

FY 2024 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, 2024 | Total Project Cost | 2024 PCAARRD GIA |
|---------------|---|---|--|--|---|---|-----------|-----------|---------------------------------|--------------------|------------------|
|               | ADAPTABILITY TRIAL AND PERFORMANCE EVALUATION OF PROMISING SUGARCANE HYBRIDS IN DIFFERENT AGRO-ECOLOGICAL GROWING CONDITIONS OF THE PHILIPPINES   | Integrity of the environment and climate change adaptation and mitigation | The development of sugarcane hybrid/crosses that are resilient to climate change is very important to address the problem being experienced by the sugarcane growers in the country (e.g. drought stress, water logging, pests and diseases). Drought stress is reported to significantly affect the growth of sugarcane and can reduce production by up to 70%. In the University of the Philippines at Los Baños, (UPLB) Laguna, Philippines, varied improved program to develop high yielding and climate resilient sugarcane varieties started since 2008. The breeding program produced crosses between proven parents and donor parents and promising hybrid/crosses were selected. Subsequent hybridization and evaluation from 2017 to 2020, have produced and selected 64 promising sugarcane hybrid/crosses with high productivity and sugar yields higher than the check varieties. These promising hybrid/crosses should be tested in different locations across the sugarcane growing areas in the country. The multi-location trials across different environments will enable the breeder to select promising hybrid/crosses that are stable, high yielding and resistant to different stresses.  | Publication: At least 1 full paper in ISI Journal<br>At least 2 posters in scientific conference<br>Patent: sugarcane variety for NSIC registration/Product: promising sugarcane varieties/People: students to be included in the program to be involved in selection/Place: University of Southern Mindanao, Kabanagan, Sugar Regulatory Administration (SRA), La Gracia (SRA LaGracia/REC/Policy: none   | University of the Philippines Los Baños (UPLB)  | sugarcane farmers researchers, other interested users   | 01-Jul-23 | 30-Jun-26 | ONGOING                         | 20,358,482         | 3,411,725.21     |
|               | Assessment and management of plant essential heavy metals (PEHM), nutrients and pathogens in vegetable production to enhance soil health and food safety in the Philippines (Managing heavy metals and soil contaminants in vegetable production to ensure food safety and environmental health in the Philippines) | Integrity of the environment and climate change adaptation and mitigation | The vegetable production systems in the country are intensively managed and are prone to a series of biophysical constraints that greatly impact productivity and sustainability. The previous ACIAR project on vegetable production (SMC/N2012/029) has identified major gaps in our understanding of the short- and long-term impacts of crop management practices on soil fertility and off-site environmental impacts. Specifically, these included undiagnosed micronutrient deficiencies, excessive soil accumulation of Cu and Zn, and excessive application of fertilizer and manures. Rates of fertilizer application were greatly in excess of crop demand and the seasonal application of Cu and Zn through fungicides was found to be in the order of 20-30 times crop demand. The substantial knowledge gap on the impact of PEHM (particularly Cu and Zn) and other undiagnosed nutrient limitations needs to be evaluated. The unbalanced and excessive application of PEHM and fertilizer combined with poor soil management strategies will have long-term deleterious environmental and productivity impacts on Philippine vegetable production if it is not properly addressed. New strategies and options are required to address key issues in vegetable production including optimized nutrient inputs, more effective management of soil and fertilizer programs and reduce PEHM inputs and accumulation over time. This necessitates the identification of alternative options that maintain soil fertility and health, offset inputs of Cu and Zn, and maximize crop productivity and to develop appropriate decision support tools to achieve this. The project will focus on understanding the impact of excessive PEHM on the productivity of both upland (cabbage and sweet pepper) and lowland vegetables (tomato and eggplant), develop strategies for reducing the inputs of PEHM, resolve unidentified micronutrient limitations and develop cropping strategies to maintain fertility and soil biology while reducing