for spatio-temporal sampling People & Services â€¢ 3 Graduate student research supported (started in February 2018) Year 2	UPD	â€¢ Local and national government offices concerned with coral reefs and the communities that depend on them. â€¢ Resource planners, local state colleges and universities who can be trained to monitor changes in pH, carbonate and other relevant parameters.	1-Feb-18	31-Jan-21	ONGOING	18,251,855.00	4,197,220.90

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
Coastal Acidification: How it Affects the Marine Environment and Reosources in the Philippines	Project 2: Impacts of acidification on the base of the matine food web and their effects on marine production	KRA 3: Rapid, Inclusive and Sustained Economic Growth	<p>Ocean warming and ocean acidification will have profound effects on coral reef ecosystems and pose grave threats to corals and reef-associated fauna and flora. These disturbances affect key reef processes and impact different levels of reef organization (individual, population, ecosystem) while also interrogating the effects of environmental perturbations on the organismal processes of settlement, metamorphosis, growth, and survival. These are the critical events that maintain the ability of a reef to perform its provisioning and regulating services to mankind.</p> <p>The skeleton of massive corals and sediment deposits can record environmental changes and the coral's response to these changes. Given the absence of monitoring data, retrospective analysis using coral skeletons can provide longterm information that can give insights on the response of corals to acidification and other environmental stressors. It will yield important baselines for assessing future changes in ocean chemistry and would fill a major data gap for the region.</p> <p>The Philippine marine resources are already under a barrage of attacks from localized anthropogenic activities (e.g., pollution, sedimentation, direct destruction, overfishing). These cannot be ignored along with global stressors of increased sea surface temperatures and acidification. Now more than ever it is necessary to holistically monitor and study our marine ecosystems to understand how they are being impacted by these changes, and hopefully maintain their resilience, and prepare our people who are dependent on these systems for future changes. Results of the study will serve as relevant input towards strategies for climate change adaptation measures related to biodiversity conservation, food security, and livelihood of the poorest and most vulnerable sectors of the Philippines â€” the millions of fisher families and coastal communities that rely on the continued availability of reef resources.</p>	<p>Publications</p> <ul style="list-style-type: none"> <li>â€¢ 1 ISI publications</li> </ul> <p>People &amp; Services</p> <ul style="list-style-type: none"> <li>â€¢ Formal Training</li> <li>â€¢ 3 Graduate student research supported</li> <li>â€¢ Informal Training</li> <li>â€¢ 1 Students trained in molecular tools for looking at plankton</li> <li>â€¢ 3 Students trained in the fields of ocean acidification and plankton research, and mesocosm experiments</li> </ul> <p>Year 1</p> <p>People &amp; Services</p> <ul style="list-style-type: none"> <li>â€¢ Three graduate students trained</li> </ul> <p>Places and Partnerships</p> <ul style="list-style-type: none"> <li>â€¢ 3 Prior Informed Consents</li> </ul> <p>Year 2</p> <p>Products</p> <ul style="list-style-type: none"> <li>â€¢ Database on plankton assemblages (densities, assemblage and genomics) along environmental gradients and through the mesocosm</li> </ul> <p>People and Services</p> <ul style="list-style-type: none"> <li>â€¢ Train at least 2 students on genomics and ocean acidification field and</li> </ul>	UPD	Fisheries managers, resource planners, local and global scientists	1-Feb-18	31-Jan-21	ONGOING	23,559,779.00	5,098,165.85
Coastal Acidification: How it Affects the Marine Environment and Reosources in the Philippines	Project 3: Possible influence of acidification on specific reef resources	KRA 3: Rapid, Inclusive and Sustained Economic Growth	<p>Ocean warming and ocean acidification will have profound effects on coral reef ecosystems and pose grave threats to corals and reef-associated fauna and flora. These disturbances affect key reef processes and impact different levels of reef organization (individual, population, ecosystem) while also interrogating the effects of environmental perturbations on the organismal processes of settlement, metamorphosis, growth, and survival. These are the critical events that maintain the ability of a reef to perform its provisioning and regulating services to mankind.</p> <p>The skeleton of massive corals and sediment deposits can record environmental changes and the coral's response to these changes. Given the absence of monitoring data, retrospective analysis using coral skeletons can provide longterm information that can give insights on the response of corals to acidification and other environmental stressors. It will yield important baselines for assessing future changes in ocean chemistry and would fill a major data gap for the region.</p> <p>The Philippine marine resources are already under a barrage of attacks from localized anthropogenic activities (e.g., pollution, sedimentation, direct destruction, overfishing). These cannot be ignored along with global stressors of increased sea surface temperatures and acidification. Now more than ever it is necessary to holistically monitor and study our marine ecosystems to understand how they are being impacted by these changes, and hopefully maintain their resilience, and prepare our people who are dependent on these systems for future changes. Results of the study will serve as relevant input towards strategies for climate change adaptation measures related to biodiversity conservation, food security, and livelihood of the poorest and most vulnerable sectors of the Philippines â€” the millions of fisher families and coastal communities that rely on the continued availability of reef resources.</p>	<p>Publications</p> <ul style="list-style-type: none"> <li>â€¢ 1 ISI publications</li> </ul> <p>Products(knowledge)</p> <ul style="list-style-type: none"> <li>â€¢ Knowledge/information on reef community shifts under changing environmental conditions</li> <li>â€¢ Knowledge/information on link between eutrophication (e.g. from mariculture) and acidification</li> <li>â€¢ Knowledge/information on reef community shifts under changing environmental conditions.</li> <li>â€¢ Knowledge/information on primary producers and plankton biomass and community shifts under changing environmental conditions.</li> <li>â€¢ Knowledge/information on gene markers that are linked to stress response of sponges</li> <li>â€¢ Faster methods for quantification of plankton through pigment analysis and genomics</li> </ul> <p>People &amp; Services</p> <ul style="list-style-type: none"> <li>â€¢ Formal Training</li> <li>â€¢ 4 Graduate student research supported</li> <li>â€¢ Informal Training</li> <li>â€¢ DENR, BFAR, LGU personnel in the study sites trained in monitoring coral cover and diversity, algal and sponge community composition, giant clam handling, pH and other parameters</li> </ul> <p>Year 1</p>	UPD	Conservation biologists, Fisheries resource managers, Environmentalists, Ecologists, Ecotoxicologists	1-Feb-18	31-Jan-21	ONGOING	24,816,356.00	7,317,337.74



Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
Coastal Acidification: How it Affects the Marine Environment and Reosources in the Philippines	Project 4: Acidification impacts on the demography of corals (ACID Corals)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	<p>Ocean warming and ocean acidification will have profound effects on coral reef ecosystems and pose grave threats to corals and reef-associated fauna and flora. These disturbances affect key reef processes and impact different levels of reef organization (individual, population, ecosystem) while also interrogating the effects of environmental perturbations on the organismal processes of settlement, metamorphosis, growth, and survival. These are the critical events that maintain the ability of a reef to perform its provisioning and regulating services to mankind.</p> <p>The skeleton of massive corals and sediment deposits can record environmental changes and the coral's response to these changes. Given the absence of monitoring data, retrospective analysis using coral skeletons can provide longterm information that can give insights on the response of corals to acidification and other environmental stressors. It will yield important baselines for assessing future changes in ocean chemistry and would fill a major data gap for the region.</p> <p>The Philippine marine resources are already under a barrage of attacks from localized anthropogenic activities (e.g., pollution, sedimentation, direct destruction, overfishing). These cannot be ignored along with global stressors of increased sea surface temperatures and acidification. Now more than ever it is necessary to holistically monitor and study our marine ecosystems to understand how they are being impacted by these changes, and hopefully maintain their resilience, and prepare our people who are dependent on these systems for future changes. Results of the study will serve as relevant input towards strategies for climate change adaptation measures related to biodiversity conservation, food security, and livelihood of the poorest and most vulnerable sectors of the Philippines â€” the millions of fisher families and coastal communities that rely on the continued availability of reef resources.</p>	<p>Publications â€¢ 1 ISI publication</p> <p>Products â€¢ 1 simulation model with several scenarios</p> <p>People &amp; Services â€¢ Formal Training i, § 3 graduate research supported i, § 2 BS, possibly two MS, one PhD degree graduates in the sciences</p> <p>Places &amp; Partnerships â€¢ Partnership agreement with LGUs, DENR, BFAR, other stakeholders in the study sites i, § DENR, BFAR, LGU personnel in project sites trained in monitoring coral cover and diversity, algal and sponge community composition, giant clam handling, pH and other parameters</p> <p>Year 1</p> <p>Products â€¢ Maps of selected Batangas sites â€¢ Validation of the statistical power of the proposed layout and analysis of the changes in abundance, size-structure â€¢ Implementation and testing of the projection matrix model</p> <p>People and Services</p>	DLSU	Local and national government offices concerned with coral reefs and the communities that depend on them.	1-Feb-18	31-Jan-21	ONGOING	10,900,215.00	3,209,605.10
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	<p>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 plankton 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 Scopu / 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</p> <p>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 (VICAARP), 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</p>	UPD	National agency, LGUs, Coastal communities, coastal managers, researchers	1-Apr-18	31-Mar-21	ONGOING	8,676,484.00	2,234,548.73

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
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 in HAB cyst dynamics, hydrodynamic surveys, phytoplankton analysis, biological modeling, hydrodynamic modeling, HAB statistical analysis, remote sensing modeling, decision support-system development, consortium-building	UPD	LGUs, BFAR, general public, Network partners (Consortia) SUCs, mariculture industry	1-Apr-18	31-Mar-21	ONGOING	13,905,188.80	3,201,407.01
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	UPD	LGUs, BFAR, general public, Network partners (Consortia) SUCs, mariculture industry	1-Apr-18	31-Mar-21	ONGOING	12,696,856.00	3,188,395.77
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	To help answer the challenges of the variable and expansive HABs our country experiences by developing means for more rapid and increased scale of detection of algal blooms, and developing robust early-warning systems that would allow for more pro-active mitigation and enhanced understanding of HABs.	1 Manuscript in preparation for submission to SCI journal - Generalized HAB model for easier application to other sites - Comprehensive database on HABs collated - Predictive statistical model for Bolinao - 8 researchers trained or being trained in various aspects - 1 MSc student supported	UPD	LGUs, BFAR, general public, Network partners (Consortia) from SUCs, mariculture industry	1-Apr-18	31-Mar-21	ONGOING	24,702,489.20	6,479,863.83

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	Analysis of Business Models and Organizational Forms in Key Philippine Agricultural Industries: Implications on Innovation and Technology Development	KRA 3: Rapid, Inclusive and Sustained Economic Growth	In the Philippines, such diversity of business models is apparent in the different agriculture industries. For example, livestock industries are generally more vertically integrated compared to crops. Also, large multinational firms resort to contracting in crops (banana, pineapple), while in some industries vertical coordination manifests only within a certain point in the production and marketing processes. Several studies have documented such organizational models and arrangements including the use of contracts (see, for example, Digal, 2007; Carnaje, 2007; dela Cruz, 2007; Lanzona, 2007) and participation in supply chains (PCARRD, 2011). There remains, however, a dearth of rich information on the characterization of such forms and business models in key agriculture industries in the Philippines. There are further research questions as to how many of the farmers are covered by the different types of organizational arrangements and the explanations for such. It would be interesting to further investigate the prevalence of different organizational forms across agricultural industries (such as in crops and livestock), location (through provinces, regions, and island groups), and time. Furthermore, how these business models have evolved in response to certain constraining or facilitating factors would provide valuable lessons for the future development of the sector and public policy changes. It is in this light that this research is proposed. A targeted study would be useful in documenting the existing organizational arrangements in Philippine agriculture and their possible implication on innovativeness of firms. This is especially useful to technology developers who need to contend with the perennial issues of low technology adoption.	To analyze the prevalence of business models or organizational forms in key Philippine agriculture industries	UPLB	Decision-makers at PCAARRD, DOST Policy makers, Extension workers, Agricultural Businesses	1-Sep-19	30-Nov-20	NEW	5,000,000.00	5,000,000.00
	Cooperative-led Green Value Chain Development for Selected Commodities	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Economic growth is intricately intertwined with environmental and social dimensions of development. A kind of development that does not have a balance among the three dimensions is not sustainable and transformational. Environmental goals and targets are embedded in the SDGs as an affirmation that the problem exists and is urgent. At Rio+20, countries emphasized the inclusive green economy as one of the important tools available for achieving sustainable development. Conservation and sustainable use of ecosystem services and natural capital are the kinds of transformative changes that SDGs could and should catalyze (UNEP 2013). It is in this context that a green value chain development project through a cooperative approach is being proposed. "Greening" is defined as the processes by which suppliers, producers, processors, buyers and consumers reduce their negative social, economic and environmental impact by using less energy and water and decreasing waste and emissions, while also treating waste, promoting fair-trade and/or adopting appropriate quality and safety and other standards of corporate social responsibility (ESCWA and GIZ 2013) For the purpose of this research, the working definition of greening in a value chain will show any one of the following criteria: -Increase in recycling inputs -Maximization of processes such that material inputs are efficiently used; and/or -Reduction in the environmental impacts along the different stages of the chain Particular focus is given to cooperatives in the green value chain development, given their inherent nature as builders of sustainability and promoters of green development. Based on the above premises, the project's general objective is to develop green value chains for highland vegetables, milkfish, mango and banana, through cooperative-led greening activities. To this end, willingness, capability, and effective implementation of green practices, especially in the environmental	a. publications (e.g. journal articles, monograph) b. a model of a cooperative-led green value chain of selected agricultural products c. linkages developed between cooperative and local government units with applicable green technologies d. Policy agenda in "greening" a cooperative-led value chain of selected agricultural products	UPLB	Selected Agrifood producers and other stakeholders Decision-makers at PCAARRD, DOST Grantees of PCAARRD/DOST funding	1-Apr-18	31-Mar-20	ONGOING	5,000,000.00	2,262,265.99
	Development of Framework for Harmonizing Biosafety Guidelines and Research Protocols on Biosafety in the ASEAN Region(Old Title: Harmonizing Biosafety Guidelines and Research Protocols on Biosafety in the ASEAN Region)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The proposed project is envisioned to an umbrella project under the ASEAN Sub-Committee on Biotechnology, chaired by DOST. Given that harmonization of regulatory framework for product derived from modern biotechnology is a major component of the AEC blueprint, research teams of ASEAN countries should be encouraged to participate in the research project.	Harmonized framework and guidelines, research protocols on biosafety and standards for the ASEAN region	STRIVE	policy makers, research community	1-Feb-18	31-Aug-18	ONGOING	4,659,413.00	477,614.00

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	Enhancing the Various Policy Initiatives on Bamboo: Developing a Harmonized System for Community-based Inventory of Bamboo Resources in Key Production Areas in the Philippines	KRA 1: Transparent, Accountable and Participatory Governance	The gap in information pertaining to available bamboo resources can doom efforts in creating a more investment-friendly environment, if manufacturers continue to worry about where to source materials to feed their factories. Bamboo is very difficult to inventory given the diversity of bamboo species, nomenclature challenges across regions, the non-permanence of culms, and the sporadic presence of the plant in different types of landscapes. Hence, there is a need for a harmonized system that will take care of these differences in order to yield more accurate and complete information about the availability of bamboo in various parts of the country. The study will take advantage of the people's organization or local barangay units and the existing resource monitoring system such as the Community-Based Monitoring System (CBMS) when applicable to monitor the resource by developing a community-based inventory system. Ease of use and replicability of the inventory methodology will be aimed for so that the communities can be engaged in the process to ensure that the information is current, comparable and up-to-date.	1. Policies: Draft policy to support the institutionalization of community-based bamboo inventory system 2. People services: Trained community members on the inventory and identification of bamboo 3. Publication: Journal article, at least 1 policy brief 4. Product: Maps showing distribution of bamboo in 3 selected key production areas, field guide for proper identification of bamboo, harmonized community-based bamboo inventory system 5. Places and Partnership: LGUs, DENR, People's organizations, Local barangay units	UPLB	1. farmers and communities engaged in planting bamboo 2. potential investors in bamboo plantation development and bamboo-based enterprises 3. operators of manufacturing plants using bamboo as raw materials 4. local government units with bamboo resources	16-Feb-18	15-Feb-20	ONGOING	5,000,000.00	2,026,438.24
	Impact Assessment of the Program "Enhancing Research Utilization for Sweet Potato Livelihood Development on Disaster-Prone Communities in Tarlac and Albay	KRA 3: Rapid, Inclusive and Sustained Economic Growth	In 2009, the program on "Enhancing Research Utilization for Sweetpotato Livelihood Development in Disaster-Prone Communities" was implemented to enhance the role of sweetpotato as a key food and cash crop for livelihood rehabilitation in farming communities affected by natural disasters. The strategy was to use existing significant sweetpotato research outputs to enhance productivity and livelihoods. The program was implemented in Tarlac and Albay, both recognized as major sweetpotato-growing areas and characterized by high rates of disaster vulnerability and poverty. The program has three components: Project 1. Developing Capacities of Local Institutions for Addressing Sweetpotato Production and Marketing Constraints Faced by Resource-Poor Farmers in Tarlac and Albay (implemented by Visayas State University in collaboration with CIP-Philippines and UPLB) Project 2. Enhancing Livelihood Opportunities of Small Resource Poor Sweetpotato Farmers in Tarlac Province (implemented by Tarlac College of Agriculture in collaboration with DA-CLIARC and Tarlac Provincial Agriculture) Project 3. Improving Food Security and Livelihoods Among Households in Albay through Sweetpotato Production and Utilization (implemented by Albay Provincial Agricultural Services in collaboration with Bicol University and DA-Agricultural Experiment Station-Tabaco)	Publication i.; Documentation of the activities related to the conceptualization and implementation of the program; j.; Documentation of the inputs, outputs, and outcomes of the program; i.; Documentation of the impact pathway and level of adoption; i.; Data on adoption rate or growth rates in the number of adopters per year; i.; Measurement of the program's economic, social, and environmental impacts; i.; Estimates of return on R&D investment  Policies i.; Policy recommendations for the enhancement of the adoption of technology generated to further develop the sweetpotato industry	PSAU, BU	The beneficiaries of the program would include (a) policy and decision makers, national R&D/S&T system and the funding agencies supporting R&D activities; and (b) researchers who are directly involved in technology transfer/extension and economic evaluation.	1-Aug-19	31-Jul-20	NEW	2,781,262.00	1,428,691.40
	Policy Studies and Development to Promote the Resiliency of Philippine Watersheds	KRA 1: Transparent, Accountable and Participatory Governance	Over the years, most watersheds in the country have been degraded due to the inadequacy of related policies both in substance and in enforcement. Manifestations of these policy weaknesses are the absence of robust management plans in most watersheds, lack of coherence and synergy of plans and programs, unregulated land conversion, fragmentation and confusion of functions and mandates of various government agencies including LGUs, inadequate public and private investments in watershed development, and lack in knowledge and information for science-based management decisions.  This project will primarily investigate key policy issues and concerns in selected Learning Watersheds of INWARD related to the following key areas of concerns: 1) Institutionalization of payment for environmental services as a source of financing for key watershed projects in the upstream communities; 2) Promotion of watershed-based comprehensive land use and development planning; 3) Formation of multi-sectoral watershed councils; 4) Land use regulation and allocation	1. Policy on institutionalization of Payment of Environmental Services (PES) 2. Policy institutionalization of Formation of Multi Sectoral Management Council 3. Guidelines for Promotion and Development of watershed-based comprehensive land use, allocation, development planning and regulation 4. Watershed Policy Forum 5. Two (2) scientific journal publications	UPLB	DENR, LGUs, stakeholders	1-Jun-17	31-Aug-19	ONGOING	4,844,232.00	(10,896.79)

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	Valuing Bio-Resources and Ecosystems Services for Access Benefit Sharing and Payment for the Ecosystem Services: The Case of Bataan National Park (Old Title: Valuing Forest Bio-Resources and Ecosystem Services for Access Benefit Sharing and Payment for Ecosystem Services: The Case of Bataan Natural Park)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Economic valuation of the bio-resources and ecosystem services addresses the concern on assigning value to biodiversity that is the prerequisite to an efficient approach to resource allocation (OECD, 2002). This aids decision-makers in striking a balance between biodiversity conservation and pursuing economic growth and development as well as optimal resource allocation. Hence, this study intends to value bio-resources and ecosystem services in support to policy options for access and benefit sharing and payment for forest ecosystem services mechanisms.	1. People: Capacity building on valuing non-market resources (analytical methods and framework suitable to the Philippine context); Inclusion of value, preference, and attitude as well as status of access and benefit sharing of off-site and on-site communities in the decision-making 2. Partnership: Involvement of the local community, LGUs, and NGAs in valuing and management of protected areas 3. Policies: Analysis of policy options on PES and access benefit sharing, ABS mechanisms, PES mechanisms 4. Publication: Minimum of one journal publication	UPLB	The target beneficiaries of the knowledge products expected from this project are the environmental and socio-economic researchers, policy makers, decision-makers involved in the biodiversity conservation, ecosystem-based management, payment for ecosystem services development, and private-public partnerships on forest management and biodiversity conservation. Local communities are also expected to benefit from the study in the long-run through PES implementation and appropriate resource access and benefit sharing schemes	1-Jan-18	30-Jun-20	ONGOING	5,000,000.00	2,369,382.69
Changing Patterns in Social, Demographic and Economic Conditions of Farmers in Selected Agricultural Production Systems; Implications for Agricultural Policies and Innovation	Project 1. Changing patterns in social, demographic and economic conditions of farmers in rice production: Implications for Agricultural Policies and Innovation	KRA 1: Transparent, Accountable and Participatory Governance	It is often said albeit anecdotal, that an increasing number of farm families do not encourage their children to pursue agriculture as a profession/vocation. Determination of and understanding the prevailing aspirations, values and beliefs of the farming communities may shed light on this issue. Thus, an analysis of the characteristics of the farmers will lead to the determination of the interface between farmers/fisherfolks and the structural conditions that will contribute to the development of the agricultural sector.	Publication 18journals/policy brief book Places and Partnership Key government agencies (NEDA, DBM, DA, DOST, DENR), LGUs, POs, RBOs Policy Policy forum for advocacy initiatives Policy recommendations in relation to agricultural innovations and policies  Product Database on social, economic and demographic characteristics of farmer s People Improvement in welfare of Filipino farmers and other rural stakeholders	UPLB	Researchers and extension workers Research managers and funding and monitoring agencies Policy and decision makers Government institutions and research agencies Local government units Farmers and other rural stakeholders Universities offering agriculture, forestry and fishery courses	1-Nov-17	31-Oct-19	ONGOING	5,752,154.00	340,509.79
Changing Patterns in Social, Demographic and Economic Conditions of Farmers in Selected Agricultural Production Systems; Implications for Agricultural Policies and Innovation	Project 2. Changing Patterns in Social, Demographic and Economic Conditions of Farmers in Corn and Vegetable Production: Implications for Agricultural Policies and Innovation	KRA 1: Transparent, Accountable and Participatory Governance	It is often said albeit anecdotal, that an increasing number of farm families do not encourage their children to pursue agriculture as a profession/vocation. Determination of and understanding the prevailing aspirations, values and beliefs of the farming communities may shed light on this issue. Thus, an analysis of the characteristics of the farmers will lead to the determination of the interface between farmers/fisherfolks and the structural conditions that will contribute to the development of the agricultural sector.	Publication 18journals/policy brief book Places and Partnership Key government agencies (NEDA, DBM, DA, DOST, DENR), LGUs, POs, RBOs Policy Policy forum for advocacy initiatives Policy recommendations in relation to agricultural innovations and policies  Product Database on social, economic and demographic characteristics of farmer s People Improvement in welfare of Filipino farmers and other rural stakeholders	UPLB	Researchers and extension workers Research managers and funding and monitoring agencies Policy and decision makers Government institutions and research agencies Local government units Farmers and other rural stakeholders Universities offering agriculture, forestry and fishery courses	1-Nov-17	31-Oct-19	ONGOING	4,096,154.00	396,054.50
Changing Patterns in Social, Demographic and Economic Conditions of Farmers in Selected Agricultural Production Systems; Implications for Agricultural Policies and Innovation	Project 3. Changing Patterns in Social, Demographic and Economic Conditions of Farmers in Plantation Crops Production: Implications for Agricultural Policies and Innovation	KRA 1: Transparent, Accountable and Participatory Governance	It is often said albeit anecdotal, that an increasing number of farm families do not encourage their children to pursue agriculture as a profession/vocation. Determination of and understanding the prevailing aspirations, values and beliefs of the farming communities may shed light on this issue. Thus, an analysis of the characteristics of the farmers will lead to the determination of the interface between farmers/fisherfolks and the structural conditions that will contribute to the development of the agricultural sector.	Publication 18journals/policy brief book Places and Partnership Key government agencies (NEDA, DBM, DA, DOST, DENR), LGUs, POs, RBOs Policy Policy forum for advocacy initiatives Policy recommendations in relation to agricultural innovations and policies  Product Database on social, economic and demographic characteristics of farmer s People Improvement in welfare of Filipino farmers and other rural stakeholders	UPLB	Researchers and extension workers Research managers and funding and monitoring agencies Policy and decision makers Government institutions and research agencies Local government units Farmers and other rural stakeholders Universities offering agriculture, forestry and fishery courses	1-Nov-17	31-Oct-19	ONGOING	6,195,886.00	527,024.83

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status 'As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
Changing Patterns in Social, Demographic and Economic Conditions of Farmers in Selected Agricultural Production Systems; Implications for Agricultural Policies and Innovation	Project 4. Changing patterns in social, demographic and economic conditions of farmers/fishers in aquaculture production: Implications for Agricultural Policies and Innovation	KRA 1: Transparent, Accountable and Participatory Governance	It is often said albeit anecdotal, that an increasing number of farm families do not encourage their children to pursue agriculture as a profession/vocation. Determination of and understanding the prevailing aspirations, values and beliefs of the farming communities may shed light on this issue. Thus, an analysis of the characteristics of the farmers will lead to the determination of the interface between farmers/fisherfolks and the structural conditions that will contribute to the development of the agricultural sector.	Publication 18journals/policy brief book Places and Partnership Key government agencies (NEDA, DBM, DA, DOST, DENR), LGUs, POs, RBOs Policy Policy forum for advocacy initiatives Policy recommendations in relation to agricultural innovations and policies  Product Database on social, economic and demographic characteristics of farmer s People Improvement in welfare of Filipino farmers and other rural stakeholders	UPV	Researchers and extension workers Research managers and funding and monitoring agencies Policy and decision makers Government institutions and research agencies Local government units Farmers and other rural stakeholders Universities offering agriculture, forestry and fishery courses	1-Nov-17	31-Oct-19	ONGOING	4,859,653.00	450,665.00
Changing Patterns in Social, Demographic and Economic Conditions of Farmers in Selected Agricultural Production Systems; Implications for Agricultural Policies and Innovation	Project 5. Changing Patterns in Social, Demographic and Economic Conditions of Farmers in Livestock and Forestry: Implications for Agricultural Policies and Innovation	KRA 1: Transparent, Accountable and Participatory Governance	It is often said albeit anecdotal, that an increasing number of farm families do not encourage their children to pursue agriculture as a profession/vocation. Determination of and understanding the prevailing aspirations, values and beliefs of the farming communities may shed light on this issue. Thus, an analysis of the characteristics of the farmers will lead to the determination of the interface between farmers/fisherfolks and the structural conditions that will contribute to the development of the agricultural sector.	Publication 18journals/policy brief book Places and Partnership Key government agencies (NEDA, DBM, DA, DOST, DENR), LGUs, POs, RBOs Policy Policy forum for advocacy initiatives Policy recommendations in relation to agricultural innovations and policies  Product Database on social, economic and demographic characteristics of farmer s People Improvement in welfare of Filipino farmers and other rural stakeholders	UPLB	Researchers and extension workers Research managers and funding and monitoring agencies Policy and decision makers Government institutions and research agencies Local government units Farmers and other rural stakeholders Universities offering agriculture, forestry and fishery courses	1-Nov-17	31-Oct-19	ONGOING	4,096,153.00	321,482.33
Development of Appropriate Innovation Approaches in the Context of Selected Small Island Municipalities in Southern Luzon	Project 1. Development of Appropriate Innovation Approaches in the Context of Selected Small Island Municipalities in CALABARZON Region	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This research activity intends to identify technology-based AANR livelihood opportunities and appropriate technology delivery systems within the context of small island economy.  Specifically, it aims to: 1. Characterize the existing livelihood systems of selected small island municipalities of Jomalig (Quezon) and Tingloy (Batangas) 2. Assess the context of livelihood systems vulnerability in the selected island municipalities; 3. Analyze the socio-economic and political structures and processes affecting the small islands' livelihood systems; 4. Locate the role of S&T innovations in huoseholds' strategies for pursuing livelihood goals; and, 5. Develop and S&T innovation system approach appropriate to the livelihood context of small island communities in Southern Tagalog Region	Two market viability analysis reports (information on market viability) for S&T innovation based priority livelihood niche in the island-sites - one conference paper - one publishable journal article or working paper - one policy recommendation/paper identifying S&T interventions in Region 4A appropriate for sustainable development of small island municipalities - partnership with DOST Regional Office in 4A	UPLB	Beneficiaries of the project will include policy-makers, administrators and researchers of R&D agencies, development organizations, and ultimately, citizens in each small island municipality	1-Jan-19	31-Dec-20	NEW	2,529,879.00	1,332,291.00
Development of Appropriate Innovation Approaches in the Context of Selected Small Island Municipalities in Southern Luzon	Project 2. Development of Appropriate Innovation Approaches in the Context of Small Island Municipalities in the MIMAROPA Region	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This research activity intends to identify technology-bases AANR livelihood opportunities and appropriate technology delivery systems within the context of small island economy.  Specifically, it aims to: 1. Characterize the existing livelihood systems of selected small island municipalities of Corcuera (Romblon) and Linapacan (Palawan) 2. Assess the context of livelihood systems vulnerability in the selected island municipalities; 3. Analyze the socio-economic and political structures and processes affecting the small islands' livelihood systems; 4. Locate the role of S&T innovations in households' strategies for pursuing livelihood goals; and, 5. Develop and S&T innovation system approach appropriate to the livelihood context of small island communities in the MIMAROPA Region	- two market viability analysis reports (information on market viability) for S&T innovation based priority livelihood niche in the island-sites - one conference paper - one publishable journal article or working paper - one policy recommendation/paper identifying S&T interventions in Region 4B appropriate for sustainable development of small island municipalities - partnership with DOST Regional Office in 4B	UPLB	Beneficiaries of the project will include policy-makers, administrators and researchers of R&D agencies, develop organizations, and ultimately, citizens in each small island municipality.	1-Jan-19	31-Dec-20	NEW	2,470,121.00	1,298,095.00

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status 'As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
Development of Mixed Method Approaches to Impact Assessment of Philippine Research Projects	Project 1. Development of Mixed Method Approaches to Impact Assessment of Selected Research Projects in Southern Philippines	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Recognizing that research for development projects are becoming increasingly complex, multi- or trans-disciplinary and occur in dynamic settings, a need for more holistic and multidimensional approaches in assessing the projectsâ€™ livelihood, economic, social and environmental impacts is evident. Hence, the mixed method approaches to impact assessment are deemed more appropriate to understand the impact pathways and appraise the resulting impacts and capacity development among the research partners and communities in which projects are implemented.	Product: Mixed-method approach to impact assessment Publication: Mixed-method approach, workshop reports, terminal report Partnership: ACIAR and CSIRO; partnership with regional impact assessment stakeholders People Services: researchers trained on the mixed-method approach	UPLB	The beneficiaries of the project will include researchers pursuing impact assessment activities, Landcare stakeholders, and agencies and policymakers concerned with innovations in research and technology transfer	1-Mar-18	29-Feb-20	ONGOING	5,865,872.00	3,597,681.00
Development of Mixed Method Approaches to Impact Assessment of Philippine Research Projects	Project 2. Development of Mixed Method Approaches to Impact Assessment of Selected Research Projects in Central Philippines	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Recognizing that research for development projects are becoming increasingly complex, multi- or trans-disciplinary and occur in dynamic settings, a need for more holistic and multidimensional approaches in assessing the projectsâ€™ livelihood, economic, social and environmental impacts is evident. Hence, the mixed method approaches to impact assessment are deemed more appropriate to understand the impact pathways and appraise the resulting impacts and capacity development among the research partners and communities in which projects are implemented.	1. Products, mixed method approaches to impact assessment; 2. Publications, including guidelines for the mixed method approaches to impact assessment, 2 journal articles, workshop reports, and terminal report; 3. People and services, in terms of researchers trained on mixed method approaches; and 4. Places and partnerships, including partnership with ACIAR and CSIRO; partnership with regional impact assessment stakeholders; Landcare implementers (LGUs and Landcare Foundation)	VSU	policy-makers, administrators of R&D agencies, researchers pursuing impact assessment activities, and stakeholders of each of the selected research programs.	1-Mar-18	29-Feb-20	ONGOING	3,134,128.00	947,386.90
Value Chain Development and Piloting of Conventional Production and Marketing of Eggplant and Cabbage that meet Food Safety Standards Through Adoption of Internal Control System (ICS)(Old Title: Value chain development and piloting of conventional vegetable production and marketing that meet food safety standards through adoption of internal control system (ICS) (Assessment of the Viability of Conventional Vegetable Production and Marketing through Internal Control System (ICS) for Food Safety Standards))	Development of internal control system (ICS) for conventional vegetable production that meet food safety standards (Old Title: Pesticide Management and Monitoring of Residues as a basis for an Internal Control System for Conventional Production of Selected Vegetables to Address Food Safety)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will partner with the farmer, pest and pesticide management experts, post harvest experts, pesticide residue chemists, socio-economic experts and other stakeholders to come up with an ICS plan for specific crops for a profitable and safe vegetable production in Nagcarlan and Majayjay.	Publication 1)Article about pesticide residues 2)Article about safe pesticide management 3)ICS protocol Places and Partnerships 1)Partnership with the LGUs, barangay officials  People 1)Farmers trained on pesticide management and use of tools for pesticide residue assessment 2)Increased consumer awareness on safe vegetables  Policy 1)Adoption of ICS in the formulation of local policy for safe vegetable production 2)Development of municipal ordinance for the promotion of safe vegetable production and sustainability program to ensure long-term adoption  Product 1)Pesticide Management Plan for selected vegetables 2)Internal Control System (ICS) for conventional vegetable production	UPLB	Farmers, consumers, and other stakeholders	1-Oct-17	30-Sep-19	ONGOING	2,563,620.80	270,091.20
Value Chain Development and Piloting of Conventional Production and Marketing of Eggplant and Cabbage that meet Food Safety Standards Through Adoption of Internal Control System (ICS)(Old Title: Value chain development and piloting of conventional vegetable production and marketing that meet food safety standards through adoption of internal control system (ICS) (Assessment of the Viability of Conventional Vegetable Production and Marketing through Internal Control System (ICS) for Food Safety Standards))	Establishment of a sustainable and viable value chain for conventionally-produced safe vegetables (Old Title:Project 2. Profitability assessment of adopting an internal control system (ICS) in the production and marketing of fresh and safe vegetables)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	In line with Organic Agriculture Act 10068 efforts led by DA to pursue the production of organic vegetables are currently being pushed. The government must take a closer look at the current production practice in the context of food safety. With this, it is then imperative to establish an ICS for food safety in fresh vegetable produce through conventional production and assess its viability.	Product/Process 1)Alternative models for production and marketing of conventionally-produced safe vegetables; 2)Traceability system for conventionally-produced safe vegetables; 3)Packaging materials sample with printed brand and labels;  Places and partnerships 1)Farm clusters 2)Institutional market (e.g., supermarkets, hospitals, etc.)  Publication 1)Report on the complete documentation of the processes involved in the project. 2)Articles	UPLB	Vegetable farmers, farmer organizations, potential entrepreneurs, vegetable consumers, policy and decision makers, technology adoptors, potential investors and regulatory organizations and industry associations.	1-Oct-17	30-Sep-19	ONGOING	2,463,379.20	334,076.16

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	Assessment of Stakeholders' compliance to the Philippine Technology Transfer Act of 2009 (RA10055) (Old Title: Technology Transfer Performance Assessment of Government Research and Development Institutions (RDIs) and Higher Education Institutions (HEIs))	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project will assess the degree of compliance to RA10055 of various stakeholders in the agricultural innovation system (AIS). The project will identify potential gaps in the process, outlining areas for improvement, and identifying implementation obstacles, constraints and success factors	Publication One (1) refereed journal on technology commercialization Patent Copyright of published articles People Project output will benefit RA10055 Stakeholders (SUCs/RDIs, Government Agencies, Private sector) for a more efficient and effective technology commercialization Policy Policy recommendations may be useful to the RA10055 Stakeholders (SUCs/RDIs, Government Agencies, Private sector) concerning technology commercialization for agriculture, aquatic and natural resource management.	UPLB	SUCs/RDIs, intellectual property managers, technology transfer officers, policy makers, potential technology adoptors	1-Aug-19	31-Jan-21	NEW	3,495,582.00	2,203,706.00
	Assessment of the Performance, Reach and Outcomes of the Technology Transfer Modalities in Agriculture, Aquatic and Natural Resources(Old Title: Analysis of Extension and Technology Transfer Modalities in Agriculture, Fisheries, and Natural Resources in the Philippines (Analysis of Extension and Technology Transfer Modalities in Agriculture, Fisheries, and Natural Resources in the Philippines from the PAEPI's Biennial Conference Proceedings))	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project aims to assess the performance, reach and outcomes of the technology transfer modalities in the AANR sectors to determine the best implementation approaches, investments and gains of the technology transfer modalities' delivery system	Publication One (1) refereed journal on technology transfer modalities Patent Copyright of published article Products Knowledge Product - Compilation of innovative technology transfer modalities and best implementation approaches, investments and gains of the technology transfer modalities' delivery system People Project output will benefit technology transfer officers, community development workers, policy makers, farmers and other stakeholders Policy Policy recommendations may be useful to the: (1) funding agency and national government agencies concerning extension and technology transfer modalities for agriculture, aquatic and natural resource management; and (2) local government units and their affiliated agencies and other non-government sectors;	UPLB	Technology transfer officers, community development workers, policy makers, potential technology adoptors	1-Aug-19	31-Jan-21	NEW	4,867,280.00	3,177,673.00
	Biological Interventions In Coconut Scale Insect (CSI) Calamity Areas In Basilan, ARMM - Phase II	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project titled "Biological Interventions in the Coconut Scale Insect (CSI) Calamity Areas in Basilan, ARMM - Phase II" is proposed to address the urgent need to continuously control the devastations brought about by the Coconut Scale Insect (CSI) infestation in Basilan Island,. It intends to continue benefitting the municipalities where Phase 1 Project had not served. There are yet other 6 municipalities with a total of 106 barangays, with a total of 2,497,517 coconut trees and with a total of 8,420 coconut farmers in Basilan Province that need information and technology about the biological interventions. Other beneficiaries of the project include the coconut industry players, exporters, academe, researchers/SUCs, allied industries, households in both urban and rural areas	1. 1,000 coconut farmers and 12 LGU personnel trained 2. 10 trainings conducted 3. 2 Banker laboratory set ups @ 2 for Parasitoids and 2 for Predators  4. 2 SUCs, 2 Line Agencies & 6 LGUs  5. 6 Municipal resolutions on the application of CSI Biological Control Protocols and Quarantine  7. 400,000 Parasitoids harvested per year (minimum of 10 harvests per year @ 40,000 parasitoids per harvest)  8. 300,000 Predators harvested per year (minimum of 10 harvests per year @ 30,000 predators per harvest)  9. 4,000 copies of IEC materials produced & disseminated (2 Titles @ 2,000 copies per title)  10. 2 copyrights	MSU-Maguindanao	Coconut Farmers	1-Sep-19	31-Aug-20	NEW	4,879,640.00	2,995,000.00



Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	DOST-PCAARRD-CLSU Agriculture and Food Technology Business Incubator Phase 2	KRA 3: Rapid, Inclusive and Sustained Economic Growth	<p>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 country's economic development.</p> <p>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.</p>	<p>The expected outputs of the project are the following:</p> <p>A. Publications</p> <ol style="list-style-type: none"> <li>1 TBI business plan revised as needed;</li> <li>1 TBI operations manual revised as needed;</li> <li>At least 1 acceleration program curriculum/syllabus developed;</li> <li>At least 4 training modules developed;</li> <li>At least 3 IEC materials developed/revised and disseminated;</li> <li>1 operations manual on TBI web-based management information system developed;</li> <li>3 semi-annual reports prepared and submitted;</li> <li>3 annual reports prepared and submitted;</li> <li>1 terminal report prepared and submitted;</li> </ol> <p>B. Products</p> <ol style="list-style-type: none"> <li>At least 10 technologies commercialized/adopted for incubation/acceleration;</li> <li>1 TBI web-based management information system developed;</li> </ol> <p>C. People and Services</p> <ol style="list-style-type: none"> <li>At least 15 incubatees enrolled to the incubation program and launched as startup/spinoff;</li> <li>At least 10 accelerates enrolled to the acceleration program;</li> <li>At least 25 business plans of the incubatees/acceleratees</li> </ol>	CLSU	<p>The beneficiaries of this project are the following:</p> <ul style="list-style-type: none"> <li>AFNR students and graduates</li> <li>Micro, small, and medium enterprises (MSMEs)</li> <li>Established companies</li> <li>Start-up and spin-off companies</li> <li>Farmer-entrepreneurs</li> <li>CLSU faculty and staff</li> <li>Business organizations and cooperatives</li> <li>Local government units (LGUs)</li> </ul>	1-Dec-19	30-Nov-22	NEW	14,162,396.80	172,922.80
	Enhancing and Operationalizing Intellectual Property (IP) Management and Business Development Office in Consortia Member Agencies (Old Title: Enhancing the Capabilities of the Technology Transfer (TTO) in the Consortia and Selected Member Agencies)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	One of the strategies of the DPITC is to provide support in establishing and strengthening of TTOs in RDIs to effectively carry out their IP management and commercialization functions.	<ol style="list-style-type: none"> <li>9 ITSO strengthened to become TTOs in RDIs in Luzon</li> <li>9 TTOs established</li> <li>At least 20 technology transfer staff trained on IP management and commercialization</li> <li>5 IP protection applications filed per TTO per year</li> <li>Inventory matured technologies</li> <li>2 networking events and product matching</li> <li>1 technology per RDI commercialized</li> <li>TTO offices institutionalized</li> </ol>	CvSU	technology transfer offices and officers	1-Oct-17	30-Sep-19	ONGOING	24,224,457.60	4,199,723.79
	Enhancing GAP Compliance & Climate Resilience of Spray-Type Chrysanthemum Production in La Trinidad, Benguet (Old Title: Enhancing Science-based Community Agri-tourism (SciCAT) on Spray-type Chrysanthemum Production in La Trinidad, Benguet)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	<p>General:</p> <p>To boost the science-based community agri-tourism in La Trinidad, Benguet through S&amp;T interventions and GAP options in spray-type chrysanthemum production.</p> <p>Specific:</p> <ol style="list-style-type: none"> <li>1) To establish S&amp;T community-based farms on spray-type chrysanthemum production that will serve as an agri-tourism sites for chrysanthemum in La Trinidad, Benguet;</li> <li>2) To capacitate forty-six (46) farmers who will be part of the chain of STCBF farms as partners in enhancing science-based agritourism; and</li> <li>3) To show case the S&amp;T community-based farm sites to enable small scale spray-type chrysanthemum growers active participation and empowerment in the agri-tourism opportunity.</li> </ol>	<ul style="list-style-type: none"> <li>Increase production of Class AA (80 cm length) quality spraytype chrysanthemum cutflower by 50% (at least 2 dozen per square meter)</li> <li>Farmer partners income Increased by 80%</li> <li>Conducted four (4) trainings</li> <li>85 farmers trained including non-partner farmers growing Chrysanthemum</li> <li>Capacitated 46 famer partners on spray-type chrysanthemum community-based farm eco-tourism</li> <li>Conducted 1 farm harvest festival</li> <li>Conducted 4 technology field day (TF) at 1 TF per cluster/barangay</li> <li>Forged MOA between PCAARRD and BSU</li> <li>Forged MOA between key players</li> <li>IEC on farm tourism</li> </ul>	BSU	46 cutflower growers who are members of the La Trinidad Ornamental Growers Association (LATCOGA).	16-Sep-19	15-Sep-20	NEW	4,000,000.00	2,500,000.00
	Enhancing PCAARRD's Intellectual Property Management through Prior Art Search and Patent Landscape Assessment	KRA 3: Rapid, Inclusive and Sustained Economic Growth	IPOPHL's patent analysis and landscaping efforts and its provision of expertise in patent search are a means to assist innovative enterprises, R&D institutions as well as PCAARRD. The patent analytics and landscape portion of the project will be performed on the identified priority commodities of PCAARRD. The Patent Landscape Reports are envisioned to serve as a reliable reference in crafting priority R&D programs and evaluating future proposals to be funded by PCAARRD. The prior art search and assessment portion of the project will focus on the technology generating ongoing R&D projects of PCAARRD. The search reports will help determine early IP management strategies needed for the technologies in the pipeline.	<p>Year 1: 6 PLRs generated and 75 technologies assessed using prior art analysis</p> <p>Year 2: 6 PLRs generated and 75 technologies assessed using prior art analysis</p>	IPO	PCAARRD and RDIs	1-Feb-17	31-Jan-19	ONGOING	4,977,210.00	306,412.70

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	Establishment of Forage Production Modules for Slaughter Goat in Bongabon, Nueva Ecija: A S&T Community Based Farm Approach	KRA 3: Rapid, Inclusive and Sustained Economic Growth	<p>The community-based S&amp;T Farms for Forage Production will be in partnership of the Small Ruminant Center (SRC) of the Central Luzon State University (CLSU) and the Local Government Unit (LGU) of Bongabon and Lupao, Nueva Ecija with technical backstopping of PCAARRD-TTPD.</p> <p>The project activities will be divided into the following major components:</p> <p>1. Capability building and organization of farmer-clusters</p> <p>The proposed community-based forage S&amp;T farms will involve 40 goat raisers from Bongabon and Lupao Nueva Ecija. Before the implementation of the project, the farmers will first undergo capability building. During the activity the importance of the project, their commitment and cooperation will be emphasized. The farmers will be organized. Meeting(s) to organize them will be conducted. The principles of organization, responsibilities of leaders and members, among others will be discussed during the meeting(s). The organization will be done by the LGU of Bongabon and Lupao, and the local leaders of the barangay. The formation of farmers' association will be the first step to empower them.</p> <p>Capability building of those who will be involved will be done to prepare them in implementing the project. Training on the recommended technologies for forage and goat production will be conducted. There will be two types of trainings to be participated by those who will be involved in the project. First, the LGU technician(s) who will be in-charge of the LGU-based farms and who will monitor the community-based farms will attend the Training of Trainers (TOT) of the Farmers Livestock School on Goat Enterprise Management (FLS-GEM) which will be conducted by CLSU-SRC under Mr. Neal A. del Rosario, component leader of PCAARRD-CLSU Project. After the TOT, the technicians will spearhead the conduct</p>	<p>Established 4 farm clusters composed of 30 goat farmers;</p> <p>Trained at least 30 goat farmers;</p> <p>Conducted at least 9 trainings (Technologies on the establishment and maintenance of forage/seeding production modules; Technologies on improved goat management/enterprise);</p> <p>Established nursery with a total production of 300,000 seedlings;</p> <p>Established 4 community-based a total of 8 ha forage farm;</p> <p>Produced 108.4 tons/ha of fresh forages;</p> <p>Produced IEC materials;</p> <p>Documentation and performance monitoring of the project.</p>	CLSU	30 goat farmers	1-Mar-16	28-Feb-19	ONGOING	3,488,475.00	353,958.40
	Phase 2: Management and Commercialization of Technologies Generated from PCAARRD-funded Research Projects in UPLB	KRA 3: Rapid, Inclusive and Sustained Economic Growth	<p>The proposed Phase 2 project is a two-year undertaking which aims to continue and enhance/expand the efforts of the 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&amp;D projects implemented from 2016 to 2021.</p> <p>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.</p>	<p>The following are the target deliverables of the proposed project in its two-year duration:</p> <p>Stage 1. Capacity Building and Provision of Technical Assistance</p> <p>• Capacity building activities through IP management and technology commercialization trainings for:</p> <ul style="list-style-type: none"> <li>o 8 Internal activities conducted for UPLB researchers and staff</li> <li>o 10 Consultations and technical assistance provided to external agencies/individuals/partners</li> </ul> <p>Stage 2. Policy Development</p> <p>• Packaging and formalization of internal policies developed in Phase 1 for dissemination to the university constituents and stakeholders</p> <ul style="list-style-type: none"> <li>o 1 Compendium of policies</li> </ul> <p>• IEC materials on policies developed, printed and disseminated</p> <ul style="list-style-type: none"> <li>o 1 Compendium of policies printed and copies disseminated</li> </ul>	UPLB	1. University Researchers, Students and Staff 2. Industry Partners and Collaborators 3. Agriculture Sector, Aquatic, and Natural Resources (AANR) Sector	1-Mar-19	28-Feb-21	NEW	4,995,180.00	2,497,590.00

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	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.	<p>Publication: i, 2 IEC materials developed, translated and distributed i, 1 AVP produced</p> <p>Patent: 2 publications with copyright</p> <p>Products: 5 aquashade technologies installed in tilapia hatcheries that will serve as a model in Luzon</p> <p>People and Services: i, 5 seminars/trainings conducted on aquashade technology and latest technologies on tilapia seed production and hatchery management i, 5 tilapia hatchery operators identified as model for aquashade technology i, At least 50 tilapia hatchery operators trained</p> <p>Places and Partnership: i, 4 MOAs/MOUs signed (1 per SUC) i, 5 MOAs signed with hatchery operators i, Established linkages with the following: i 5 Hatchery operators i SUCs i At least 5 LGUs</p> <p>Policies: 1 guideline developed in using the aquashade technology for tilapia seed production</p>	CLSU	Tilapia hatchery operators in Luzon (Bataan, Nueva Ecija, Tarlac, Isabela, Region 4, Region 5)	1-Jul-19	30-Jun-21	NEW	4,932,944.00	2,603,872.00
	S&T Action Frontline for Emergencies on Flood Prone Areas using Bamboo in the Province of Maguindanao, ARMM	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project aims to demonstrate how to reduce soil erosion along the Rio Grande de Mindanao in the province of Maguindanao by planting bamboo along the riverbanks through the SAFE initiatives.	<p>Year 1:</p> <p>Products: 30,000 bamboo seedlings produced in the central nursery and sub-nurseries</p> <p>Publications: 3 New IEC materials published and distributed to different beneficiaries (for barangay officials, for the peoples organizations and another one for the high school students) about essentials of bamboo for riverbank rehabilitation, soil erosion and flood control and manual on the propagation and growing of bamboo i, One video documentation on the status in terms of riverbank erosion and flooding and of Rio Grande De Mindanao i, Five training module written</p> <p>People and Services: 90 persons trained on bamboo appreciation for riverbank rehabilitation and nursery establishment, maintenance and utilization</p> <p>Places and Partnerships: 3 MOAs signed between the barangay and MSUMaguindanao on the establishment of sub-nurseries. i, Established linkage with major projects that utilize bamboo for riverbank rehabilitation</p> <p>Policy: Policy on riverbank stabilization through bamboo technology</p> <p>Year 2:</p> <p>Products: 30,000 bamboo seedlings produced</p> <p>Publications: 3 new IEC materials written and distributed for bamboo</p>	MSU-Maguindanao	<p>Farmers, fishermen and residents along the 78 km Rio Grande de Mindanao traversing within the political boundary of the Province of Maguindanao and the small scale bamboo entrepreneurs in the province.</p> <p>The rehabilitation of the riverbank through planting of bamboo on its riverbank will not only address the problem of soil erosion, but also will protect the nearby communities from intensive flooding. It will also bring back the biodiversity of the area hence, stabilizing the ecosystem.</p> <p>The bamboo stand will create economic opportunities for the long term through the livelihood training initiated by the project. And the raw materials provided by the plantation establishment.</p>	1-Apr-17	31-Mar-20	ONGOING	4,874,434.00	1,233,235.20

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
	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	<p>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).</p> <p>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 have 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.</p> <p>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 PCAARRDs bamboo ISP is to increase hectares of bamboo plantation to increase pole production in order to meet the</p>	<p>1. produced 30,000 bamboo propagules</p> <p>2. planted and grown 4,000 bamboo propagules</p> <p>3. rehabilitated 350 clumps of kawayang tinik, 350 clumps of bontong and 350 clumps of Giant bamboo</p> <p>4. produced business plan and sustainability plan</p> <p>5. produced Techno guides on kawayang tinik and bontong production</p> <p>6. identified 70 farmer cooperators</p> <p>7. trained 70 farmer cooperators per barangay</p> <p>8. conducted 1 farmer field day</p> <p>9. forged 3 MOA/MOUs</p> <p>10. developed at least 1 policu recommendation</p>	MSU-IIT	Bamboo farmers, engineered bamboo and GDH manufacturers and producers, bamboo entrepreneurs	1-Aug-19	31-Jul-22	NEW	4,990,000.00	1,206,022.40
	S&T Community-Based Farm for Oyster Mushroom Production as an Alternative Source of Livelihood in Disaster Vulnerable Areas in Region 1	KRA 5: Integrity of the Environment and Climate Change Mitigation and Adaption	<p>The project on STCBF on mushroom production technology is being eyed as one of the alternative sources of livelihood for the people in Region 1. This can serve as additional source of income for them when the weather condition becomes less favorable for agricultural production. The farmers will be taught technologies on oyster mushroom production, preparation of pure culture, grain spawn and fruiting bags and food processing.</p>	<p>Product: 5 technologies transferred; 9000 fruiting bags (3000 per province); 10,500 kg mushroom (3 x 3500 kgs)</p> <p>People and Services: 3 farm clusters (1 per province); 15 technicians trained (from PLGU and MLGU); 15 trainings (5 trainings per province); 225 trainees; 3 laboratories established (1 per province)</p> <p>Places and Partnerships: 4 MOA/MOU signed (1 per province: SUC-LGU-Cluster; and 1 MOA among SUCs);</p> <p>Publications: 3 IEC materials developed, translated and distributed (3 x 1000 = 3000 copies); 5 training modules;</p> <p>Patents: 3 publication with copyright</p> <p>Policies: 1 marketing policy/guidelines</p>	UNP	Farmers - Fishermen - Womenâ€™s Organizations	15-Apr-17	14-Oct-19	ONGOING	4,043,006.00	637,606.85
	S&T Community-based Farms (STCBF) for a Sustainable Cacao Production in Bukidnon	KRA 3: Rapid, Inclusive and Sustained Economic Growth	<p>Cacao (Theobroma cacao L.) is a tree crop that is highly suitable in different crop production systems (intercropping or multi-story farming, agroforestry, etc.). In 2008, cacao was given a priority and officially regarded as a High- Value Crop by the Department of Agriculture. In October 2013, the DENR has included cacao in the National Greening Program (NGP) Commodity Roadmap of 2013-2016. Moreover, PCAARRD has identified cacao as one of the priority crops under its Industry Strategic Science and Technology Plans (ISPs). Local farmers have increased their interest in the cultivation of cacao due to the huge demand in the local and international markets, and with persistently favorable prices.</p> <p>The project will be implemented at the province of Bukidnon, specifically, the municipalities of Lantapan, Maramag, Valencia City and Malaybalay City. Bukidnon has a total land area of 1,049,859 hectares. 669,529.25 hectares is classified as timberland and the remaining 380,332.75 hectares is classified as alienable and disposable, 92% of which is utilized for agricultural production.</p> <p>This STCBF project will be implemented to address the problems on cacao production sustainability in relation to the reported climate change in the country. The project will focus on the establishment of HYV bud-wood garden and nursery and the adoption of organic farming, intercropping schemes and water impounding.</p>	<p>Year 1:</p> <p>PEOPLE AND SERVICES:</p> <p>Capacitated at least 42 cacao farmers, CMU staff, and LGU technicians on cacao nursery, bud-wood garden and plantation establishment and management;</p> <p>Established one hectare@cacao nursery and budwood garden under the CMU management;</p> <p>Promoted cacao nursery-budwood garden technologies thru Technology Field Day and/or cross visits;</p> <p>PARTNERSHIPS AND PLACES:</p> <p>Established and maintained at least eight linkages with various@cacao stakeholders;</p> <p>Organized four (4) clusters of 37 cacao farmers from four (4) municipalities;</p> <p>PUBLICATIONS:</p> <p>Developed, translated and/or distributed at least one IEC materials/ training modules and videography;</p> <p>Year 2:</p> <p>PRODUCT:</p> <p>80,000 QPMs of cacao HYV grafted seedlings</p> <p>PEOPLE AND SERVICES:</p> <p>Maintained the one-hectare accredited cacao nursery and budwood garden under the CMU management;</p> <p>Capacitated at least 42@cacao farmers, CMU staff, and LGU technicians on</p>	CMU	Cacao tree growers and other farmers	1-Aug-16	31-Jul-19	ONGOING	4,724,072.71	449,841.75

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	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.	1) Produced 10,000 seedlings of quality planting materials from genetically superior Gmelina 2) Identified and capacitated 30 tree farmers in Isabela 3) Conducted 8 trainings 4) Signed 5 MOAs with partner agencies 5) Produced 5 IEC materials and 1 publishable article on the profitability of Gmelina-based agroforestry systems 6) Provided 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	NEW	4,998,834.00	1,566,783.00
	S&T Community-Based Model Farm (STCBMF) on Bamboo and Bamboo Woven Products: An Eco-/Agri-Tourism Theme Park in Maasin, Iloilo	KRA 3: Rapid, Inclusive and Sustained Economic Growth	<p>The municipality of Maasin, Iloilo is popularly known for its bamboo and bamboo woven products. As a traditional commodity, skills in weaving, to include the traditional practices in raising bamboo plantations for pole production, though oftentimes more destructive rather than sustainable, has been passed on from generation to generation. Considered a critical watershed and having been proclaimed a watershed forest reserve, the uplands of Maasin is a mixture of forest tree species whose lowland portion is dominated by Kawayan tinik (Bambusa blumeana). Hence, majority of its residents make their living out of the bamboo resources which were actually established by their forefathers.</p> <p>Having been recognized by PCAARRD as one of the bamboo-producing municipality nationwide, Maasin has been the subject of two (2) previous projects focused on introducing S&amp;T interventions: the first one is the S&amp;T-Based Farm (STBF), established in the bamboo farm of a Magsasaka-Siyentista to showcase among others the S&amp;T interventions on bamboo rehabilitation technology and on manufacture of bamboo woven products; and the second project was the expanded version of the STBF â€” expanding the implementation of STBF among 50 farmer-cooperators who are members of a locally-federated peopleâ€™s organization known as Katilingban sang Pumuluyo nga naga Atipan sa Watershed sang Maasin (KAPAWA).</p> <p>While the two (2) previous bamboo-related projects translated the S&amp;T interventions to increasing bamboo production, this proposed S&amp;T Model Farm shall consolidate the S&amp;T interventions in bamboo farms in five communities that would fill the gaps in the value chain of enhancing production of bamboo woven products. The model farms will showcase the following S&amp;T interventions: increasing bamboo production through increased bamboo plantation hectarage;</p>	<p>1. Established the following model farms, each with its own special feature:</p> <ul style="list-style-type: none"> <li>a. Model bamboo nursery of Buntalan;</li> <li>b. Model farm of Daja featuring rehabilitated bamboo plantation;</li> <li>c. Model farm of Abay for a newly-established bamboo plantation in plain/flat areas;</li> <li>d. Model farm of Dagami for a newly-established bamboo plantation in hilly/sloping areas; and</li> <li>e. Model facility of Bolo for bamboo post-harvest processing and weaving</li> </ul> <p>2. Established and/or strengthened six (6) linkages, namely, DOST-PSTU Iloilo, DOT R6, DTI-Iloilo, LGU-Maasin, LGU Alimodian, and LGU-January</p> <p>3. Launched and established the eco-agritourism business development plan for Maasin, Iloilo</p> <p>4. Promoted the ISP-based technology convergence as a techno tourism or techno radiation program to at least two neighboring municipalities</p> <p>5. Developed at least one local (gender-sensitive) policy/ordinance relevant to the bamboo ISP</p> <p>6. Conducted at least two capacity building activities</p>	ERDB	Bamboo Growers/Weavers (directly); KAPAWA members and Maasin community; neighboring towns (indirectly)	1-Mar-16	31-Dec-19	ONGOING	3,758,812.00	372,022.01
	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	<p>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.</p> <p>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.).</p> <p>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</p>	<p>1. 30,000 Seedlings produced from selected sources</p> <p>2. 1 S&amp;T community-based farm with expansion</p> <p>3. 1 SSO established</p> <p>4. 1 farmer group with 30 farmer cooperators organized</p> <p>5. 30 farmer cooperators capabilities enhanced</p> <p>6. 1 farmers' field day conducted</p> <p>7. 1 Techno guide packaged</p> <p>8. 1 documentary video produced</p> <p>9. 1 MOA forged</p> <p>10. provided policy inputs</p>	ERDB	Tree farmers in Tagbalili, Esperanza, Agusan del	1-Jul-19	30-Jun-22	NEW	4,998,854.00	807,661.40

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	SAFE Project on Philippine Native Animals for Disaster Risk Reduction in Hazard-Prone Areas of Benguet (SAFE-PNADRRHAB) (Old Title: SAFE Project on Philippine Native Animals for Disaster Risk Reduction with the Integration of RFID System for Identification, Traceability and Tracking of Distributed Stock in Hazard-Prone Areas of Benguet)	KRA 5: Integrity of the Environment and Climate Change Mitigation and Adaption	<p>The provision of livestock to rehabilitate livelihoods after humanitarian disasters has been practiced regularly for over thirty years. This is often in the form of herd reconstitution for those largely dependent upon livestock following massive animal mortality.</p> <p>This SAFE project is proposed in an attempt to provide assistance to disaster-prone communities in Benguet both to prevent large damages and massive animal losses as well as to support in faster rebuilding following a major crisis event caused by natural hazards and climate-related disasters. The SAFE project will utilize the initial outputs of the PCAARRD funded program on Philippine Native Pig Conservation, Improvement and Profitable Utilization. It will operationalize a paradigm shift from reactive emergency relief to pro-active disaster risk reduction measures.</p>	<p>Publications - 6 different IEC material topics, 2 training modules</p> <p>Patent - 1 geographic indication filed; 1 Trademark/Collective mark filed</p> <p>Product- 1 native pig strain developed;</p> <p>People and services - 1 native animal facility for breeding and conservation; At least 30 farmer cooperators involved in SAFE project; At least 10 technical personnel trained</p> <p>Places and Partnership- 1 MOA signed among stakeholders; 15 breeders distributed to established SAFER farms</p> <p>Policy - 3 policy recommendations developed</p>	BSU	Indigenous people and women in disaster-prone upland communities	1-Mar-18	29-Feb-20	ONGOING	4,883,288.00	1,425,453.38
	Sustaining Crop Productivity in Climate Vulnerable Areas in Ilocos Norte through STCBF on Climate Resilient Technologies	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Climate resilient crops in the region will be given priorities to help community members adapt with the effect of climate change. The project will be implemented to enhance knowledge and skills of the community people on the use of climate resilient crops to improve farm productivity and consequently improve the lives of the community people in Ilocos Norte	<p>1. Established 10 demo projects to showcase the potential of various crops resilient varieties;</p> <p>2. Increased farm productivity through utilization of integrated appropriate crop-based farming technologies;</p> <p>3. Enhanced the capability of 500 stakeholders</p> <p>4. Produced, translated and distributed 5 titles of POT on various climate resilient crops;</p> <p>5. Conducted one school on the air on climate change</p> <p>6. Enhanced participation and empowerment of the community members</p> <p>7. Assisted 400 technology adoptors on recommended technologies</p> <p>8. Initiated policy development and advocacy together with various stakeholders;</p> <p>9. Conducted M&amp;E on technology adoption</p> <p>Year 1:</p> <p>PRODUCT:</p> <p>12 tons of rice seed produced; 5 tons of peanut seed produced; 12 tons of corn seeds produced</p> <p>PEOPLE AND SERVICES:</p> <p>1,- Assisted 150 technology adoptors on recommended technologies.</p> <p>1,- Conducted one School on the Air/broadcast activities on Climate Change and the climate resilient technologies</p> <p>PLACES AND PARTNERSHIPS:</p> <p>Signed 150 contracts with farmer beneficiaries and 5 MOA with LGU</p>	MMSU	300 community members from one city and six municipalities of Ilocos Norte.	1-Jul-17	31-Dec-19	ONGOING	4,915,348.00	595,502.72