PEHM inputs. The findings of the project can be used to draft policy recommendations on soil, crop and pasture management for implementation by the LGUs and government agencies such as BRWM and BWS. | Publication: Minimum of 1 Scope or ISI-indexed publication paper publication; IEC materials like press releases, information bulletins, instructional or training materials and modules<br>Patent: None/Product: Databases and management protocols<br>Database on soil properties, levels of nutrients and PEHM, pests and disease incidence in major vegetable growing regions in the Philippines<br>Proper nutrient and pesticide recommendations to mitigate impact of excessive PEHM and nutrient deficiencies/toxicities on vegetable production<br>Soil, crop, pest and disease management to mitigate PEHM accumulation, ensure food safety and environmental health<br>People: Trained personnel through workshop/trainings for the protocols on management practices in heavy metal-contaminated soils.<br>Minimum of 1 training workshop to be conducted.<br>Minimum of 4 undergraduate/graduate students to conduct their thesis studies under the program.<br>Place: Partner institutions, SUCs, LGUs, and concerned stakeholders of vegetable farming: Visayas State University (VSU)<br>University of Science and Technology of Southern Philippines (USTSP)<br>Benguet State University (BSU)<br>Policy: Policy recommendation for strengthening of partnership among key stakeholders in vegetable production and for knowledge/ info pathway of key stakeholders of vegetable production.  | University of the Philippines Los Baños (UPLB), University of Science and Technology of Southern Philippines (USTP), Visayas State University (VSU) | Primary beneficiaries :no selected vegetable production sites in Cebu, Leyte, and Benguet<br>Secondary beneficiaries :no researchers, students, farmers and LGUs  | 01-Nov-23 | 31-Oct-27 | ONGOING                         | 14,953,090         | 2,883,743.00     |
|               | Compendium of Developed Agricultural and Fisheries Mechanization Technologies in the Philippines  | Integrity of the environment and climate change adaptation and mitigation | The Higher Education Institutions/State Universities and Colleges (HEIs/SUCs), including research and development institutions (RDIs to include PhilMech, PhilRoc, DOST, to name a few) are the major technology generators as part of their mandate in research and development, extension and public service efforts. Moreover, other private agencies, including local manufacturers are good sources of information on agri-fisheries technologies. However, these developed technologies often times do not reach the target end-users or commercial level due to various reasons such as the lack of funding support for extension activities, limited coverage of the HEIs/SUCs and the lack of manpower, among others. The compilation of available technologies, specifically, agri-fisheries mechanization technologies developed through the years by the HEIs/SUCs into a compendium will be a very useful tool in the promotion of these agri-fisheries mechanization technologies. The compendium will be distributed to different stakeholders both either in hardcopies or e-copies. These include the HEIs/SUCs, government and non-government agencies assisting farmers and other end-users and local manufacturers who are the possible fabricators and suppliers of these technologies. This will also be providing vital information on readily available technologies which can already be adopted, promoted, locally manufactured and utilized for the benefit for intended beneficiaries as well as technologies that need modifications and improvements.  | Publication: 1) The primary output of the project is the publication of the Compendium of Developed Agricultural and Fisheries Mechanization Technologies in the Country<br>Patent: A copyright will be applied for the compendium for the compendium and the DBMS<br>Product - The compendium and the database are the main output of this project which will be an important information materials for RDI and public service activities of research and development institutions (RDIs) & HEIs/SUCs, and private entities involved in agri-mechanization technologies development and promotion.<br>People and Services - The compendium will serve as a reference material or a guide for local fabricators who want to venture or fabricate locally-developed technologies either through collaboration or licensing agreements.<br>Places and Partnerships - Major agreements will be forged in the form of MOU with the different HEIs/SUCs, Agricultural and biosystems engineers and/or researchers will be trained on handling database management information system that will be developed for the project.