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
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 people'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	UPLB	CBFM Beneficiaries	1-Jul-19	30-Jun-22	NEW	14,822,836.00	4,747,182.00
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	NEW	8,494,080.00	3,823,732.00

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
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	<p>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€”Community Empowerment thru Science and Technologyâ€”ubbed 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&amp;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.</p> <p>As part of poverty elimination, the use of forest resources will help lift a householdâ€™s status. In the publication, â€”Managing Ecosystems to Fight Povertyâ€”four main strategies are identified to improve the poverty reduction potential of local ecosystems. These include:</p> <ol style="list-style-type: none"> <li>1.â€”Strengthening resource management to ensure higher productivity and greater returns;</li> <li>2.â€”Improving governance so that the poor are empowered to "profit from nature";</li> <li>3.â€”Commercializing goods and services through marketing and enterprise development;</li> <li>4.â€”Developing mechanisms for payments for environmental services (WRI et al., 2005).</li> </ol> <p>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</p>	<p>4 CNA profile produced</p> <p>4 assessment reports</p> <p>4 profitability analysis produced</p> <p>4 units ARG</p> <p>1 unit LGUIDS</p> <p>1 unit WLMS</p> <p>2 units EWS</p> <p>80 CBFM members participated in the CNA/TNA, trained on livelihood equipment</p> <p>14 trainings condctued</p> <p>13 MOAs forged</p> <p>4 linkages</p> <p>16 IEC materials produced</p> <p>4 AVPs produced</p> <p>16 copyrights filed</p>	DOST 4A	CBFM Beneficiaries	1-Jul-19	30-Jun-22	NEW	9,424,458.00	1,070,200.00
Developing the Intellectual Property and Technology Business Management (IP-TBM) Operations in Consortia Member Agencies - Batch 2	IP-TBM Coordination and Capacity Building (Old Title: Establishment and Enhancing Intellectual Property (IP) Management and Business Development Office in Consortia Member Agencies)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	To encourage, support and nurture the development of mature agriaqua technologies into viable agri-business commercial ventures for the creation of wealth, employment and economic development.		FPRDI	Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs/RDI Technology transfer officers/managers SUC/RDI Researchers/Inventors	16-Jul-18	15-Jul-20	ONGOING	7,435,830.00	736,685.60
Developing the Intellectual Property and Technology Business Management (IP-TBM) Operations in Consortia Member Agencies - Batch 2	Project 1. Enhancing, Indigenizing and Operationalizing Intellectual Property (IP) Management and Business Development Office in Ifugao State University	KRA 3: Rapid, Inclusive and Sustained Economic Growth	<p>Ifugao state university is the only premier university in Ifugao. There are 6 different campuses strategically located in the different municipalities in the province. This six campuses offered different programs. In line with the vision of the university to become an Academic Center of Excellence (ACE), the university aims to be a Center of excellence in instruction, research and extension, IGP projects, Administration and good Governance. Research and extension is one of the challenges of the university in order to obtain higher SUC levelling status, thus the university encourages and support the funding of researchers, especially inventors in their quest for research publications, patenting and utility model publications. With these challenges the university in partnership with the Intellectual property Office conducts a yearly seminar in writing proposals for Utility model, patenting, and Copyright especially the products of researches. As of December 2017 there are 63 Utility models approved and published by the Intellectual Property Office (IPO). There are still 11 utility model applications by university submitted and ready for the confirmation and approval by the Intellectual Property Rights (IPO).</p> <p>This utility model and patenting publication is one of the criteria that elevated the university from a SUC Level 3 to a SUC Level 4 status. The first approved and published utility model in the university is entitled as â€”Process of producing rice wine fermented with yeast patties and rice wine produces there fromâ€”Authored by Josephine Guimpatan. In order to properly utilize the following products for profit, intensive commercialization should be realized and be taken into consideration.</p>	<p>Y1 - 1 inventory of IP assets</p> <p>- At least 1 IP-TBM staff extensively trained under the IP Master Class and Technology Commercialization Mentorship Series</p> <p>- At least 1 IP-TBM staff attended a local IP workshop</p> <p>- At least 1 promotional IEC for SUC/RDI technologies</p> <p>- At least 2 IP (patent and utility model only) applications</p> <p>- 1 IP-TBM established/enhanced</p> <p>- 1 Letter of Commitment from SUC/RDI</p> <p>- 1 Memorandum of Agreement signed</p> <p>- At least 1 partnership agreement with the Philippine Chamber of Commerce Inc./Business Groups/Marketing or Trade Institutions</p> <p>- 1 Institutional IP Policy reviewed/ crafted</p> <p>- 1 Technology Transfer Protocol reviewed/ crafted</p> <p>Y2 - At least 1 Technology Commercialized</p> <p>- At least 1 IP-TBM staff attended a foreign IP workshop</p> <p>- At least 20 SUC/RDI trained (short duration/echo seminar) on IP Management and Technology Commercialization with IP-TBM staff as trainor/speaker</p> <p>- At least 2 networking events and technology promotion conducted by the SUC/RDI</p> <p>- At least 1 technology taker/adopter</p> <p>- At least 1 promotional IEC for SUC/RDI technologies</p> <p>- At least 3 IP (patent and utility model only) applications</p> <p>- 1 IP-TBM institutionalized</p> <p>- At least 1 commercialization agreement executed</p>	IFSU	Ifugao State University its Counterpart and the Different stakeholder of the University	16-Jul-18	15-Jul-20	ONGOING	2,210,069.00	424,722.00



Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
Developing the Intellectual Property and Technology Business Management (IP-TBM) Operations in Consortia Member Agencies - Batch 2	Project 10. Strengthening the Capacity of Bohol Island State University (BISU) on Intellectual Property and Technology Business Management (IP-TBM) for Sustained Technology Commercialization	KRA 3: Rapid, Inclusive and Sustained Economic Growth	<p>This proposed project, under the Intellectual Property Management and Business Development (IP-TBM) program, envisions to mirror the initiatives of the DPITC. The Innovation and Technology Support Office (ITSO) at BISU was established in 2013. It was manned by Mr. Bernabe Mejares from 2013 to 2016. Accomplishments of the ITSO Office for the first four (4) years of its operations were merely participation of the Office Incharge (Mr. Mejares) and some selected faculty members in local and national trainings. The importance of IPR protection has been imbibed in the whole university system, though each of the six (6) campuses has its own separate independent plan for IPR protection. For instance, the budget for the 2018 operations of the ITSO at BISU Main Campus is around Php500,000.00 which includes P250,000.00 for the regular operations including hiring of staff and conduct of in-service trainings; P50,000.00 for IPR protection; and Php200,000 for commercialization. The R&amp;D Office at BISU Bilar (Agricultural Campus), on the other hand, appropriated an amount of P200,000.00 solely for IPR protection and commercialization. The Intellectual Property (IP) Policy of BISU has been finalized in 2014, but since then it has not undergone any review. There were plans of reviewing the IP policy but it has not been done since its creation. Therefore, one of the major activities in the IP-TBM Enhancement Project, if funding will be provided by PCAARRD, is the IP policy review since it serves as the guiding principle and the legal basis in the conduct of organization's technology transfer activities.</p> <p>It is timely that a funding from PCAARRD will be made available for the sustained university-wide operation of the ITSO (soon IP-TBM) as a separate independent unit from R&amp;D for the whole university. It is expected that the IP-TBM, to-be-situated at the BISU Main Campus, will spearhead the unified management and protection of intellectual property generated at the university by its faculty,</p>	<p>Year 1:</p> <ul style="list-style-type: none"> <li>i. At least 1 inventory of IP assets</li> <li>i. At least 1 IP-TBM staff extensively trained under the IP Master Class and Technology Commercialization Mentorship Series</li> <li>i. At least 1 IP-TBM staff attended a local IP workshop/fora</li> <li>i. At least 1 promotional IECs for SUC/RDI technologies</li> <li>i. At least 2 IP (patent and utility model only) applications</li> <li>i. 1 IP-TBM established/enhanced</li> <li>i. 1 Institutional IP Policy reviewed/ crafted</li> </ul> <p>Year 2:</p> <ul style="list-style-type: none"> <li>i. At least 1 Technology Commercialized</li> <li>i. At least 1 IP-TBM staff attended a foreign IP workshop/for a</li> <li>i. At least 20 SUC/RDI trained (short duration/echo seminar) on IP Management and Technology Commercialization with IPTBM staff as trainer/speaker</li> <li>i. At least 2 networking events and technology promotion conducted by the SUC/RDI</li> <li>i. At least 1 promotional IECs for SUC/RDI technologies</li> <li>i. At least 3 IP (patent and utility model only) applications</li> <li>i. 1 IP-TBM institutionalized</li> </ul>	BISU	The project will benefit the Intellectual Property Office of the University, primarily. This represents the staff, the researchers, and the recipient of the seminar sponsored by the Office through the project, thus enhancing the technology transfer in the University. Indirect beneficiaries will go to the students of the University as the function of the Office will also encourage the students to participate in the objective of the Office through their studies. The community through technology adapters may also serve as potential beneficiaries.	16-Jul-18	15-Jul-20	ONGOING	3,232,007.00	405,086.50
Developing the Intellectual Property and Technology Business Management (IP-TBM) Operations in Consortia Member Agencies - Batch 2	Project 11. Strengthening the IP-TBM Operations in Samar State University (SSU)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project aims to strengthen the capacities of Intellectual Property and Technology Business Management (IP-TBM) Operations of Samar State University, Catbalogan City, Samar. Moreover, its goal is also to enhance their technology commercialization activities. Outputs of the project shall include training of at least one of IP-TBM staff under the IP Master Class and Technology Commercialization Mentorship Series which will be echoed to fellow researchers, publications, commercialization of at least one technology, industry partnerships and crafting or review of policies.	<p>Products</p> <ul style="list-style-type: none"> <li>1 inventory of IP assets</li> <li>At least 1 Technology Commercialized</li> </ul> <p>People and Services</p> <ul style="list-style-type: none"> <li>At least 1 IP-TBM staff extensively trained under the IP Master Class and Technology Commercialization Mentorship Series</li> <li>At least 1 IP-TBM staff attended a local/foreign IP workshop/fora</li> <li>At least 20 SUC/RDI trained (short duration/echo seminar) on IP Management and Technology Commercialization with IP-TBM staff as trainor/speaker</li> <li>At least 2 networking events and technology promotion conducted by the SUC/RDI</li> <li>At least 1 technology taker/adoptor</li> </ul> <p>Publications</p> <ul style="list-style-type: none"> <li>At least 4 promotional IECs for SSU technologies</li> </ul> <p>Patents</p> <ul style="list-style-type: none"> <li>At least 8 IP (patent and utility model only) applications</li> </ul> <p>Places and Partnerships</p> <ul style="list-style-type: none"> <li>1 IP-TBM enhanced/established and institutionalized</li> </ul>	SSU	Intellectual Property and Technology Business Management (IP-TBM) of Samar State University SSU Technology transfer officers/managers SSU Researchers/Inventors	16-Jul-18	15-Jul-20	ONGOING	2,333,354.00	446,407.63

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
Developing the Intellectual Property and Technology Business Management (IP-TBM) Operations in Consortia Member Agencies - Batch 2	Project 12. Enhancing the IP-TBM Operations in Western Mindanao State University (WMSU)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Establishment of a unit/ center that will facilitate the commercialization of technologies generated in the AANR sectors. It will be stationed at the University Research Center that would provide Institutional arrangement orientation and collaboration to different stakeholders; conduct of Policy review and IP audit; Training, mentorship, IP protection; Branding, technology promotion and advocacies, and Manage in business network, partnership and institutionalization. The implementation of the project is expected to impact to society in terms of technologies commercialized, jobs and income generated, products available at lower cost and the facilitation of R.A.10055.	<p>Products</p> <p>1 inventory of IP assets</p> <p>At least 1 Technology Commercialized</p> <p>People and Services</p> <p>At least 1 IP-TBM staff extensively trained under the IP Master Class and Technology Commercialization Mentorship Series</p> <p>At least 1 IP-TBM staff attended a local/foreign IP workshop/fora</p> <p>At least 20 SUC/RDI trained (short duration/echo seminar) on IP Management and Technology Commercialization with IP-TBM staff as trainor/speaker</p> <p>At least 2 networking events and technology promotion conducted by the SUC/RDI</p> <p>At least 1 technology taker/adoptor</p> <p>Publications</p> <p>At least 2 promotional IECs for SUC/RDI technologies</p> <p>Patents</p> <p>At least 5 IP (patent and utility model only) applications</p> <p>Places and Partnerships</p> <p>1 IP-TBM enhanced/established and institutionalized</p> <p>1 Letter of Commitment from SUC/RDI</p> <p>1 Memoranda of Agreement signed</p> <p>At least 1 partnership agreement with the Philippine Chamber of Commerce Inc./Business</p>	WMSU	Intellectual Property and Technology Business Management (IP-TBM) of the University; Technology transfer officers/managers SUC/RDI Researchers/Inventors	16-Jul-18	15-Jul-20	ONGOING	2,409,594.00	420,948.25
Developing the Intellectual Property and Technology Business Management (IP-TBM) Operations in Consortia Member Agencies - Batch 2	Project 13. Enhancing the IP-TBM Operations in Central Mindanao University (CMU)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Strengthening the capacity of CMU's IPLO for the Intellectual Property and Technology Business Management (IP-TBM) Operations, to be an operational one-stop-shop for technology owners and generators, investors, end users and other stakeholders to facilitate the commercialization of technologies generated, preferably along the AANR sectors	<p>Products</p> <p>1 inventory of IP assets</p> <p>At least 1 Technology Commercialized</p> <p>People and Services</p> <p>At least 1 IP-TBM staff extensively trained under the IP Master Class and Technology Commercialization Mentorship Series</p> <p>At least 1 IP-TBM staff attended a local/foreign IP workshop/fora</p> <p>At least 20 SUC/RDI trained (short duration/echo seminar) on IP Management and Technology Commercialization with IP-TBM staff as trainor/speaker</p> <p>At least 2 networking events and technology promotion conducted by the SUC/RDI</p> <p>At least 1 technology taker/adoptor</p> <p>Publications</p> <p>At least 2 promotional IECs for SUC/RDI technologies</p> <p>Patents</p> <p>At least 5 IP (patent and utility model only) applications</p> <p>Places and Partnerships</p> <p>1 IP-TBM enhanced/established and institutionalized</p>	CMU	Intellectual Property and Technology Business Management (IP-TBM) of CMU Technology transfer officers/managers CMU Researchers/Inventors	16-Jul-18	15-Jul-20	ONGOING	2,489,284.00	457,657.63

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
Developing the Intellectual Property and Technology Business Management (IP-TBM) Operations in Consortia Member Agencies - Batch 2	Project 14. Revitalizing the IP-TBM Operations in the University of Southern Mindanao (USM)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project is intended mainly to satisfy the role of the University of Southern Mindanao in the technology transfer aspect as mandated by Republic Act No. 10055 or the Act providing the framework and support system for the ownership, management, use and commercialization of intellectual property generated from research and development funded by government and for other purposes. The University of Southern Mindanao (USM) is a public research university in the Philippines, which upholds the four core functions in instruction, research generation, production and research and extension. Being a recipient of government funding it has established quality researches mainly in the field of agriculture. The University houses research centers such as the USM Agricultural Research Center (USMARC), Philippine Carabao Center (PCC) and the Philippine Industrial Crops Research Center (PICRI). A preliminary Intellectual Property guidelines, was initiated to cater intellectual property matters for researches generated in the University. These research stations have innovated molecular technologies in rubber industry and banana tissue culture, produced improved cultivar varieties of high value crops such as cacao, rice, corn and coffee, and has popularized biotechnology-enhanced dairy products such as carabao milk exclusive in the University. Up to this day, these research stations continues to perform its function in sustaining quality research outputs and developing knowledge-based tools and marketable agri-aqua products to serve as trademarks of the University. However, the potential of these outputs for patenting and commercialization has been limited as the role of intellectual property management system has not been fully realized in the University. Hence the initiative of this project is to revive the IP management system of the University and to provide a venue for enhancement of intellectual property from University-based researches through the establishment of IP-TBM Office. Also, there is an existing challenge and motivation for the	Year 1: i. At least 1 inventory of IP assets i. At least 1 IP-TBM staff extensively trained under the IP Master Class and Technology Commercialization Mentorship Series i. At least 1 IP-TBM staff attended a local IP workshop/fora i. At least 1 promotional IECs for SUC/RDI technologies i. At least 2 IP (patent and utility model only) applications i. 1 IP-TBM established/enhanced i. 1 Institutional IP Policy reviewed/ crafted Year 2: i. At least 1 Technology Commercialized i. At least 1 IP-TBM staff attended a foreign IP workshop/for a i. At least 20 SUC/RDI trained (short duration/echo seminar) on IP Management and Technology Commercialization with IP-TBM staff as trainer/speaker i. At least 2 networking events and technology promotion conducted by the SUC/RDI i. At least 1 promotional IECs for SUC/RDI technologies i. At least 3 IP (patent and utility model only) applications i. 1 IP-TBM institutionalized	USM	The project will benefit the Intellectual Property Office of the University, primarily. This represents the staff, the researchers, and the recipient of the seminar sponsored by the Office through the project, thus enhancing the technology transfer in the University. Indirect beneficiaries will go to the students of the University as the function of the Office will also encourage the students to participate in the objective of the Office through their studies. The community through technology adapters may also serve as potential beneficiaries.	16-Jul-18	15-Jul-20	ONGOING	2,368,297.00	417,045.00
Developing the Intellectual Property and Technology Business Management (IP-TBM) Operations in Consortia Member Agencies - Batch 2	Project 15. Enhancing the IP-TBM Operations in Caraga State University (CarSU)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project aims to capacitate and provide resources for the establishment and operationalization of the Intellectual Property and Technology Business Management (IP-TBM) in Caraga State University to pursue IP protection and technology transfer & commercialization activities	Products 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/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 technology taker/adopter  Publications At least 2 promotional IECs for SUC/RDI technologies  Patents At least 5 IP (patent and utility model only) applications  Places and Partnerships 1 IP-TBM enhanced/established and institutionalized  1 Letter of Commitment from SUC/RDI  1 Memoranda of Agreement signed	CarSU	Direct Beneficiaries: 1. CSU Researchers/Inventors 2. Intellectual Property and Technology Business Management (IP-TBM) Team in CSU 3. CSU TSO Technical Staff/Experts  Indirect Beneficiaries: 4. MSMEs in Caraga Region 5. Inventors in Caraga Region	16-Jul-18	15-Jul-20	ONGOING	3,611,304.00	412,889.50

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
Developing the Intellectual Property and Technology Business Management (IP-TBM) Operations in Consortia Member Agencies - Batch 2	Project 16. Enhancing the IP-TBM Operations in Maguindanao State University - Iligan Institute of Technology (MSU-IIT)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The project focuses on the establishment of Intellectual Property and Technology Business Management (IP-TBM) that mirrors DPITCs initiatives to strengthen the capacities of Mindanao State University - Iligan Institute of Technology (MSU-IIT) with sustainability interventions to enhance its technology commercialization activities.	Products 1 inventory of IP assets At least 1 Technology Commercialized  People and Services 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/foreign IP workshop/fora  At least 20 researchers of MSU-IIT/RDI trained (short duration/echo seminar) on IP Management and Technology Commercialization with IP-TBM staff as trainor/speaker  At least 2 networking events and technology promotion conducted by MSU-IIT/RDI through the IP-TBM  At least 1 technology taker/adoptor  Publications At least 2 promotional IECs for MSU-IIT/RDI technologies  Patents At least 5 IP (patent and utility model only) applications  Places and Partnerships 1 IP-TBM enhanced/established and institutionalized	MSU-IIT	Intellectual Property and Technology Business Management (IP-TBM) of MSU-Iligan Institute of Technology Technology Transfer personnel, officers, managers, researchers/inventors in MSU-IIT	16-Jul-18	15-Jul-20	ONGOING	2,731,771.00	374,782.63
Developing the Intellectual Property and Technology Business Management (IP-TBM) Operations in Consortia Member Agencies - Batch 2	Project 2. Strengthening and Sustaining the IP-TBM of Mariano Marcos State University (MMSU)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Mariano Marcos State University (MMSU) is a premier higher institution in the north that embodies the pursuit of excellence in the performance of its four-fold function of instruction, extension, research and production. It has proven itself to be an active partner in contributing improvement in the quality of life of community people through instruction, research and extension activities. In the exercise of performing its duties as an agent for adding to the body of knowledge through its researches, it has an increasing number of research outputs and generated technologies in various fields and disciplines. These outputs include copyrighted works, patented technologies and registered varieties that carry potential commercial value. With the support of government and private funding agencies, MMSU is provided with financial, technical and material support to conduct researches and further develop into technologies. At present, there are 42 knowledge products that are granted with IP protection in MMSU which include 1 patent, 1 trademark, 20 utility models, 16 copyright materials, and 4 NSIC Registered varieties which are ready for commercialization. However, there is a need to strengthen the technology protection, promotion and commercialization activities of the University Innovations and Technology Support Office (ITSO) of MMSU in order to take part in the achievement of the university's goal as one of the premiere university in the country by 2028. The Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD) through its platform: the Innovation and Technology Center (DPITC) has initiated the capacitation of SUCs in enhancing their technology promotion and commercialization activities through the application of innovative platforms in nurturing MMSU's human resources. In view of this, MMSU, with the technical support of DOST-PCAARRD-DPITC will establish the Intellectual	Year 1: i,- At least 1 inventory of IP assets i,- At least 1 IP-TBM staff extensively trained under the IP Master Class and Technology Commercialization Mentorship Series i,- At least 1 IP-TBM staff attended a local IP workshop/fora i,- At least 1 promotional IECs for SUC/RDI technologies i,- At least 2 IP (patent and utility model only) applications i,- 1 IP-TBM established/enhanced i,- 1 Institutional IP Policy reviewed/ crafted Year 2: i,- At least 1 Technology Commercialized i,- At least 1 IP-TBM staff attended a foreign IP workshop/for a i,- At least 20 SUC/RDI trained (short duration/echo seminar) on IP Management and Technology Commercialization with IP-TBM staff as trainer/speaker i,- At least 2 networking events and technology promotion conducted by the SUC/RDI i,- At least 1 promotional IECs for SUC/RDI technologies i,- At least 3 IP (patent and utility model only) applications	MMSU	Mariano Marcos State University's Faculty and Full-time Researchers and Inventor 3. Potential target technology adopters	16-Jul-18	15-Jul-20	ONGOING	2,166,895.00	404,276.00

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
Developing the Intellectual Property and Technology Business Management (IP-TBM) Operations in Consortia Member Agencies - Batch 2	Project 3. Enhancing the Intellectual Property and Technology Business Management (IP-TBM) Operations of Isabela State University (ISU)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Sound intellectual property (IP) management can help achieve a range of objectives such as securing investment, identifying and attracting potential partners of buyers, deriving value collaborations and managing litigation risks. The Isabela State University works to a significant degree with extension partners, in order to fill gaps in their own resources and expertise, and also because their expertise has been attractive to established players. However, collaboration carries the risk of knowledge leading to rivals, and this requires judicious management of intellectual assets. Given the limited resources, the establishment of the IP-TBM would be instrumental in developing innovative strategies that could enhance protection and management of IP. Research activities among SUCs seldom translate to commercialization activities due to lack of manpower and competencies in technology transfer and commercialization among researchers/ technology generators and technology transfer staff. While simple financial analyses can be prepared for technologies generated, researchers are generally at a loss when precommercialization requirements involve IP protection, business plans, market research, feasibility studies and technology valuation. Much more so, if the activities come to negotiations and licensing agreements, SUC staff, especially technology transfer officers need to be capacitated on these aspects. In the span of six years, ISU has increased the number of its IP registrations, but it still falls short compared to the number of R&D activities it has every year. Moreover, the DPITC envisions that ISU will be able to effectively carry out their IP management and commercialization functions. To achieve this, ISU need to have a unit that will perform these functions whose staff are properly and extensively capacitated. In essence, the DPITC will be mirrored in these units and shall be known as Intellectual Property and Technology Business Management (IP-TBM). Hence, this proposal.	Year 1 1. At least (one) 1 IP Management and Business Development Office Staff extensively trained on IP 2. At least (one) 1 Technology Transfer Office Personnel attended an IP-TBM workshop/fora (local/foreign). 3. One (1) Technology Transfer Office institutionalized 4. At Least 12 campus IP-TBM Coordinators trained (short duration) on IP management and Tech Commercialization (with TTO as trainer). 5. One (1) institutional IP Policy; One (1) Technology Transfer Protocol 6. One (1) inventory of IP assets Year 2 1. At least five (5) IP applications 2. At least two (2) promotional IECs for SUC/RDI technologies 3. At least one (1) technology taker/adopter 4. At least two (2) networking events and product promotion conducted by SUC/RDI 5. One (1) letter of commitment from ISU Officials/RDI; one (1) RFA; at least one (1) commercialization agreement forged; At least one (1) partnership agreement with Philippine Chamber of Commerce Inc./ Marketing/Trade Institution	ISU	1. Intellectual Property (IP) and Technology Business Management offices of ISUE/RDIs 2. Technology transfer officers/managers 3. ISUE/RDIs Researchers/Inventors 4. Farmers, Entrepreneurs/private organization	16-Jul-18	15-Jul-20	ONGOING	3,769,914.00	363,795.83
Developing the Intellectual Property and Technology Business Management (IP-TBM) Operations in Consortia Member Agencies - Batch 2	Project 4. Enhancing the Intellectual Property and Technology Business Management (IP-TBM) Operations of the Nueva Vizcaya State University (NVSU)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The Nueva Vizcaya State University, a 101 year old higher education institution in the Cagayan Valley Region takes pride not only in its strong academic programs but even in its institutionally and externally funded quality and relevant research outputs and technologies generated. NVSU also supports the Philippine Technology Transfer Act of 2009 (RA 100551), which mandates the access to technologies and knowledge generated from government-funded R&D by the greater public and considering at the same time the protection of intellectual property rights. Over the years, NVSU had already generated technologies. Some of this patented technologies are already utilized through the Extension Services, and there are some which can be utilized only through commercialization either by the University or private investors. Although, NVSU have an Intellectual Property Rights and Business Affairs Offices, technology commercialization have not yet actually taken place. The enhancement therefore of an Intellectual Property and Technology Business by capacitating IP-TBM personnel through extensive training in IP management and technology commercialization is needed so that these matured technologies may actually spur local economic development not only in the region but in the entire country as well.	i.; Conducted Inventory of IP assets i.; One (1) Technology Commercialized i.; One (01) IP-TBM Staff extensively trained under the IP Master class and Technology Commercialization Mentorship Series i.; 1 IP-TBM staff attended IP workshop/fora (foreign/local) i.; At least 20 SUC staff trained on IP management and technology commercialization (echo seminar) with IP-TBM staff as trainer/speaker i.; 1 technology transfer office institutionalized i.; 1 networking events and product promotions conducted by the SUC i.; 1 technology taker/adopter i.; At least 2 promotional IECs for NVSU technologies i.; 5 IP applications (patent and UM only) i.; 1 PMM-BDO established/enhanced and institutionalized i.; At least 1 commercialization agreement executed i.; 1 Letter of Commitment from NVSU i.; 1 Memorandum of Agreement signed i.; At least 1 partnership agreement with the Philippine Chamber of Commerce Inc. / Business Groups/marketing or trade institutions i.; 1 Institutional IP Policy reviewed/crafted i.; 1 technology transfer Protocol reviewed/crafted	NVSU	Inventors, scientists, entrepreneurs, writers, innovators, and students in the province of Nueva Vizcaya	16-Jul-18	15-Jul-20	ONGOING	2,639,990.00	395,637.63
Developing the Intellectual Property and Technology Business Management (IP-TBM) Operations in Consortia Member Agencies - Batch 2	Project 5. Establishment of the Intellectual Property and Technology Business Management (IP-TBM) in the Philippine Carabao Center (PCC) (Old Title: Establishment of Intellectual Property Management and Business Development Office (IPM-BDO) in Philippine Carabao Center)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	To encourage, support and nurture the development of mature agriagua technologies into viable agri-business commercial ventures for the creation of wealth, employment and economic development.	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 - At least 1 promotional IEC for SUC/RDI technologies - At least 2 IP (patent and utility model only) applications - 1 IP-TBM established/enhanced - 1 Letter of Commitment from SUC/RDI - 1 Memorandum of Agreement signed - At least 1 partnership agreement with the Philippine Chamber of Commerce Inc./Business Groups/Marketing or Trade Institutions - 1 Institutional IP Policy reviewed/ crafted - 1 Technology Transfer Protocol reviewed/ crafted	PCC	Intellectual Property and Technology Business Management (IP-TBM) of selected SUCs/RDIs Technology transfer officers/managers SUC/RDI Researchers/Inventors	16-Jul-18	15-Jul-20	ONGOING	2,793,104.00	387,867.53

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
Developing the Intellectual Property and Technology Business Management (IP-TBM) Operations in Consortia Member Agencies - Batch 2	Project 6. Enhancing the Intellectual Property and Technology Business Management (IP-TBM) of Pampanga Agricultural State University (PSAU) (Old Title: Enhancing and Operationalizing Intellectual Property Management and Business Development Office (IPM-BDO) of Pampanga State Agricultural University)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The Intellectual Property Management “Business Development Office will serve as an area for researchers and other individuals in gaining deeper understanding and appreciation on what Intellectual Property is all about. It will also serve as the backbone of the technologies generated from different research initiatives of the University.	Y1: a) 1 institutional IP Policy reviewed/ crafted b) 1 Technology Transfer Protocol reviewed/ crafted c) At least 1 IP Mgt. and Business Development Office Staff extensively trained on IP d) At least 1 Technology Transfer Office Personnel attended an IP-TBM workshop/for a e) At Least 20 SUC staff trained (short duration) on IP mngt. And Tech Commercialization(with TTO as trainer) f) 1 inventory of IP assets g) At least 2 IP applications h) At least 1 promotional IECs were published and disseminated i) at least 1 commercialization agreement; At least 1 partnership agreement with Philippine Chamber of Commerce Inc./ Marketing/Trade Institution Y2: a. At Least 20 SUC staff trained (short duration) on IP mngt. And Tech Commercialization(with TTO as trainer) b. At least 3 IP applications c. At least 1 promotional IECs were published and disseminated d. At least 1 Technology Commercialized	PSAU	The University, researchers, students and other interested individuals	16-Jul-18	15-Jul-20	ONGOING	2,369,104.00	409,481.75
Developing the Intellectual Property and Technology Business Management (IP-TBM) Operations in Consortia Member Agencies - Batch 2	Project 7. Enhancing and Strengthening the Intellectual Property and Technology Business Management (IP-TBM) Operations in Forest Products Research and Development Institute (FPRDI)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This project primarily aims to enhance and strengthen FPRDI’s capacity for a more effective and efficient IP management and commercialization system by providing its women and men engaged in technology transfer activities opportunities to hone their knowledge and skills thru highlevel trainings and mentorship programs. The activities under this project also include pro-active approach in promoting the technologies and services as well as in strengthening linkages with stakeholders by developing appropriate IEC materials, rendering echo seminars to researchers/inventors and formalizing partnerships with local industries and communities.	Products: 1 Inventory of IP assets At least 1 Technology Commercialized People and Services: 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/foreign IP workshop/fora At least 20 SUC/RDI trained (short duration/echo seminar) on IP Management and Technology Commercialization with IPTBM staff as trainor/speaker At least 2 networking events and technology promotion conducted by the SUC/RDI At least 1 technology taker/adopter Publications : At least 2 promotional IECs for SUC/RDI technologies Patents: At least 5 IP (patent and utility model only)	FPRDI	i. At least 2 FPRDI technology transfer personnel i. FPRDI researchers and scientists with patentable and/or commerciable technologies i. Prospective adoptors of IP-protected and/or commercable technologies in the local forest-based indsutries and communities	16-Jul-18	15-Jul-20	ONGOING	2,296,417.00	309,335.00

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
Developing the Intellectual Property and Technology Business Management (IP-TBM) Operations in Consortia Member Agencies - Batch 2	Project 8. Reestablishment and Enhancement of the Intellectual Property and Technology Business Management (IP-TBM) Operations in Laguna Polytechnic State University (LSPU)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	There is not yet established technology transfer system in LSPU as the role of intellectual property and technology transfer office needed to be defined further, thus a need to re-establish and enhance the technology transfer system.	Y1 - 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 - At least 1 promotional IEC for SUC/RDI technologies - At least 2 IP (patent and utility model only) applications - 1 IP-TBM established/enhanced - 1 Letter of Commitment from SUC/RDI - 1 Memorandum of Agreement signed - At least 1 partnership agreement with the Philippine Chamber of Commerce Inc./Business Groups/Marketing or Trade Institutions - 1 Institutional IP Policy reviewed/ crafted - 1 Technology Transfer Protocol reviewed/ crafted Y2 - At least 1 Technology Commercialized - At least 1 IP-TBM staff attended a foreign IP workshop - At least 20 SUC/RDI trained (short duration/echo seminar) on IP Management and Technology Commercialization with IP-TBM staff as trainor/speaker - At least 2 networking events and technology promotion conducted by the SUC/RDI - At least 1 technology taker/adopter	LSPU	University personnel, school stake holders, extension community, research and development department, students	16-Jul-18	15-Jul-20	ONGOING	1,917,844.00	388,512.53
Developing the Intellectual Property and Technology Business Management (IP-TBM) Operations in Consortia Member Agencies - Batch 2	Project 9. Enhancing the Intellectual Property and Technology Business Management (IP-TBM) Operations in Western Philippines University (WPU)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The ultimate goal is to establish the IP-TBM office in the campus. The IP-TBM will be the venue for intellectual property assistance and guide for researches, technology, and products generated in the university. Specifically, it will provide technical services on how to patent technologies or products for commercialization. The first quarter will cover review of previous guidelines existing in the University and its modification to cope up and associate with the recent improvements and issues on patenting, finalization of involved personnel, capacitating the technology transfer personnel of the University, and IP assets inventory. The succeeding months will be allotted for the improvement of the office, processing legalization documents and sealing of by-laws and newly-amended IP guidelines as well as delivery of outputs as means of assessment of objective realizations. Series of capacity building activities to enhance personnel on IP patenting processes and as well as echo-seminars in the academe level will be implemented. In this matter, the seminars will extend to students for them to inculcate awareness of the IP system in the university. In a way, this can also serve as a form of networking or promotional activities that could enhance responsiveness of IP awareness in the University. The second year of the project shall be focused on patent applications, establishment of technology transfer protocol, exploration and establishment of possible business partnerships and technology commercialization.	Products 1 inventory of IP assets At least 1 Technology Commercialized  People and Services 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/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 trainor/speaker  At least 2 networking events and technology promotion conducted by the SUC/RDI  At least 1 technology taker/adopter  Publications At least 2 promotional IECs for SUC/RDI technologies  Patents At least 5 IP (patent and utility model only) applications  Places and Partnerships	WPU	Intellectual Property and Technology Business Management (IP-TBM) of WPU Technology transfer officers/managers WPU Researchers/Inventors	16-Jul-18	15-Jul-20	ONGOING	2,344,846.00	373,047.58

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
Disaster Risk Reduction of Climate Change Impacts on Agricultural Farms in the Cordillera Administrative Region Program	Project 1. Disaster Risk Reduction of Climate Change Impacts on Vegetable Farms in Abra	KRA 5: Integrity of the Environment and Climate Change Mitigation and Adaption	<p>The project is focused on farmers because agriculture is the main livelihood activity in CAR. The proposed project will be implemented in partnership with other 5 SUCs and 12 MLGUs in CAR through MAO, the DRRMO and Farmers' Association.</p> <p>Abra as part of the Cordillera serves as the watershed of North Luzon. It hosts one of the major river basins in the country which have been affirmed to have enormous water-holding capacity à€” the Abra River. The Abra River Basin has a drainage area of 5,125 square kilometers, and extends to more or less the whole Abra province and to adjoining areas of the provinces of Apayao, Benguet, Kalinga, Ilocos Sur, Ilocos Norte, Ifugao and Mt. Province.</p> <p>The most frequent natural hazards that affected the province were flooding, landslides and ground shaking. These were either triggered by typhoons or earthquakes. There were 18 typhoons recorded that affected the province from 2001 to 2010. Flood prone/severe flooding mostly occurs in areas along the Abra River and its major tributaries affecting the municipalities of Manabo, Bucay, San Juan, Lagangilang, Dolores, Tayum, La Paz, Bangued and Pidigan. The occurrence of severe flooding in these areas is attributed by the river constricts at San Diego, Pidigan where only a passage of 200 m width is available for large floods resulting in a tail water effect.</p> <p>Typhoons with heavy winds and large amount of rainfall over the whole catchment area cause flooding. Because of the high density of the rain fall, the retention of the surface and the soil is small and only part of the water can be stored. The main part of the water flows quite fast to the smaller streams in the mountain region and then to the Abra River. Normally the flood level rises in about 6 to 10 hours to</p>	<p>Product: 2 structural windbreak; 2 training module</p> <p>People and Services: 2 farmer leaders and 7 LGU officials/employees trained as DRR pool of champions; 56 farmer cooperators trained; 2 womenâ€™s group capacitated</p> <p>Publication: 3 IEC materials; 2 popular articles; 1 video clip</p> <p>Places and Partnerships: 2 MOA forged DRR/CCAM sustainability</p> <p>Policy: 1 Policy recommendation on DRR/CCA for agriculture (barangay &amp; municipal Level)</p>	Abra State Institute of Science and Technology (ASIST)	LGUs and Abra farmers	1-Oct-17	31-Mar-20	ONGOING	6,991,032.00	896,980.60
Disaster Risk Reduction of Climate Change Impacts on Agricultural Farms in the Cordillera Administrative Region Program	Project 2. Disaster Risk Reduction of Climate Change Impacts in Agricultural Farms in Apayao Province	KRA 5: Integrity of the Environment and Climate Change Mitigation and Adaption	<p>The project is focused on farmers because agriculture is the main livelihood activity in CAR. The proposed project will be implemented in partnership with other 5 SUCs and 12 MLGUs in CAR through MAO, the DRRMO and Farmers' Association</p> <p>Apayao is largely an agricultural-based province of Cordillera Administrative Region (CAR). Farming is the dominant economic activity and opportunity in the province where majority of the crops are weather dependent. Climate change hazards can aggravate this, making the livelihood become vulnerable. Apayao climate falls under Corona Type II, characterized by no pronounced season, relatively wet from June to December and dry for the rest of the year. Heaviest rains occur during the months of August to October. Typhoons frequently occur during the period of July to October (SEP of Apayao, 2007). Based on the results of climate change vulnerability assessment conducted by Aman, R. (2015), in crop based farming communities of Apayao, typhoon, torrential rain, drought, increased incidence of pest and diseases, and soil erosion were the main climate-related hazards affecting crop productions in the province. The crop production areas are most exposed to typhoon, torrential rainfall, and increased incidence of pest, and erosion in upland areas. The study also assessed the technological adaptations of these farmers in the identified hazards. On typhoon, some farmers established windbreaks which are often use a single strip of vegetation. On prolonged rainfall, no technological adaptation was implemented likewise on drought, while on soil erosion, intercropping is the technology they implement. On the occurrence of pest and diseases, chemical spraying is the most convenient method for the farmers to control. These technological adaptations are not effective as they claimed.</p>	<p>Product: 2 Structural Windbreak; 2 Simple Drip Irrigation; 2 rain water harvesting tanks; BSU crop shelter; 1 training module</p> <p>People and Services: - 2 farmer leaders and 7 LGU officials/employees trained as DRR pool of champions; 56 farmer cooperators trained; 2 womenâ€™s group capacitated</p> <p>Publication: 3 IEC materials; 2 popular articles; 1 video clip;</p> <p>Places and Partnerships: 2 MOA forged DRR/CCAM sustainability</p> <p>Policy: 1 Policy recommendation on DRR/CCA for agriculture (barangay &amp; municipal Level)</p>	Apayao State College (ASC)	Farmers and LGUs of Apayao	1-Oct-17	31-Mar-20	ONGOING	6,289,950.00	352,155.70



Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
Disaster Risk Reduction of Climate Change Impacts on Agricultural Farms in the Cordillera Administrative Region Program	Project 3. Disaster Risk Reduction of Climate Change Impacts on Vulnerable Terrace Farms in Benguet	KRA 5: Integrity of the Environment and Climate Change Mitigation and Adaption	<p>The project is focused on farmers because agriculture is the main livelihood activity in CAR. The proposed project will be implemented in partnership with other 5 SUCs and 12 MLGUs in CAR through MAO, the DRRMO and Farmers' Association.</p> <p>Benguet is the second most vulnerable province to climate change hazards in the Philippines (Francisco and Anshony, 2010). Climate change is contributing to lower vegetable production and farm incomes in Benguet and is threatening agricultural land and water resource base. An increased frequency and magnitude of extreme weather conditions leads to the erosion of terraces. Strong winds, flooding, and longer periods of drought are reducing the quality and production of vegetable crops. Landslides are frequently destroying agricultural terraces, hence, increasing disaster.</p> <p>The establishing of more resilient terraces, the provision for wind barriers to reduce crop damage, and the improved management of irrigation water, could mitigate these climate change impacts on these unique and valuable agricultural resources and the increasingly vulnerable farm communities.</p>	<p>Product: 2 interlinked reinforced farms; 2 structural windbreaks; 2 tunnel type rain shelters; 2 training modules</p> <p>People and Services: 2 farmer leaders and 7 LGU officials/employees trained as DRR pool of champions; 56 farmer cooperators trained; 2 women's group capacitated</p> <p>Publication: 3 IEC materials; 2 popular</p> <p>Patent: 1 UM filed (structural windbreak)</p> <p>Places and Partnership: 2 MOA forged DRR/CCAM sustainability</p> <p>Policy: 1 Policy recommendation on DRR/CCA for agriculture (barangay &amp; municipal Level)</p>	BSU	LGUs and Farmers of Benguet	1-Oct-17	31-Mar-20	ONGOING	10,299,555.00	1,463,784.00
Disaster Risk Reduction of Climate Change Impacts on Agricultural Farms in the Cordillera Administrative Region Program	Project 4. Disaster Risk Reduction of Climate Change Impacts on Rice and Vegetable Farms in Ifugao (Old Title: Project 4. Disaster Risk Reduction of Climate Change Impacts on Legumes and Vegetable Farms in Ifugao)	KRA 5: Integrity of the Environment and Climate Change Mitigation and Adaption	<p>The project is focused on farmers because agriculture is the main livelihood activity in CAR. The proposed project will be implemented in partnership with other 5 SUCs and 12 MLGUs in CAR through MAO, the DRRMO and Farmers' Association.</p> <p>Ifugao is among the provinces vulnerable to the effect of climate change as shown by the frequent occurrence of erosion, floods and drought brought about by typhoons, high rainfall intensity and dry spell experienced for more than a month. Data taken from the Provincial Risk Reduction Management Office (PRRMO) Lagawe, Ifugao covering the period from 2011-2015 shows that agricultural damaged on rice caused by typhoon amounts to Php51,377,600.00 followed by vegetables with Php 3,532,490.00 recorded from 2011 to 2015. Record also shows that an estimated hectares of 1,968 planted with rice was affected by drought, 3,782 hectares for corn, including vegetables, a total estimated loss of Php 7,528,250.00 was recorded. An estimated amount worth Php1,249,500.00 agricultural damaged was recorded due to floods/landslide.</p> <p>On insect pest, diseases and other pest management practice, findings show that the use of synthetic insecticides to control pests is applied by 95% of the upland farmers. The major insect pests and diseases identified are; thrips, pod borers, whiteflies, diamond back moths, bugs, aphids, bean rust, stem rots and others like slugs. Majority of the farmers (69%) using synthetic pesticides spray these pesticides on a weekly basis while the rest of the farmers spray twice (2x) a week and once (1x) every after two weeks.</p> <p>On water management, farmers who have access to water sources like river and creeks knows when and how to water their plants. Findings show that 55% of the</p>	<p>Product: 2 rain water harvesting tanks; 2 training modules</p> <p>People and Services: 2 farmer leaders and 7 LGU officials/employees trained as DRR pool of champions; 56 farmer cooperators trained; 2 women's group capacitated</p> <p>Publication: 3 IEC materials; 2 popular articles; 1 video clip</p> <p>Places and Partnerships: 2 MOA forged DRR/CCAM sustainability</p> <p>Policy: 1 Policy recommendation on DRR/CCA for agriculture (barangay &amp; municipal Level)</p>	IFSU	LGUs and farmers	1-Oct-17	31-Mar-20	ONGOING	6,109,614.00	649,664.65

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
Disaster Risk Reduction of Climate Change Impacts on Agricultural Farms in the Cordillera Administrative Region Program	Project 5. Disaster Risk Reduction of Climate Change Impacts on Vulnerable Coffee Farms in Kalinga	KRA 5: Integrity of the Environment and Climate Change Mitigation and Adaption	<p>The project is focused on farmers because agriculture is the main livelihood activity in CAR. The proposed project will be implemented in partnership with other 5 SUCs and 12 MLGUs in CAR through MAO, the DRRMO and Farmers' Association</p> <p>The impact of climate change in a particular community depends upon the degree of exposure, sensitivity, potential impact and how farmers coped with climate change. Disasters and natural hazards by themselves do not cause disasters, but the combination of an exposed, vulnerable and ill-prepared community with a hazard event results in disaster. Climate change affects disaster risks in two ways. First through the likely increase in weather and climate hazards, and second through increase in the vulnerability of communities to natural hazards, particularly through ecosystem degradation, reductions in water and food availability, and changes to livelihood. Together, they reduce the capacities of communities to cope with natural hazards (ISDR 2008; 2009 as cited by Bayed et al.,2014).</p> <p>The coffee situation in relation to climate change: The issue of how climate change is affecting coffee production hit the headlines recently after the publication of a new report from the Climate Institute, which claims climate change will halve the area suitable for coffee production by 2050. Coffee crops are threatened by climate change in almost all coffee producing countries.</p> <p>Aaron Davis, senior research leader of plant resources at Royal Botanic Gardens, Kew, said that while some of the more recently published work on coffee and climate change is probably too pessimistic, it is very clear that coffee farming</p>	<p>Product: 2 rejuvenated coffee plantations; 2 rain water harvesting tanks; 2 training module</p> <p>People and Services: 2 farmer leaders and 7 LGU officials employees trained as DRR pool of champions; 56 farmer cooperators trained; 2 women's group capacitated</p> <p>Publication: 3 IEC materials; 2 popular articles; 1 video clip</p> <p>Places and Partnership: 2 MOA forged DRR/CCAM Sustainability</p> <p>Policy: 1 Policy recommendation on DRR/CCA for agriculture (barangay municipal Level)</p>	KSU	Coffee farmers in Kalinga	1-Oct-17	31-Mar-20	ONGOING	6,312,229.00	847,123.71
Disaster Risk Reduction of Climate Change Impacts on Agricultural Farms in the Cordillera Administrative Region Program	Project 6. Disaster Risk Reduction of Climate Change Impacts on Vulnerable Farms in Mountain Province	KRA 5: Integrity of the Environment and Climate Change Mitigation and Adaption	<p>The project is focused on farmers because agriculture is the main livelihood activity in CAR. The proposed project will be implemented in partnership with other 5 SUCs and 12 MLGUs in CAR through MAO, the DRRMO and Farmers' Association.</p> <p>Among the current issues and concern in vegetable production includes the continued deterioration of soil fertility especially in the municipality of Bauko where majority of commercial vegetables are produced (Recile, 2009; Claudio, 2009). In Mount Data plateau and adjacent production areas, water harvesting and use of windbreaks are rare. Strong winds are felt during the onset of rainy season to December while water shortage are felt from January to May. In spite of the natural phenomenon, farmers do not use wind breaks or maybe present but are not designed properly thus, effectiveness are not well appreciated. Water harvesting and drip irrigation are foreign to the farmers because they are used to gravitational irrigation where excessive use of water is common in this technique. In terms of soil management, most farms specially with slope gradient ranging from 30 degree or more are prone to various forms of erosions (Lasangen, 2004). Most terraces are prone to erosion during torrential rain because these are made of soil without reinforcement. In fact, during the onset of the typhoon Lawin in 2016, though the municipality was not directly hit by the typhoon, 155 Ha of land planted with various crops in upper Bauko were damaged (MDAR for HVCC, 2016). In terms of pesticides and fertilizers usage, farmers rely on traditional practices and experiences learned from co-farmers. Only two or three crops are used in their cropping patterns; majority of the farmers use the same crops per cropping or just follow the traditional cropping system that they used to practice. Those with green houses are farmers with direct buyers or supply contract. The SAFE project interventions will definitely contribute to the gaps mentioned above.</p>	<p>Product: 2 structural wind breaks; 2 rain water harvesting tanks; 2 tunnel type rain/crop shelters; 2 training modules</p> <p>People and Services: 2 barangays assisted; 2 farmer leaders and 7 LGU officials/employees trained as DRR pool of champions; 60 farmer cooperators trained; 2 women's group trained;</p> <p>Publication: 3 IEC materials; 2 popular articles; 1 video clip</p> <p>Places and Partnership: 2 MOA forged DRR/CCAM sustainability</p> <p>Policy: 1 Policy brief/recommendation on DRR/CCA for agriculture (barangay &amp; municipal Level)</p>	MPSPC	Farmers, LGUs	1-Oct-17	31-Mar-20	ONGOING	7,097,847.00	785,311.17

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
DOST-PCAARRD Technology Business Incubation (TBI) Program	DOST-PCAARRD-BSU Agriculture and Food Technology Business Incubator	KRA 3: Rapid, Inclusive and Sustained Economic Growth	<p>"Component 1.</p> <p>General Objectives:</p> <p>To encourage, support and nurture the development of mature agri-aqua-based technologies into viable agribusiness commercial ventures for the creation of wealth, employment and economic development.</p> <p>Specific objectives:</p> <p>1. To improve the national agri-aqua TBI program and ecosystem by establishing new &amp; strengthening existing TBIs; 2. To fast-track the incubation of start-ups through the active support of allied agencies and the private sector; 3. To organize and strengthen the different Agribusiness TBIs into a national network of Agribusiness TBIs; 4. To promote the soft-landing of foreign incubators in the local TBIs as well as the sale/licensing of technologies in other foreign TBIs.</p> <p>Component 2:</p> <p>General Objective:</p> <p>The project aims to strengthen the ATBIâ€™s capacity to assist its incubatees by enhancing its program and capacitating its human resources â€™ management team and its incubatees.      Specific Objectives: 1. To review and enhance the existing BSU ATBI/IC business plan; 2. To enhance the capabilities of the ATBI team on TBI management and operations, including among others, innovation and entrepreneurship; 3. To enhance the technical and entrepreneurial skills and competencies of incubatees; 4. To transfer six technologies; 5. To strengthen partnerships with public and private sectors; 6. To capacitate students on entrepreneurial skills and competencies; and   7. To disseminate information generated through the project. "</p>	<p>"Publications: At least 1 training module prepared, At least 2 publicationIEC material on TBI best practices developed</p> <p>Patents: At least 3 publications for copyright</p> <p>People and Services: At least 2 Local Training attended by TBI Management Staff per year, At least 2 Local Training attended by TBI Management Staff per year in the 1st 2 years, At least 1 International Training attended TBI Managers, At least 2 program reviews conducted per year, Agribusiness TBI Accelerator Program of SUCs</p> <p>Partnerships: Revive Partnerships and Linkages, 1 National Network Association of AgriAqua TBI formed, Minutes of organization meetings, Bylaws, Articles of Incorporation, SEC Registration, At least 2 membership in international TBI association, At least 2 Foreign companies endorsed for potential incubation</p> <p>Places: At least 6 TBI facilities provided with assistance "</p>	BSU	<p>"Component 1.</p> <p>MSMEs, spin-offs and start-ups in AANR enterprises;</p> <p>AFNR Graduates, Cooperatives.</p> <p>Component 2.</p> <p>Smallholder farmers and food processing entrepreneurs, students "</p>	1-Oct-17	31-Mar-20	ONGOING	10,113,468.00	782,858.23
DOST-PCAARRD Technology Business Incubation (TBI) Program	DOST-PCAARRD-CLSU Agriculture and Food Technology Business Incubator	KRA 3: Rapid, Inclusive and Sustained Economic Growth	<p>The Central Luzon State University is one of the most respected institutions of higher learning in the country. The university has distinguished itself as a generator of technologies in crops, livestock, inland fisheries, fruits and vegetables. Its technological breakthroughs are on tilapia, goats, carabao, grafted tomato, tissue â€™ cultured banana, mango, onions, aromatic rice and vegetables, and the like. However, the commercialization of the developed technologies has not accelerated faster than it should in the past years.</p> <p>It is in this context that in April 2009, the CLSU submitted a Project Proposal entitled: Establishment and Operation of the CLSU - TBI to speed up Commercialization and Development of Enterprises for Agriculture and Food-based Technologies to DOST-PCARRD for funding support.</p> <p>The CLSU Agriculture and Food Technology Business Incubator (CLSU-AFTBI) is a facility that assists in educating/training entrepreneurs and increasing the survival rate of</p> <p>Rev innovative start-up businesses. These 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 the countryâ€™s economic development.</p> <p>On June 9, 2010, DOST-PCAARRD provided initial fund amounting to Php28 M for CLSU-AFTBI establishment and initial operations. Through this fund, the CLSU-AFTBI was able to accomplish the following in its initial year:</p> <p>(1) Rehabilitated the food processing center (Php 6,470,473.00); (2) procured processing equipment and machineries (Php 15,073,594.78); (3) hired full-time manager; (4) conducted trainings; and (5) assisted five (5) production incubatees. Importantly, to sustain its operation, the CLSU-AFTBI operation was institutionalized under University Business Affairs Program (UBAP) in September 2011. From then on, the university has allocated budget through UBAP income</p>	<p>Products:</p> <p>Tilapia â€™ fingerling, dried, smoked, canned</p> <p>Goat â€™ upgraded goat, canned, ready to eat</p> <p>Mushroom â€™ fresh, dried, pickled, wine energy drink, capsule</p> <p>Mango â€™ production, pickled, dried, puree, wine, juice</p> <p>Onion â€™ fresh (organic), pickled, dried, powder</p> <p>Vegetables â€™ fresh (organic), vacuum packed, canned, bottled, pickled</p> <p>Rice â€™ aromatic rice, organic rice, rice byproduct</p> <p>Dairy Carabao â€™ processed milk products</p> <p>People and Services:</p> <p>No. of Incubatees accepted as start-up   9</p> <p>No. of Incubatees trained/monitored   9</p> <p>No. of incubatees graduated 9</p> <p>Partnerships: (Signed MOA)</p> <p>No. of Government Agencies 18 No. Private Agencies/Financial Institutions 4</p> <p>Places: Number of communities involved in incubation   8</p>	CLSU	<p>(1) AFNR Students and Graduates (2) Micro, Small and Medium Entrepreneurs (MSMEs) (3) Established companies (4) Start-up and spin off companies (5) Farmer Entrepreneurs (6) CLSU Faculty and Staff (7) Business Organizations/Cooperatives (8) Local Government Units</p>	1-Oct-17	31-Dec-19	ONGOING	9,826,839.00	666,254.40

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status 'As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
DOST-PCAARRD Technology Business Incubation (TBI) Program	DOST-PCAARRD-ISU Livestock Technology Business Incubator	KRA 3: Rapid, Inclusive and Sustained Economic Growth	In the Philippines, TBI is one of the strategies identified by the Department of Science and Technology (DOST). In general, it involves an ecosystem where innovation is promoted and supported towards commercialization. The facility aims to help start-up technology-based businesses by providing wide range of resources, services and facilities that are needed during the development stage. The main goal of TBI is to produce firms that will be subjected to incubation program and will leave the incubation program financially viable; can sustain its operation and can compete in the market. In 2011, the Isabela State University has created the Cagayan Valley Small Ruminants Research Center (CVSRRC) to cater goat and sheep R&D and extension programs. Under the assistance of DOSTPCAARRD, facilities has developed, which make the center more conducive for R&D activities, training ground for raisers and students Among the products and processes developed by CVSRRC that are already introduced to bigger set of clients are the following: 1. Canned chevon products under the trade name, Chevon Valley was already commercialized thru Agricomponent Corporation; 2. Processes on slaughtering goat and chevon cutting is already passed to the Department of Agriculture and registered as Philippine National Standard, recognized by the World Trade Organization; 3. Improved semen extender named as SemEx has already promoted through the Technology Transfer Program of DOST-TAPI and DOST-PCAARRD-TTPD; 4. At present, the product is also being used in different established community-based semen processing laboratory under the National S&T Program on Slaughter and Dairy Goat; 5. The delivery systems for artificial insemination has already institutionalized as part of the Unified National Artificial Insemination Program of BAI. Considering that there are facilities already established to support technology	1. Publications - At least 3 curriculum of the offered courses finalized (Y1) 2. Patents - 3. Products - 4. People and Services - At least 3 Formalized trainings on business incubation offered (Y1) - At least 10-15 enrollees with increased awareness on technology and business management (Y1) - At least 10 Potential incubatees identified (Y1-Y2) - At least 3 Trainings for entrepreneurs conducted and skill and knowledge enhanced (Y1-Y2) - At least 10-15 Enterprises established (Y1-Y2) - At least 3 Existing products and newly developed products commercialized (Y1-Y2) - At least 3 Market studies conducted (Y1-Y2) - At least 3 Products are positioned to market (Y1-Y2) - At least 10 Enterprises monitored (Y1-Y2) - Profit from enterprises determined (Y1-Y2) 5. Places and Partnership - At least 3 MOUs forged with industry partners (Y1) - Office space for TBI repaired (Y1) - 18 Additional equipment purchased to increase production rate (Y1) 6. Policies - IRR on TBI Operation approved by ISU Board (Y1)	ISU	AFNR Graduates, MSMes	1-Oct-17	31-Mar-20	ONGOING	17,293,636.57	453,125.20
DOST-PCAARRD Technology Business Incubation (TBI) Program	DOST-PCAARRD-UPV Fisheries Technology Business Incubator	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The Fisheries TBI (FTBI) is part of UPV&C's long-term plan to establish a Food Innovation and Start-ups Hub (FISH) at UPV Miagao Campus. The FISH aims to integrate the translation of R&D initiatives and outputs of all the colleges and research units of UPV. The FTBI is intended to be a technology transfer and commercialization support facility that aims to translate through technology-based enterprise development the technologies and innovations generated under the College of Fisheries and Ocean Sciences into products and services for the use and benefit of the greater society. Through FTBI, the University will make available its identified 10-15 matured technologies for business incubation and commercialization, with top priority to technologies funded by PCAARRD-DOST. Furthermore, it aims to hone and develop prospective techno-preneurs in the fishery sector by providing them a business enabling facility and an entrepreneurial ecosystem wherein they can nurture and accelerate the development of their technology-based businesses at a subsidized cost and minimal business risks.	a) Technology Transfer and Commercialization b) Technology-based Business Creation c) Business Incubation Capability Building d) Innovation and Entrepreneurial Ecosystem Promotion e) FTBI Team, Industry and Funding Partnership Formation f) FTBI Facility Development g) FTBI Socio-economic Development	UPV	UPV Community LGU Miagao & Fisherfolks and the community Province of Iloilo Fishery industry sector General public consumers	1-Oct-17	30-Sep-19	ONGOING	18,223,776.60	1,734,627.20
DOST-PCAARRD Technology Business Incubation (TBI) Program	DOST-PCAARRD-VSU Agriculture and Food Technology Business Incubator	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The idea of establishing a TBI that focuses on Agriculture and Food Technologies at the Visayas State University (TBI@VSU) is brought about by three important reasons:  1. First, is the decline of enrollment in Agriculture, Aquatic and Natural Resources (AANR) courses a decade ago, which alarmed this largely agricultural country - Philippines  2. Second, is the slow translation of agriculture and food technologies to commercial products in the market  3. Fulfilling the role and adhering to the core values of VSU  It is in these light that the VSU in partnership with VICAARP envisages the establishment of AFTBI@VSU. The AFTBI@VSU is designed to encourage and support the development of technology-based businesses by AANR students and graduates, growers, processors and entrepreneurs. The AFTBI@VSU though focused on agriculture and food will not preclude tenants/incubates who choose to engage in business ventures that are focused on forestry and natural resources technologies. The TBI is expected to fast track the commercialization of AANR technologies that consequently promote domestic resource exploitation and improve competitiveness of the region.	Product: At least 7 Technology-based commercial products and businesses People and Services: At least 7 New entrepreneurs 1 Pool of TBI managers/administrators Publication: At least 1 Publication on experiences of VSU in technology commercialization thru TBI Patent: At least 3 trademarks Places and Partnerships: Partnerships with the chambers of commerce/Industry; At least 7 MOAs with incubates Policy: 1 Refined TBI Policies	VSU	Students in agriculture, forestry and natural resources FWS, farmers, processors, individual or groups interested to venture into AANR technology commercialization Farmers producing the needed raw materials for processing Labor sector/service providers ( from various employment and service opportunities from the farm to the market); Traders and retailers Local, regional and national economies	1-Jan-18	31-Mar-20	ONGOING	34,928,614.00	1,397,222.00