<br>Policies - The project output can be utilized for the Nations<br>Agri-Fisheries Mechanization Program (NAFMP) of the Mech Law in the determination and/or accomplishments of its target accomplishments. The compendium is expected to provide information on the available mechanization technologies for the agri-fisheries sector. | University of the Philippines Los Baños (UPLB)  | Target beneficiaries of the project outputs are agricultural and biosystems engineers, RDE workers in HEIs/SUCs and research and development institutions, ABE undergraduate and graduate students, local manufacturers, ABE of DA-Regional Field Units nationwide, policy and decision makers in agricultural and fisheries mechanization, DA-Bureau of Agricultural and Fisheries Engineering (DA-BAFE), among others   | 01-Jul-23 | 31-Dec-24 | ONGOING                         | 5,000,000          | 1,891,503.37     |
|               | Deployment of a Data-Driven Assessment System (MDAS) of the Mechanization Resources of the Sugarcane Industry for Improved Mechanization and Field Productivity   | Rapid, inclusive and sustained economic growth                            | MDAS stands for Mechanization Resource Mapping and Data Analysis System. It is composed of a paperless mobile survey app, database, and an analysis using Geographic Information System (GIS). It was developed to address the need to augment the planning, implementation, monitoring, and data analysis in the management of mechanization programs. Pilot test outputs of the previously PCAARRD-funded project resulted in a user-friendly app and better functionality and syncing with the database. Also, data analysis using GIS, an open source application, generated thematic maps that are useful in ascertaining the mechanization situation in a particular area and allow a more focused and well-targeted interventions. This project is a culmination of the development of the MDAS system as it will be utilized on a national level to determine the mechanization resources of the sugarcane industry. It seeks to address problems on: 1) lack of reliable up-to-date data on mechanization resources that can be used for mechanization planning; 2) lack of baseline information of the different mill districts resulting in inaccurate interventions; and 3) lack of unified mechanization plan for the sugarcane industry.   | Publication: One (1) oral poster presentation on the results of the project at a local/international conference. One (1) journal publication. One (1) MDAS User Manual. One (1) MDAS Training Manual.<br>Two (2) Audio-Visual materials/Patent: Two (2) Copyright registrations for the MDAS information system.<br>Paperless Survey App.<br>Methodology of MDAS for data acquisition, storage, and analysis. Two (2) copyright registration for IEC materials: 1 user manual and 1 training manual copyrights.<br>One (1) trademark for MDAS logo/Product: One (1) enhanced optimized MDAS System/People and Services: Trained 30 personnel of SRA and 20 Mill District Offices on MDAS System i.e. Users App, data acquisition, storage, and analysis; information portal (e.g. custom operators, custom rates, etc./Places and Partnership: 2 MDAs/MOU/Letter of Commitment on collaboration with SRA, MDOs, and Custom Operators Policy: Policy recommendations on data-driven planning and monitoring; incorporation of geospatial analysis for strategic planning for mechanization interventions for a productive sugarcane industry.   | University of the Philippines Los Baños (UPLB)  | Sugar Regulatory Administration, Mill District Development Councils, Custom Service Operators, Farmer and Planter in General<br>Based on the discussion in the validation workshop there was some sort of consensus that the SRA should work hand in hand with the mill districts as every mill district has a management organization which looks after the affairs of the specific locality. SRA being the regulatory office can house the main server but each mill district should have an access to the data and the infographics that is generated. These they will use for their specific localized mechanization planning and monitoring. With each of the mill districts completely profiled SRA then can consolidate the different specific plans to come up with a comprehensive national plan. This will harmonize the data for the whole industry and allow more accurate information across different levels in the industry. The whole farming and milling population will be poised to benefit from employing the system. | 01-Jun-23 | 31-May-26 | ONGOING                         | 15,539,090         | 5,107,329.30     |
|               | Development of an Unmanned Ground Vehicle Drones Aided System with vs-NIR Sensors for Soil Nutrient Mapping of Coffee Farms   | Integrity of the environment and climate change adaptation and mitigation | The agricultural sector in the country contributes 8.8% to the national economy. Crops like coffee, mango, abaca, and tobacco production deteriorated in response to the production in the same period of the previous year (Philippine Statistic Authority, 2017). One of the reasons for decreasing growth is the low production of crop plantations as a result of poor farm practices, lack of equipment, and inadequate post-harvest equipment and facilities. Likewise, there is a limited access to materials and information on farm nursery establishment and proper seedling handling. There is also limited access to the proper water and soil nutrient management. All these factors contribute to the low productivity of the sector who also limits its potential for product importations. With the support of the government to strengthen the sector, national programs are developed to improve its current production. The project will design, fabricate and test an unmanned ground vehicle with vs-NIR sensors to operate soil nutrient measurement and mapping services in the Philippines. It will be implemented following the rapid-process-output-outcome approach and will go through series of processes from idea validation, fabrication, evaluation up to deployment. The data collected through the equipment will help the coffee farmers be efficient soil, nutrient and water of their farms which will lead to improved farm productivity. The UGV UAV-aided system with vs-NIR sensors for real-time and quick analysis of soil nutrients of coffee farms in the Philippines.   | Year 1: Assessment of the perception and acceptance of target clientele about unmanned ground vehicle (UGV) Soil Nutrient Analyzer; Fabricated spectroscopy instrument (SI) and UGV platform fabrication; Integrated SI & UGV platform<br>Year 2: Prototype of unmanned ground vehicle equipped with vs-NIR sensor; Reliable prediction models of soil properties; Integrated software of the UGV vs-NIR unit for soil property measurements and soil nutrient mapping; 1 patent/utility model application; 1 copyright; at least 2 paper publications/Publications<br>publish at least 2 articles in ISI/Scopus-indexed journal; 1 operations manual journal. Patents/Intellectual Property apply for patent/utility model of the equipment Products * 1 prototype of Unmanned Ground Vehicle System with vs-NIR Sensors coupled with unmanned aerial vehicle   | Cavite State University (CVSU)  | Farmers, researchers and soil scientists, local government units  | 01-Jun-22 | 31-Mar-25 | ONGOING                         | 11,229,714         | 1,214,299.00     |

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|---------------|---|---|--|--|---|--|-----------|-----------|----------------------------------|--------------------|------------------|
|               | Development of Microbial and Plant-Microbial Combinations for Bioremediation of Pesticide Contaminated Vegetables Areas in Selected Provinces | Rapid, inclusive and sustained economic growth                            | <p>Benguet farming areas and vegetables have been reported to be contaminated with varied pesticide residues, with chlorpyrifos being one of the highest and commonly detected in vegetables and soil (Reyes &amp; Laurean, 2007; Lu, 2010; Ngjilo, 2013).</p> <p>Preliminary studies done to isolate microbes, particularly endophytic bacteria from persistently contaminated farms in La Trinidad, Benguet had yielded a number of species with extremely high tolerance to chlorpyrifos and some with moderate capacity for degradation in vitro. These were identified by 16S rDNA sequencing as <i>Aerobacterium</i> sp., <i>Kocornella sacchari</i>, <i>K. oryzae</i>, <i>Pseudomonas monticola</i>, <i>Raoultella ornithinolytica</i>, <i>Pseudomonas stutzeri</i>, <i>Enterobacter</i> sp., <i>E. asburiae</i>, <i>E. cloacae</i>, <i>Klebsiella pneumoniae</i>, and <i>Paritoba agglomerans</i> (Guayo and Tpayno, 2021).