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
DOST-PCAARRD Technology Business Incubation (TBI) Program Batch 2	Project 1. TBI Program Management, Networking, and Capacity Building	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Commercialization of technologies that were developed from government funding is a relatively unexplored area by both GFAs and RDIs in the Philippines, and not surprisingly viewed as significantly below its potential for evolving to later stages of research, advancing welfare of Filipinos, and spurring economic growth. Since the law took effect, several commercialization efforts of locally developed technologies with government support took off. Unfortunately, technology managers are perhaps, relatively inexperienced and may have been unable to negotiate the best position for the commercialization of their technologies. There may also be a need for other modalities by which these technologies should be promoted and transferred to target clients. By virtue of RA 10055, PCAARRD has effectively acquired additional mandate for technology transfer, since as a GFA, PCAARRD is mandated to provide assistance to RDIs in protecting and managing Intellectual properties, including commercialization. In March 2016, PCAARRD launched the DOST-PCAARRD Innovation and Technology Center (DPITC). The DPITC is envisioned to serve as a one-stop hub for technology owners and generators, investors, end users and other stakeholders to facilitate the commercialization of technologies generated in the AANR sectors. The Philippine Development Plan (PDP) 2017-2022 promotes the improvement of the mechanism for the diffusion and utilization of technologies through the establishment of innovation hubs such as the food innovation centers, technology business incubators (TBIs) and shared service facilities. The government therefore aims to proliferate TBIs by instituting the establishment of new TBIs in partnership with the private sector and higher educational institutions.	1 training module prepared 1 Annual Report prepared 2 IEC materials on TBI best practices developed At least 3 publications for copyright filed At least 2 national trainings attended by TBI management and staff At least 16 TBI personnel trained on TBI management At least 2 program reviews conducted At least 4 partnerships/linkages developed/enhanced 8 TBIs joined 1 National Network/Association of Agri-Aqua TBI At least 8 TBIs provided with assistance	BSU	For this Project: 8 TBIs For the 8 TBIs: MSMEs, spin-offs and start-ups in AANR enterprises, AFNR graduates, cooperatives, associations	16-Aug-18	15-Aug-20	ONGOING	5,169,824.00	1,847,068.00
DOST-PCAARRD Technology Business Incubation (TBI) Program Batch 2	Project 2. DOST-PCAARRD-CapSU Agriculture and Aquaculture Technology Business Incubator	KRA 3: Rapid, Inclusive and Sustained Economic Growth	On its effort to enhance Research and Development (R&D) on AgriAqua, Capiz State University had established the Crop Research and Development Center (CRDC), Livestock Research and Development Center (LRDC) and the Aqua-Marine and Food Technology Research Center. Further, the university had registered 23 Utility Models and 1 patent to IPOPHIL. Recently, 22 more technologies were filed to IPOPHIL and was published to its Gazette. Many of this technologies were funded by DOST and more particularly by PCAARRD. With this, the University has been exploring many ways on how to maximize and deliver its potential agri-aqua technologies to the benefit of the public and the private sectors through its Intellectual Property Management Office (IPMO). One of the identified strategic ways of translating R&D outputs to the market is the establishment of an Agri-Aqua Technology Business Incubator(ATBI). The proposed establishment of the Technology Business Incubation (TBI) will enable the University to deploy the strong technology portfolio of the three research centers. However, the university lacks the competency and financial capability to establish a TBI. Relative to this, establishment of an Agri-Aqua TBI through the funding and assistance of DOST-PCAARRD will us on our effort to institutionalize our Technology Transfer Office or future ATBI.	2 partnerships established and developed through MOA or MOU At least 7 ATBI-related IEC Materials Developed and disseminated At least 7 technology incubatees mentored/supported in the ATBI 7 Awareness Seminars/Promotional Activities Conducted for the ATBI 70 Participants/Attendees to the Awareness Seminars/ Promotional Activities At least 7 ATBI-related IEC Materials Developed and disseminated At least 7 ATBI trainings conducted for incubatees At least 7 technology incubatees recruited and mentored/supported in the ATBI At least one of technology matching/pitching activities 1 Networking Event conducted per year with at least 30 participants 15 jobs generated (direct or indirect) 2 Technologies Packaged on the 2nd year with at least 30% increase every year on the next 3 years. 7 technologies with IP Protection	CapSU	CAPSU Community (9 campuses) Municipalities in the Province of Capiz Agri-Fishery Industry sector SMEs NGOs	16-Aug-18	15-Aug-20	ONGOING	4,832,040.00	426,213.60

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
DOST-PCAARRD Technology Business Incubation (TBI) Program Batch 2	Project 3. DOST-PCAARRD-CMU Agriculture, Food, and Natural Resources Technology Business Incubator	KRA 3: Rapid, Inclusive and Sustained Economic Growth	<p>The Central Mindanao University is one of the leading universities in the fields of agriculture, forestry and related fields. Research, being one of the four-fold functions of CMU, generated technologies in different fields. However, commercialization of these technologies remains a cloudy realization. Business incubation is one of the ways to commercialize these technologies. It has been globally recognized as an important tool in economic development and job creation.</p> <p>The ATBI will be developed based on the need to commercialize researchbased technologies to its target clients. Some of the matured technologies spawned from CMU researches are mushroom production, vermicomposting, poultry, dairy and beef, swine, goat production. Thus, these technologies are the focus for incubation for the first two years of its operation. Incubatees will be guided in all aspects of starting up the business until they are able to stand on their own and finally manage their established business.</p> <p>Eventually, the ATBI will cater to other technologies generated by researchers and existing research centers in the university such as food processing and natural products.</p> <p>Lastly, the ATBI is a way of responding RA 10055 or the technology transfer act, mandating the institutions conducting research to look into technology transfer as one of their strategic mission so the technologies generated can be of use to the Filipino people.</p>	<p>Policy:</p> <p>Operational Procedure prepared 1</p> <p>List of ATBI Offerings prepared 1</p> <p>ATBI Curriculum prepared 1</p> <p>Training Modules prepared 6</p> <p>ATBI Business Plan prepared 1</p> <p>List of Technologies for Incubation prepared 1</p> <p>M&amp;E Instrument prepared 1</p> <p>ATBI Organization Structure with TOR developed 1</p> <p>Publication:</p> <p>Operations Manual published 1</p> <p>ATBI Service Offering published 1</p> <p>ATBI Curriculum published 1</p> <p>Training Modules published/printed 6</p> <p>ATBI Business Plan printed/published 1</p> <p>List of Technologies for Incubation printed/published 1</p> <p>IEC Material printed 2</p> <p>IEC Material disseminated 2</p> <p>Product:</p> <p>Equipment purchased 4</p> <p>Places and Partnership:</p> <p>TBI Facility set up 1</p> <p>Experts Pool established 1 1</p> <p>MOA/MOU forged 2</p> <p>Networking Activities conducted 1 1</p> <p>People and Services: 2 2</p> <p>Capability Building attended by ATBI Personnel 6 6</p>	CMU	Municipalities in the Province of Bukidnon Agri-Fishery Industry sector SMEs NGOs	16-Aug-18	15-Aug-20	ONGOING	4,730,270.00	423,604.80
DOST-PCAARRD Technology Business Incubation (TBI) Program Batch 2	Project 4. DOST-PCAARRD-DMMMSU Agriculture, Aquaculture, and Food Technology Business Incubator	KRA 3: Rapid, Inclusive and Sustained Economic Growth	<p>The Agriculture, Aquaculture, and Food Technology Business Incubator project will be established in DMMMSU, Bacnotan, La Union with two satellite stations in South La Union Campus at the College of Fisheries in Sto. Tomas, La Union and College of Agriculture in Rosario La Union.</p> <p>The technologies to be included for adoption are goat farming systems and chevon products processing, seaweed farming systems and value added products, mango and banana farming systems and processing that were previously funded by DOSTPCAARRD.</p> <p>Technologies generated thru the university funds will also be included such as honey, honey vinegar, and yam powder.</p> <p>The project team will screen all participants based on the established criteria. Trainings will also be conducted to identify potential incubatees. They will undergo series of trainings on farming and value-adding. The project will consist of three phases, namely: the pre-incubation phase, incubation phase, and post incubation phase.</p> <p>Of the technologies generated thru PCAARRD funding, none are being commercialized at present. Hence, there is a need for the University to establish mechanisms such that the technologies are adopted and utilized by potential entrepreneurs as start-up business. Thus, the establishment of DOST PCAARRD-DMMMSU TBI facility in the University shall provide services for the training of potential entrepreneurs, facilitate the establishment of technologybased enterprises, and eventually help create jobs for the community.</p>	<p>Products 4 Curricula</p> <p>40 Modules</p> <p>People and Services 10 Pre-Commercialization Services</p> <p>Provided</p> <p>5 Incubatees</p> <p>accepted/trained/mentored</p> <p>15 faculty/staff experts in training and mentoring</p> <p>Places and Partnerships 1 TBI facility established</p> <p>2 Farming Communities</p> <p>5 MOAs executed</p> <p>2 Funding institutions</p> <p>4 National Agency Partners</p> <p>2 Private Sector Partners</p> <p>Policies 3 Business plans</p> <p>1 Operational manual</p> <p>3 TBI curricula</p> <p>1 Techno-preneurship Manual</p> <p>Publications 3 Business plans</p> <p>1 Operational manual</p> <p>3 TBI curricula</p> <p>1 Techno-preneurship Manual</p>	DMMMSU	<p>Incubatees such as:</p> <p>a. Private individuals</p> <p>b. Goat Farmers and processors</p> <p>c. Seaweed Farmers and processors</p> <p>d. Mango farmers and processors</p> <p>e. Banana Farmers and Processors</p> <p>f. Farmers and fishermen cooperative, and</p> <p>g. Peoples organizations (POs)</p> <p>h. Technology generators from DMMMSU</p>	16-Aug-18	15-Aug-20	ONGOING	7,798,712.00	1,935,369.00

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status 'As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
DOST-PCAARRD Technology Business Incubation (TBI) Program Batch 2	Project 5. DOST-PCAARRD-FPRDI Technology Business Incubator for Wood and Non-wood Processing Technologies	KRA 3: Rapid, Inclusive and Sustained Economic Growth	FPRDI's technology transfer and commercialization activities started in the 80's with the first successful adoption of the Furnace Type Lumber Dryer (FTLD) which, until the present enjoys continued adoption. The commercialization of other FPRDI technologies - spray booth, charcoal briquetting, wood wool cement boards, etc. - soon followed within that decade. However, not all resulted in sustained adoption. The successful adoption of a technology depends not only on whether it answers the needs of the adopter and the market but also on other equally important logistical and managerial inputs required in running a business. MSMEs in particular often lack these and their adoption of a superior technology alone does not ensure business success. One technology transfer mechanism to address this is through a Technology Business Incubator (TBI). A TBI is a facility "where start-ups are hosted and business development services are provided." TBIs offer office space as well as technical services and facilities to help start-ups get their businesses established. The technologies to be prioritized for incubation and commercialization under the TBI includes the resin refining technology, production of pyroligneous liquid from bamboo, production of bamboo veneer, and wine barrel production from local wood species. A TBI attached to FPRDI's commercialization program can help MSMEs struggling to take off by providing temporary office space, factory facilities and various services at lower cost. Access to technical and marketing support will also be within their reach, thus	Publication - 1 TBI Operations Manual printed/published - 1 List of technologies for potential adoption - 1 list of TBI service offerings published - 1 TBI Business Plan enhanced - 1 curriculum published - 3 IEC materials developed - IEC materials disseminated to 150 individuals - At least 1 Business Plan developed for an incubate - 3 IEC materials reviewed and revised - IEC materials disseminated to 150 individuals Places & Partnerships - 1 TBI office/facility enhanced - 3 FPRDI personnel involved in providing services - At least 2 consultants	FPRDI	Start-up MSMEs in the wood and non-wood processing industry	16-Aug-18	15-Aug-20	ONGOING	5,827,544.58	665,646.20
DOST-PCAARRD Technology Business Incubation (TBI) Program Batch 2	Project 6. DOST-PCAARRD-LSPU Technology Business Incubation Hub for Agri-Fishery and Natural Products	KRA 3: Rapid, Inclusive and Sustained Economic Growth	This proposed project involves the establishment of a TBI hub in the LSPU Siniloan Campus with the aim of promoting potential agri- and fishery-based products towards sustainable commercialization. The TBI will primarily aid the promotion of certain agri-fishery products such as natural oil extracts and synbiotic-enriched aqua feeds. This TBI hub initiative will also provide rural partner micro-entrepreneurs with a portfolio of venture support infrastructure, including: business services, networking, access to professional services and university resources. The intent is to help start-ups by enabling linkages to help the new businesses survive, scale up, and grow.	Commercially competitive: Agri-based product /Natural oil product Aqua-based product Incubatees Accepted as Start-Up Incubatees Trained/Mentored Incubatees Graduated Faculty Involved Trained/Mentored Private Sector Trained/Mentored Pre-commercialization Services Offered TBI Facility Hub RDIs Involved in TBI Private Sector Partners National Gov. Agency Partners Funding Institution Partners MOAs Executed TBI Operations Manual TBI Curriculum TBI Business Plan Technopreneurship /manual/guidelines Patents/UMs/Trademarks Filed Patents/UMs/Trademarks Approved Licensed Technologies Operational and Procedural Framework	LSPU	Disadvantaged rural inhabitants (farmers, fisherfolks), microentrepreneurs, food processors in the province of Laguna, techdevelopers and industry researchers, students and graduates through employment/OJT opportunities, faculty through the TBI as "living Laboratory" Direct Beneficiaries: 3-4 potential business incubatees (SMVA, SKEA, Yula's chicharon, Mushroom Growers Association) 10 faculty trained/mentored; More student-entrepreneurs who will be doing the On-the-Job Training like: Senior High School students, Business Administration students and BS Agribusiness students in the Siniloan campus and nearby colleges in the province of Laguna.	16-Aug-18	15-Aug-20	ONGOING	6,737,558.40	1,735,137.60
DOST-PCAARRD Technology Business Incubation (TBI) Program Batch 2	Project 7. DOST-PCAARRD-SKSU Agri-Aqua Technology Business Incubator	KRA 3: Rapid, Inclusive and Sustained Economic Growth	The SKSU Agri-Aqua Technology Business Incubator will be the center for technology transfer and business incubation in the University. It will provide technical services to the incubatees for the promotion and commercialization of the developed technologies. The project will focus on the halal goat production, mushroom production, and processing of fishery products. The first 2 quarters will focus on the making of operations manual, curriculum and business plan. It will be followed by the establishment of partnerships and linkages among technology incubator clients, technical experts, market and funding sources for the sustainability of the project's operations. The capability building and enhancing training will be conducted during the late quarter of the first year to train the target incubatees. Refurbishment of the mushroom laboratory will be done to facilitate the conduct of training for incubatees. Developed products and TBI services will be promoted through print and broadcast media and conduct seminar-orientation. This will also facilitate the marketing of said products, services and establish partnership with potential financing institutions among others.	At least 10 incubatees for business incubators extensively trained by technical experts At least 5 faculty/technical experts involved in the capacity building At least 3 Private Sector Involved in Training & Mentoring At least 6 Trainings Conducted At least 2 Promotional Activities conducted At least 2 TBI Personnel Trained 2 Networking activities conducted/participated At least 1 Technopreneurship Manual At least 2 IEC Materials developed At least 1 Technology Guide/ Operations Manual developed A least 1 Curricula developed At least 1 business plan developed At least 1 Technology Guide/ Operations Manual copyrighted A least 1 Curricula copyrighted At least 1 business plant copyrighted 1 echnopreneurship manual copyrighted 1 Technology Business Incubator established 1 Mushroom Laboratory enhanced At least 2 partnership agreement with private sector/private individual At least 2 MOU with technical experts At least 10 MOAs with incubatees 1 TBI Operational Guidelines developed At least 1 TBI Curriculum developed 1 TBI Business Plan developed	SKSU	Meat processors, meatshops, goat raisers, Agrarian Reform Beneficiaries' Organization, BAT graduates, Fishermen's Housewives Association	16-Aug-18	15-Aug-20	ONGOING	6,541,040.00	1,796,223.60

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
DOST-PCAARRD Technology Business Incubation (TBI) Program Batch 2	Project 8. DOST-PCAARRD-WMSU Agriculture and Food Technology Business Incubator	KRA 3: Rapid, Inclusive and Sustained Economic Growth	<p>The WMSU-TBI unit is under the jurisdiction of the Research Development and Evaluation Center. Its main office is at the 2nd floor of the Research Building of Western Mindanao State University. It is aimed to provide services that promote technology transfer and commercialization.</p> <p>The creation of WMSU Technology Business Incubation Unit (WMSU-TBIU) was approved during the 178th of the WMSU Board of Regents meeting on December 11, 2017. It is in support to the University's mission to deliver quality research and technology commercialization (WMSU-BOR, 2017).</p> <p>The goal of the TBIU is to help researchers, students, and agri-business sectors to commercialize the generated agriculture and food technologies. In return, it generates more jobs and eventually it paves way for the regional and national development.</p> <p>With its core functions, TBIU plays a significant role to identify and assess technologies with commercial viability. In the process, it provides opportunities for developing strong partnerships, linkages and collaboration between the universities and industries.</p> <p>Currently, WMSU has several technologies needed to be commercialized. They are native chicken technology (Zampen native chicken live and dressed), oyster mushroom production and processing (fresh</p>	<p>People and Services</p> <ul style="list-style-type: none"> <li>i. No. of incubatees recruited</li> <li>i. No. of TBI personnel trained</li> <li>i. No. of incubatees trained</li> <li>i. No. of trainings conducted for TBI personnel</li> <li>i. No. of trainings conducted for incubates</li> <li>i. No. of networking activities</li> <li>i. No. of benchmarking activity conducted</li> </ul> <p>Publications</p> <ul style="list-style-type: none"> <li>i. No. of IEC materials developed (Native Chicken, Vermicast, Oyster Mushroom, and Organic Vegetables)</li> </ul> <p>Patents</p> <ul style="list-style-type: none"> <li>i. No. of copyright</li> </ul> <p>Places and Partnerships</p> <ul style="list-style-type: none"> <li>i. No. of partnerships established</li> <li>i. No. of pool of experts established</li> <li>i. No. of Agriculture and Food TBI Hub</li> </ul> <p>Policies</p> <ul style="list-style-type: none"> <li>i. No. of Operational Guidelines Prepared</li> <li>i. No. of TBI Curriculum Developed</li> <li>i. No. of TBI Business Plan Prepared</li> <li>i. No. of WMSU Board Resolution</li> </ul> <p>Products</p> <ul style="list-style-type: none"> <li>i. No. of database system developed</li> </ul>	WMSU	The target beneficiaries are the start-up and spin-off companies, farmers and inventors/generators of agriculture and food technology, university graduates	16-Aug-18	15-Aug-20	ONGOING	4,546,531.56	1,743,241.12
DOST-PCAARRD Technology Business Incubation (TBI) Program Batch 2	Project 9. DOST-PCAARRD-WPU Agriculture and Fisheries Technology Business Incubator	KRA 3: Rapid, Inclusive and Sustained Economic Growth	<p>The goal is to establish the Western Philippines University-Technology Business Incubator (WPU-TBI) office in Puerto Princesa City Camus where other government and private agencies that could be collaborators of future partners are at most accessible. The WPU-TBI will be at the center for technology transfer and business incubation of technologies generated in the university. Specifically, it will provide technical services to incubatees for commercialization of mature technologies in the production of agriculture and aquatic species and products.</p> <p>The technologies to be prioritized for incubation and commercialization under the TBI includes the long-line culture of green mussel, development of green mussel-based food products, multiple longline seaweed farming, and development of seaweed-based food products.</p>	<p>Products: 10 incubatees</p> <p>People and Services:</p> <ul style="list-style-type: none"> <li>- At least 1 TBI personnel extensively trained under Technology Commercialization Mentorship Series</li> <li>- At least 10 faculty-researchers involved in training and mentoring mentored by the TBI personnel</li> <li>- At least 4 representatives from the private sector and/or funding institutions participated in the training and mentoring mentored by the TBI personnel</li> </ul> <p>Publications:</p> <ul style="list-style-type: none"> <li>- At least 1 TBI Business plan</li> <li>- 1 operations manual</li> <li>- 1 TBI curriculum</li> <li>- 1 Monitoring and Evaluation plan</li> <li>- 1 Sustainability plan</li> <li>- At least 1 promotional IEC for WPU Technologies</li> <li>- At least 2 trademarks files</li> <li>- At least 2 Patent applications filed</li> </ul> <p>Places and Partnerships</p> <ul style="list-style-type: none"> <li>- 1 WPU TBI established and institutionalized</li> <li>- 1 letter of commitment from WPU</li> <li>- 1 Memoranda of Agreement signed</li> <li>- At least 1 partnership agreement with Business Groups/Marketing/Trade/Financing Institutions</li> </ul> <p>Policies:</p> <ul style="list-style-type: none"> <li>- 1 Institutional TBI policies reviewed/crafted</li> <li>- 1 Technology Transfer Protocols reviewed/crafted</li> </ul>	WPU	Technology and Business Development Office of WPU Technology Business Incubator personnel and manager WPU Researchers/Inventors Technology adapters	16-Aug-18	15-Aug-20	ONGOING	6,609,094.40	4,307,834.00



Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
Enhancing Livelihood Opportunities in Conflict-Vulnerable Areas in Mindanao through the LIFE (Livelihood Improvement through Facilitated Extension) Model	Project 1. Scaling Out the LIFE Model to Improve the Productivity of Select Upland Farmers Group in Surallah, South Cotabato	KRA 3: Rapid, Inclusive and Sustained Economic Growth	<p>The Livelihood Improvement through Facilitated Extension (LIFE) Model is a result of the ACIAR Mindanao Agricultural Extension Project (AMAEP) which started in 2013. The model has been developed and implemented in selected conflict-vulnerable areas in Mindanao, namely, Ampatuan in Maguindanao, Koronadal in South Cotabato, and Ipil in Zamboanga Sibugay. This project was made possible by funding from the Australian Center for International Agricultural Research (ACIAR).</p> <p>The project benefited from the years of experience gained from previous projects in non-conflict areas of Mindanao and the Visayas involving the Landcare Foundation of the Philippines, Inc. (LFPI) and other partners. A review of proven extension approaches from these projects covering the period from 1999 to 2011 resulted in the development of 16 principles that formed the basis of the initial implementation in the three pilot sites of the AMAEP, namely Barangay Assumption of Koronadal, Barangay Kauran of Ampatuan, and Barangay Magdaup of Ipil.</p> <p>The 16 principles are implemented under three strategies: 1. Improving farmer access to technical innovations; 2. Building community social capital; 3. Collaborating closely with local institutional (extension and technical) partner agencies.</p>	<p>Places and Partnerships: MOA/MOU with Brgy Canahay, Surallah to implement the LIFE model, Expanded networks of farmer Brgy Canahay cooperators</p> <p>People and Services: Conducted capacity building/mentoring for new facilitators; Organized at least 30 farmer cooperators into one cluster; Conducted at least one cross visit and one other capacity building activity for cooperators; Improved access of farmer groups to government programs thru Barangay, Municipal/City LGU as well as agencies such as PCA, DA, DTI and DOST; Established at least one learning area; Registered the farmer cooperators group with DOLE; Conducted at least 2-3 other capacity building activities for cooperators; One Field Day</p> <p>Products: Increased farmers' income by 30% (based on results of the baseline data)</p> <p>Policies: Initiated stakeholders' consultation with cooperators for policy development, Ordinance or Resolution passed in the local government unit</p> <p>Publication: One video material for experience of implementing the LIFE Model , At least 2 papers published that are peer reviewed; Training module published; Terminal report</p>	UPMin	The target beneficiaries of the project include extension service providers, local government units, farmer partners, policy makers and even the R&D community.	16-Dec-17	15-Dec-20	ONGOING	7,449,037.00	2,251,033.51
Enhancing Livelihood Opportunities in Conflict-Vulnerable Areas in Mindanao through the LIFE (Livelihood Improvement through Facilitated Extension) Model	Project 2. Scaling Out the LIFE Model to Improve the Productivity of Select Lowland Farmers Group in Datu Abdullah, Sangki, Maguindanao	KRA 3: Rapid, Inclusive and Sustained Economic Growth	<p>The Livelihood Improvement through Facilitated Extension (LIFE) Model is a result of the ACIAR Mindanao Agricultural Extension Project (AMAEP) which started in 2013. The model has been developed and implemented in selected conflict-vulnerable areas in Mindanao, namely, Ampatuan in Maguindanao, Koronadal in South Cotabato, and Ipil in Zamboanga Sibugay. This project was made possible by funding from the Australian Center for International Agricultural Research (ACIAR).</p> <p>The project benefited from the years of experience gained from previous projects in non-conflict areas of Mindanao and the Visayas involving the Landcare Foundation of the Philippines, Inc. (LFPI) and other partners. A review of proven extension approaches from these projects covering the period from 1999 to 2011 resulted in the development of 16 principles that formed the basis of the initial implementation in the three pilot sites of the AMAEP, namely Barangay Assumption of Koronadal, Barangay Kauran of Ampatuan, and Barangay Magdaup of Ipil.</p> <p>The 16 principles are implemented under three strategies: 1. Improving farmer access to technical innovations; 2. Building community social capital; 3. Collaborating closely with local institutional (extension and technical) partner agencies.</p>	<p>Places and Partnerships: MOA/MOU with one barangay of DAS, Maguindanao to implement the LIFE model; Expanded network of farmer cooperators of Barangay of DAS, Maguindanao cooperators and at least one other govt agency</p> <p>People and Services: Conducted capacity building/mentoring for new facilitators; Organized at least 30 farmer cooperators into one cluster; Conducted at least one cross visit and one other capacity building activity for cooperators; Improved access of farmer groups to government programs thru Barangay, Municipal/City LGU as well as agencies such as PCA, DA, DTI and DOST; Initiated to establish at least one demo farm; Conducted at least 2-3 other capacity building activities for cooperators; Registered/Enhanced the farmer cooperators group with DOLE; Conducted at least 23 other capacity building activities for cooperators; Established at least one demo farm; One Field Day</p> <p>Products: Increased farmers' income by 20%, Increased farmers' income by 30% (based on results of the baseline data)</p> <p>Policies: Initiated stakeholders' consultation with cooperators for policy development</p> <p>Publication: One video material for experience of implementing the model; At least 2 papers published that are peer reviewed and ISI; Training module published; Terminal report</p>	UPMin	The target beneficiaries of the project include extension service providers, local government units, farmer partners, policy makers and even the R&D community.	16-Dec-17	15-Dec-20	ONGOING	7,270,702.00	2,508,882.79

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Enhancing Livelihood Opportunities in Conflict-Vulnerable Areas in Mindanao through the LIFE (Livelihood Improvement through Facilitated Extension) Model	Project 3. Scaling Out the LIFE Model to Improve the Productivity of Select Coastal Community Group in Ipil, Zamboanga Sibugay	KRA 3: Rapid, Inclusive and Sustained Economic Growth	<p>The Livelihood Improvement through Facilitated Extension (LIFE) Model is a result of the ACIAR Mindanao Agricultural Extension Project (AMAEP) which started in 2013. The model has been developed and implemented in selected conflict-vulnerable areas in Mindanao, namely, Ampatuan in Maguindanao, Koronadal in South Cotabato, and Ipil in Zamboanga Sibugay. This project was made possible by funding from the Australian Center for International Agricultural Research (ACIAR).</p> <p>The project benefited from the years of experience gained from previous projects in non-conflict areas of Mindanao and the Visayas involving the Landcare Foundation of the Philippines, Inc. (LFPI) and other partners. A review of proven extension approaches from these projects covering the period from 1999 to 2011 resulted in the development of 16 principles that formed the basis of the initial implementation in the three pilot sites of the AMAEP, namely Barangay Assumption of Koronadal, Barangay Kauran of Ampatuan, and Barangay Magdaup of Ipil.</p> <p>The 16 principles are implemented under three strategies:</p> <ol style="list-style-type: none"> <li>1. Improving farmer access to technical innovations;</li> <li>2. Building community social capital;</li> <li>3. Collaborating closely with local institutional (extension and technical) partner agencies.</li> </ol>	<p>Places and Partnerships: MOA/MOU with Ipil, Zamboanga Sibugay to implement the LIFE model, Expanded networks of farmer cooperators of Ipil, Zamboanga Sibugay</p> <p>People and Services: Conducted capacity building/mentoring for new facilitators; Organized at least 30 farmer cooperators into one cluster/association; Conducted at least one cross visit and one other capacity building activity for cooperators; Improved access of farmer groups to government programs thru Barangay, Municipal/City LGU as well as agencies such as BFAR, PCA, DA, DTI and DOST; Established at least one learning area; Registered the farmer cooperators group with DOLE; Conducted at least 2-3 other capacity building activities for cooperators; One Field Day</p> <p>Products: Increased farmersâ€™ income by 30% (based on results of the baseline data)</p> <p>Policies: Initiated stakeholdersâ€™ consultation with cooperators for policy development , Ordinance or Resolution passed in the local government unit</p> <p>Publication: One video material for experience of implementing the LIFE Model; At least 2 papers published that are peer reviewed; Training module published; Terminal report</p>	UPMin	The target beneficiaries of the project include extension service providers, local government units, farmer partners, policy makers and even the R&D community.	16-Dec-17	15-Dec-20	ONGOING	7,008,952.00	2,252,855.97
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 (PinACA-SciCAT) (Old Title: Science and Technology-based Tourism for Agri-Aqua & Natural Resources (STAR))	KRA 3: Rapid, Inclusive and Sustained Economic Growth	<p>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:</p> <ol style="list-style-type: none"> <li>1. Profiling â€” Determine baseline data, current condition/status of multi sectors that may affect the proposed site.</li> <li>2. Feasibility Study â€” Determine products, organization, business model, POT, etc. that will yield the best profit margin and most sustainable.</li> <li>3. Business Planning â€” Determine strategies for establishing the SciCAT Farm and how to transform known risks and weaknesses into opportunities.</li> <li>4. Mentorship Program â€” MS / beneficiaries will be guided and coached from starting the SciCAT Farm to operation and sustainability.</li> <li>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 expertsâ€™ knowledge/advise.</li> </ol>	<ol style="list-style-type: none"> <li>1. Established 7 SciCAT sites in the following areas: <ol style="list-style-type: none"> <li>1.1 La Trinidad, Benguet</li> <li>1.2 Sto. Tomas, La Union</li> <li>1.3 Los Banos, Laguna</li> <li>1.4 Indang, Cavite</li> <li>1.5 Bilar, Bohol</li> <li>1.6 Banay-banay, Davao Oriental</li> <li>1.7 Malaybalay City, Bukidnon</li> </ol> </li> <li>2. 6 MS and 1 institutional farm Trained and Mentored;</li> <li>3. Align 7 SciCAT sites to the DOT initial accreditation requirements;</li> <li>4. Demonstrated optimal farm productivity and profitability in each SciCAT site;</li> <li>5. SciCAT owner established linkages with co-farmers, marketing associations, students, government institutions, among others;</li> <li>6. Developed 7 Profiling Reports, Feasibility Studies, Farm Enterprise plan, and Layout &amp; Design plan;</li> <li>7. Developed 12 Mentoring Reports for the whole duration of the program;</li> </ol>	UPD	MSF community of chosen sites	1-Aug-18	31-Jul-21	ONGOING	17,230,253.40	2,320,527.06

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Establishment of DOST-PCAARRD Science for the Convergence of Agriculture and Tourism (SciCAT)	Project 2. Transforming Silan's Farm in Indang, Cavite into Science for the Convergence of Agriculture and Tourism (SciCAT) - Batch 1 (Old Title: Transforming Silan Farm in Indang, Cavite into a Science and Technology-based (S&T-Based) Agri-tourism Site)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Filipino farmers remain to be the poorest among the basic sectors in the Philippines based on its poverty incidence value of 34.3% in the report by Philippine Statistics Authority (PSA) in 2015. One of the interventions done by the government to address this issue is the creation of the Republic Act No. 10816, also known as the "Farm Tourism Development Act (FTDA) of 2016" which provides a comprehensive program for the development and promotion of farm tourism in the Philippines. Farm tourism in the country will serve as a viable means to diversify income of farmers. It will also serve as a venue for information sharing and technology transfer for capacitating farmers and for orienting tourists of the importance of agriculture. More than just enhancing the country's potential as an agricultural nation, agri-tourism is proven to be of aid in the economic growth of a community providing vast employment opportunities along with its social benefits as an educational training area and an effective mechanism towards ecological conservation. This project is anchored on United Nations Sustainable Development Goal on Sustainable Cities and Communities and on Industry, Innovation and Infrastructure promotes participatory, integrated and sustainable development projects that can solve economic and environmental challenges through investments in scientific research and innovation. This is also anchored on the socio-economic agenda of President Rodrigo Duterte which involve promotion of rural tourism and the use of science and technology in the development of such communities. The support of the local government unit of Indang is also	Publications 1 customer satisfaction survey report 1 journal article Patent/IP 3 copyrighted IEC materials 1 trademark Products 2 promotional videos At least 10 IEC materials At least 2 POTs downloaded People & Services 5 capability and skills training for 200 beneficiaries 50 technology adopters Places & Partnerships 1 learning/recreational site 1 farm tourism site 1 MOA for project sustainability Policies 1 municipal ordinance recognizing the SciCAT site as municipal tourist destination	CvSU	i. Magsasaka Siyentista and workers i. Farmer cooperatives/organizations i. Farming communities in Indang, Cavite i. Entrepreneurs i. LGUs i. Visitors who want to escape urban/city life and want to experience actual farm activities while appreciating the value of farm produce	1-Aug-18	31-Jul-20	ONGOING	4,703,278.40	996,898.00
Establishment of DOST-PCAARRD Science for the Convergence of Agriculture and Tourism (SciCAT)	Project 3. The Making into a SciCAT of the Seeds and Seedling (S&S) Plaza - Batch 1 (Old Title: The Making into a STAR of the Seeds and Seedlings (S&S) Plaza)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	In support to agri-tourism, BPI-LBNCRDPSC proposed and established the S&S Plaza which is strategically situated at the back of DOST-PCAARRD Technology Innovation Center (DPITC) building. The plaza generally aims to promote different technologies on planting material preparation as showcased in different edible landscape designs. Since its launching on June 28, 2017, it has already accommodated a total of 930 visitors and has provided lectures on seedling establishment and management to 337 individuals. It also catered to the needs of various individuals for planting materials of herbs and ornamental plants. A total of 540 planting materials of herbs and ornamentals were sold while 692 assorted herbs and 330 assorted varieties of mayana were distributed to different clienteles and beneficiaries. The plaza have accomplished significantly and have served its purpose, however, more can still be achieved. It has high potential to exhibit the objectives of a Science and Technology-based Convergence of Agriculture and Tourism (SciCAT) farm. Hence this proposal.	1. Documentation of the entire realignment and or transformation phase (including experiences, best practices and lessons learned) of the S&S Plaza into a SciCAT; 2. Provided information to UP ISSI in the preparation of the farm profile of the S&S Plaza 3. Participated in the preparation of the Feasibility Study (FS) and Business Plan (BP) of UP ISSI for the S&S Plaza 4. Established showcase of selected POTs at the S&S Plaza 5. IEC materials (10 Flyers/brochures/ Videos 6. Demonstrated optimal farm productivity and profitability at the S&S Plaza 7. Established linkages with other government and private institutions, agritourism farms, marketing associations, farmers, entrepreneurs, students, among others. 8. Trained 350 farmers and farming enthusiasts 9. Identified 20 potential and 4 actual adopters 10. Established linkages and networks of potential SciCAT sites in terms of production, postharvest and marketing activities 11. Increased visibility and market awareness of the S & S Plaza 12. Initial DOT accreditation of the S&S Plaza	BPI-LBNCRDC	Farmers, farm entrepreneurs, private and government agencies/organizations, SUCs, students, farming enthusiast and the like	1-Aug-18	31-Jul-20	ONGOING	6,683,085.60	1,570,812.00

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
Establishment of DOST-PCAARRD Science for the Convergence of Agriculture and Tourism (SciCAT)	Project 4. Mt. Kitanglad Agro Eco-Tourism Farm, Science for the Convergence of Agriculture and Tourism (SciCAT) Project of Bukidnon, Region 10 - Batch 1 (Old Title: Mt. Kitanglad Agri Eco-tourism Farm, a Science and Technology-based Tourism for Agri-Aqua and Natural Resources (STAR) Project of Bukidnon, Northern Mindanao)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Mt. Kitanglad Agri Eco Farm is a DA-ATI 10 Learning Site and School of Practical Agriculture, hence the possibility of turning into a farm tourism accredited by DOT through the intervention of the SciCAT extension â€” research results utilization modality of PCAARRD â€” DOST is of great potential. Section 12 of RA 10816 specifically give mandate to the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARD), one of the councils of the DOST, to include the technology needs, in the context of innovation, of farm tourism sites in its research and development programs. Particularly at M.K.A.E. it will be enhanced in its capability to produce chemical free high value crop vegetables being one of its niche offering in providing meal package to tourists and visitors. This is through providing package of technologies (POT) in chemical free cabbage and sweet pepper among other high value vegetable produce in the farm such as lettuce in combination with various kinds of mints. Realizing the potential of developing a science-based tourism farm sites that will feature common farm tourism activities such as farm tours, training, farm exhibits, pick-and pay, hands-on activities for tourists (i.e. actual planting, harvesting, processing, etc.) while also promoting mature technologies developed through DOST PCAARRD various Research and Development Institutes (RDIs) and State Universities and Colleges (SUCs), PCAARRD will now engage in developing farm tourism sites of the MS. This farm site will be known as Science and Technology-based Convergence of Agriculture and Tourism (SciCAT) Farm sites. SciCAT is a technological convergence to improve productivity and capacity for sustainable farming practices while showcasing its beauty and attraction in	1 MS trained At least 50 farmers/farming enthusiasts trained At least 10 additional employment opportunities At least 2 Laboratory services facilitated for citronella oil products At least 1 copyrighted IEC materials 1 Trademark (logo, signage, etc.) At least 2 POTs downloaded At least 3 abaca based handicrafts At least 3 indigenous HandLooms modified 4 progress reports 1 terminal report 1 set of IEC materials At least 1 social media site 3 Progress Report 1 Terminal report	DOST X	Mt. Kitanglad Agri-Eco Farm (MS Benjamin Maputi), IP Women RIC of Imbayao, Malaybalay City, Out of School Youth and High Value Crop Farmers within the Mt. Kitanglad Natural Range Natura Park.	1-Aug-18	31-Jul-20	ONGOING	4,704,422.40	789,850.00
Establishment of DOST-PCAARRD Science for the Convergence of Agriculture and Tourism (SciCAT)	Project 5. A SciCAT of ORGANIC CHAMPION: A Science for the Convergence of Agriculture and Tourism (SciCAT) for Organic Farming of a Champion Family in Banay-banay, Davao Oriental - Batch 1 (Old Title: A STAR for ORGANIC CHAMPION: A Science and Technology-based Tourism for Agri-Aqua and Natural Resources (STAR) for Organic Farming of a Champion Family in Davao Oriental)	KRA 3: Rapid, Inclusive and Sustained Economic Growth	Republic Act No. 10816, also known as the Farm Tourism Development Act (FTDA) of 2016, provides a comprehensive program for the development and promotion of farm tourism in the Philippines to maximize the benefits that can be derived from agriculture and tourism combined. The combination of these two major sectors can effectively elevate awareness of the importance of agriculture, promote environment-friendly and sustainable farm practices, and generate more job opportunities in the agriculture and fishery communities. In line with this, the Department of Tourism (DOT) has launched its Farm Tourism Program, with tagline: "It's More Fun in Philippine Farms", to introduce new adventure to both domestic and international visitors that can be branded as "Made in the Philippines". The program is led by an interim Farm Tourism Development Board composed of the DOT, the Department of Agriculture (DA), the Department of Trade and Industry (DTI) and other stakeholders. The DOT and the DA disseminate and enforce the standards and guidelines on the accreditation of farm tourism sites. As of September 2017, there are 35 farm tourism sites accredited by the DOT across the country. The first farm tourism destination in the country is the Costales Nature Farm in Majavjay, Laguna which is being visited by more than 3,000 local and foreign tourists every month to learn and have a hands-on experience on how organic farming is done, to check the place for possible investment opportunities, or to spend special occasions in the farm.	â€¢ 1 MS trained/mentored â€¢ At least 100 trained farmers â€¢ At least 100 farm visitors per month â€¢ At least 20 identified potential POT Adopters and 4 actual adopters â€¢ At least 3 Copyrighted IEC Materials â€¢ At least 1 Trademark (logo or signage) â€¢ At least 3 POT Implemented  â€¢ At least 4 IEC Materials â€¢ At least 10 Promotional campaign and materials â€¢ At least 1 FB page â€¢ 6 quarterly reports â€¢ At least 3 MOA signed â€¢ 1 SciCAT site i. At least 1 Municipal ordinances supporting SciCAT sites as Farm Tourism sites	USEP	Magsasaka Siyentista (MS) Naomi Dimpas, PLGU/LGU, Local Community/Farmers, Students and Tourists	1-Aug-18	31-Jul-20	ONGOING	4,702,755.20	564,024.00

Program Title	Project Title	Key Result Areas (KRA)	Description of Program/Project/Objectives	Expected Output/Target	Implementing Agency	Beneficiaries	Start	End	Status *As of December 31, 2019	Total Project Cost	2019 PCAARRD GIA
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 Sientista (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	To transform MSFs into SciCAT Farm Enterprises that will serve as the community's main tourist farm attraction leading to the creation of employment and entrepreneurship opportunities in the community.	01. 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;	BSU	MSF community of chosen sites	1-Oct-19	30-Sep-21	NEW	4,705,622.40	639,382.80
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	To transform MSFs into SciCAT Farm Enterprises that will serve as the community's main tourist farm attraction leading to the creation of employment and entrepreneurship opportunities in the community.	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;	DMMMSU	MSF community of chosen sites	1-Oct-19	30-Sep-21	NEW	3,695,067.60	300,938.80
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, Bilal, 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	To transform MSFs into SciCAT Farm Enterprises that will serve as the community's main tourist farm attraction leading to the creation of employment and entrepreneurship opportunities in the community.	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 Bilal, 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;	BISU	MSF community of chosen sites	1-Oct-19	30-Sep-21	NEW	3,669,166.80	170,245.60