</p> <p>This research intends to use indigenous populations of pesticide degrading microorganisms and associated plants in developing formulations for the purpose of reducing pesticide residues in selected contaminated vegetable areas in Benguet, creating a safer environment at the same time improving soil health and productivity. The first phase consists of isolating fungal, soil and endophytic bacterial populations with high tolerance and degradation capacity for organophosphate pesticides commonly detected in Benguet vegetable areas and evaluate their plant growth promoting characteristics. The second phase is intended for the optimization of growth conditions as a bioindicator and development of microbial culture formulations for effective delivery and sustained growth of isolates in the soil. The third phase of the project will assess pesticide residue reduction and soil quality change in pesticide contaminated soils under controlled environment after inoculation with new isolates as well as microbes isolated from previous studies and their combinations and in consortia with host and</p>   | <p>Expected Outputs</p> <p>Objectively Verifiable Indicators (OVIs)</p> <p>Y1</p> <p>Y2</p> <p>Y3</p> <p>Total</p> <p>Publications</p> <p>2</p>  | Benguet State University (BSU), Cebu Technological University (CTU) | Farmers, whose farm soils can be restored to health. Ordinary consumers of farm produce, which is basically everyone. The health of the general populace consuming farm products and the health of the environment.  | 01-Apr-23 | 31-Mar-26 | ONGOING                          | 21,451,592         | 4,061,644.00     |
|               | Development of nanofertilizer from poultry waste biogas digestate   | Integrity of the environment and climate change adaptation and mitigation | <p>The project is a research collaboration between the University of Mindanao and Ana's Breeders Farm, Inc. (ABFI). ABFI is one of the leading integrated poultry farm producers of high-quality broiler chicken meat in the Philippines. Their scope of operation includes feed mill plant, parent stock farms, hatchery, broiler farms, dressing plant, cold storage facility, and meat processing plant. One of the problems the company is facing is the stability of their fertilizer from chicken manure. A key of the factors that affect marketability are the undesired odor and moisture possessed by the produced fertilizer. With a production rate of 120 m<sup>3</sup> digestate per day in their biogas reactor, the company is expected to receive 12 tons of fertilizer after 30 days of fermentation. Although the company's existing technology uses a decanter to separate the solid fertilizer, the approach was not enough to produce fertilizer with higher market value. The current technology is estimated to cost Php 20 per kg for the treatment, while the market price of the product is only at Php 2, hence, the company is suffering a significant loss, and thus, the process must be improved. Organic fertilizers such as these are cheaper than chemical fertilizers, e.g. urea which is priced at around Php 1140 per sack or Php 22.8 per kg. The use of this fertilizer will result in the increase our farmer's profits through reduction of fertilizer cost and at the same time increasing crop yield. This project aims to produce a nanofertilizer which is considered a promising approach to improve crop production, thus, making it more attractive in the market. The project also aims to develop a technology to deodorize the produced nanofertilizer to increase its stability. Biofiltration is the technology for deodorization over the others. Various technologies are available such as chemical scrubbing and adsorption, but these technologies produce secondary products that require additional treatment. Four products are expected for this project, namely: solid nanofertilizer, N-P-rich liquid nanofertilizer, N-K-rich liquid nanofertilizer, and purified water which can be used for plant operations.</p>  | <p>Publication: At least one (1) publication for the technology to simultaneously deodorize and produce solid and liquid nanofertilizer from biogas plant digestate. Patent: At least one (1) patent application for the technology to simultaneously deodorize and produce solid and liquid nanofertilizer from biogas plant digestate/Product: Products (3) Solid Nanofertilizer Liquid Fertilizer Biogas plant digestate processing equipment/People: People and Services (5) 2 Masters students and 3 undergraduate students, Phase Places and Partnerships (2) Partnerships with Ana's Breeders Farm Inc. and Radior Manufacturing Inc. Policy: N/A</p> | University of Mindanao-Bolton (UM-Bolton)                           | Ana's Breeders Farm Inc. General Community Environment Academe (researchers, educators, students)  | 01-Apr-22 | 30-Sep-24 | COMPLETED                        | 4,900,000          | 444,091.20       |
|               | Development of sustainable rice straw management using Trichoderma technologies   | Rapid, inclusive and sustained economic growth                            | <p><b>EXECUTIVE SUMMARY</b></p> <p>In the Philippines, the national rice production average is around 4 tons ha<sup>-1</sup> (PSA 2019). With two cropping seasons per year, a hectare of rice land can produce 8.0E+11.2 tons ha<sup>-1</sup> of rice straw based on a straw-to-grain ratio of 0.114 (RRR Rice straw management, 2015). One ton of rice straw removes as much as 8 kg of N, 2.7 kg of P2O5, and 20 kg of K2O in a one-hectare field (Dobbertmann and Farhust, 2002) hence successful incorporation of rice straw could mean significant improvement in soil fertility and reduction of fertilizer inputs. It was also found to increase the subsequent rice yield by 17.27% (Watanabe et al., 2017; Witt et al., 2000).</p> <p>Because of the large amount that is produced, rice straw management becomes an important component of sustainable rice production systems. However, rice straw burning has become a common practice since its decomposition rate is slow. The introduction of microbial inoculants, specifically <i>Trichoderma</i> species, were found to greatly contribute to the goal of sustainably improving soil fertility through crop residue incorporation. Recently, an in-situ competing technique of rice straw with <i>Trichoderma</i> activator and seed coating with <i>Trichoderma</i> Microbial Inoculant (MI) showed promise in increasing rice yield even in Cu-contaminated and drought-affected areas in Mogpog, Marikinaque (Cuevas and Banaay, pers comm.).</p> <p>This project is proposed to validate the <i>Trichoderma</i> technologies and develop a rice straw management strategy that can improve yield, increase farmers' income by reducing the cost of farm inputs (fertilizers and pesticides), mitigate the effects of climate change and has the potential for bioremediation. With the soaring prices of fertilizers and pesticides in the global market, the result of this project will have a great impact on our rice farmers.</p> <p>Cassava is planted yearly in about 120,000 hectares of agricultural land in the Philippines, producing about 1.8 million tons of cassava roots. The demand for cassava is increasing and will continue to increase with continued increase in the number of consumers and improvements in processing cassava roots into value-adding products. (DA-MAMAS, 2019) Farmers in the Isabela region of the Philippines grow cassava for livestock feed and industrial use. The San Miguel Foods Inc., one of their buyers, projected a demand for cassava tuber at 6 million metric tons, however, the 2019 actual cassava volume of production amounted to only 2.6 million metric tons. (PSA, 2020) Pest and disease problems is one of the pressing challenges of the cassava industry in the region. Limited access to technology and knowledge on management factors that influence PD prevalence and incidence is minimal. Cassava phytophthora disease, for instance, can reduce yield to about 50-70% when symptoms appear 4 to 6 months after planting. A 100% loss in yield may even occur when infection ensues during the first three months from planting. (PCAARRD, 2019). The occurrence and spread of the diseases will continue to affect yield and income of farmers specially the smallholders who are constrained with access to technology and disease management strategies. Continually relying on chemicals that are harmful to the environment could lead to a bigger problem. Therefore, it is necessary to re-examine alternative or complementary solutions from a different perspective.</p> | <p>Publication: One published research article in refereed journals/Patent: None/Product: None/People: Capacity building of farmer cooperators, and researchers and students from partner SUCs/Place: Collaborators with agro-cooperator farmer cooperatives in the study area, SUCs, and DA-RFOs/Policy: None</p>   | University of the Philippines Los Baños (UPLB)                      | Farmers, researchers, extension workers, students, policy makers   | 01-Apr-23 | 31-Mar-25 | ONGOING                          | 4,998,068          | 2,332,651.04     |
|               | Far-UVC Pulse Treatment: A Multi-Layer Approach to Suppress Three Major Cassava Diseases  | Integrity of the environment and climate change adaptation and mitigation | <p>Cassava is planted yearly in about 120,000 hectares of agricultural land in the Philippines, producing about 1.8 million tons of cassava roots. The demand for cassava is increasing and will continue to increase with continued increase in the number of consumers and improvements in processing cassava roots into value-adding products. (DA-MAMAS, 2019) Farmers in the Isabela region of the Philippines grow cassava for livestock feed and industrial use. The San Miguel Foods Inc., one of their buyers, projected a demand for cassava tuber at 6 million metric tons, however, the 2019 actual cassava volume of production amounted to only 2.6 million metric tons. (PSA, 2020) Pest and disease problems is one of the pressing challenges of the cassava industry in the region. Limited access to technology and knowledge on management factors that influence PD prevalence and incidence is minimal. Cassava phytophthora disease, for instance, can reduce yield to about 50-70% when symptoms appear 4 to 6 months after planting. A 100% loss in yield may even occur when infection ensues during the first three months from planting. (PCAARRD, 2019). The occurrence and spread of the diseases will continue to affect yield and income of farmers specially the smallholders who are constrained with access to technology and disease management strategies. Continually relying on chemicals that are harmful to the environment could lead to a bigger problem. Therefore, it is necessary to re-examine alternative or complementary solutions from a different perspective.</p> <p>This project seeks to reduce if not eradicate disease-infection in major cassava plantation in Isabela province. A new</p>   | <p>Year 1 Far-UVC pulse Treatment Technology with no harmful effects Cloud-based information system Standard procedures/protocols for the treatment monitoring developed</p> <p>Year 2 Men and women Cassava farmers &amp; stakeholders capacitated Publications submitted and presented and IEC materials produced/Utility model (web) and System Copyright registered</p>  | Isabela State University (ISU)                                      | More than 800 cassava farmers in the province of Isabela. At least three technicians from the DA-RFOs and DA Regional Crop Protection Centers (RCPCs) Two Local Government Units farmer-technicians. One private company (San Miguel Corporation), which greatly relies on Cassava for starch. | 01-Aug-22 | 31-Jul-24 | COMPLETED                        | 6,801,006          | 1,089,071.62     |

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|---------------|--|---|---|--|--|---|-----------|-----------|---------------------------------|--------------------|------------------|
|               | MANGGA - Mango Automated Neuralnet Generic Grade Assigner  | Integrity of the environment and climate change adaptation and mitigation | MANGGA is a project aimed to improve the quality inspection and sorting of export grade mango fruits through the development of an automated fruit grading and sorting system. Sorting and grading of mangos is usually done manually making it prone to error when voluminous fruits are being graded. The development of an equipment for efficient and accurate sorting and grading is necessary to reduce postharvest losses and have uniformity of graded fruits for export and local markets.   | Publications: One (1) scientific manuscript submitted for publication on referred journal. Training manual/IEC material on operation and maintenance of MANGGA/Products: One (1) minimum viable product of MANGGA system/One (1) mCNN mobile app for mango grade assignment/Places/Partnerships: One (1) partnership with a mango grower's association/cooperative/DAC/One (1) partnership with fresh mango exporting industry/cooperator/People: One (1) patent/utility model of the automated AI - operated mango quality sorting hardware/One (1) copyright of the MANGGA training module/One (1) copyright of image and chemical dataset of mango fruit quality/classification/People: Training of at least three (3) students on AI/Training of at least two (2) industry staff of the module on operation and maintenance of MANGGA/Training of at least one (1) mango association/cooperative on MANGGA/Policy  | University of the Philippines Cebu (UPCebu)        | 1. Mango growers and cooperatives.2. Mango fruit exporters and processors.3. Department of Agricultural Researchers   | 01-Dec-22 | 30-Nov-24 | COMPLETED                       | 7,290,906          | 1,041,426.04     |
|               | Near Real-Time Tracking Using GIS and Thermal Sensing Technology for FoR TR4 Detection and Prediction Dispersal in Banana (Old Title: Near-Realtime Fusarium Wilt Tracking using GIS and Thermal Sensing Technology) | Poverty reduction and empowerment of the poor and vulnerable              | Fusarium wilt had continued to devastate the banana industry, resulting in huge losses and bankruptcy (small growers and cooperatives) to those who cannot cope with the disease and eventually led to producing unmarketed. In view of these, some industry players suggested to initiate preventive measures to control the spread of the disease. The use for example of foot bath mixed with chemicals, limited the movement of farm workers to infected areas and cordoning of suspected infected sites. However, such measure is not 100% effective because they do not really know where the pathogen is and when it will infect plants. Additionally, introduction of tolerant variety had mostly been rejected by banana growers due to its market acceptability (specifically China) and the high cost of input associated to its production. This proposal is forwarded to examine in detail how Fusarium moves from one place to another by determining the latency of its infection though determining microbial load and presence of the pathogen in relation to topography, presence of other microbes and other parameters associated to its growth using thermal sensing technologies.   | Publication: One (1) publication of Methods on Detecting FoTR4 using the thermal imaging system in bananas. Published/Deposited at least one (1) article and social media content related to the project in any social media platform. Patent: One (1) Patent on Expert Information System. One (1) Patent Mobile Application/Product. One (1) Expert Information System/People: Two (2) industry players leverage in FoTR4 prevention. Place: Two (2) MOAs with banana player partnership/Policy: Two (2) organization policy recommendations on the protocols of FoTR4 early detection.  | University of Southeastern Philippines (USEP)      | The target beneficiaries of this project are small banana growers in Region XI and at least two major players in the industry (these are 24 Philippine Banana Growers and Exporters Association (PBGEA) members)  | 01-Mar-23 | 28-Feb-25 | ONGOING                         | 4,999,968          | 1,501,191.79     |
|               | Near-realtime Monitoring of Banana Nutritional Status and Yield Forecasting Using Airborne Multispectral Imaging   | Poverty reduction and empowerment of the poor and vulnerable              | The project intends to address nutrient management issues of cavendish bananas through the introduction of IoT-based multispectral nutrient sensing technology. This will be done by detecting shortages in macro elements requirements of cavendish bananas by analyzing fluorescence, reflectance and transmittance. This project will specifically evaluate the use of multispectral sensing for identify shortages of macronutrients (N, P, K) in the plant nutrition management of cavendish bananas. In addition, it will also look developing predictive models for determining the future fertilizer requirement and develop a nutrient management decision system for the banana industry. This research will use an Unmanned Aerial Vehicle (UAV) to remotely sense nutrient shortages and will utilize multispectral camera with bands capable of sensing near-infrared spectrum.  | Publication: One (1) Publication on the Near-realtime Monitoring of Banana Nutritional Status and Yield Forecasting using Airborne Multispectral Imaging. Patent: One (1) patent Near-realtime Monitoring of Banana Nutritional Status and Yield Forecasting. Products: One (1) Mobile application for Monitoring of Banana Nutritional Status and Yield Forecasting. One (1) web based Expert Management System. People Services: 1. Industry players and one Cooperative leverage in Banana nutrition management. Partnership: Three (3) traditional partners like Hijo Resources Corporation, one (1) banana cooperative, LGU/ORG of Itugum. Policy: 1. organizational policy on the protocols on plant nutrition management. Expected Impacts (2s) Social Impact: Leverage banana industry competitiveness, thus promoting S & T among its workers. Economic Impact: Yield increase by 20% and reduce fertilizer cost by 25%   | University of Southeastern Philippines (USEP)      | Hijo Resources Corporation<br>Banana smallholders   | 01-Jul-22 | 30-Sep-24 | COMPLETED                       | 5,000,000          | 1,644,519.24     |
|               | Pilot Testing of a Local Riding-type Rice Transplanter (Phase II)  | Rapid, inclusive and sustained economic growth                            | PhilRice has developed a local riding-type transplanter under the project, Design and Development of a Local Riding-type Transplanter with funding from PCAARRD in 2016. Series of field tests were conducted in Nueva Ecija during the first pilot testing conducted in 2018 and necessary modifications were incorporated in the design that improved the machine's performance. The machine can transplant 2 ha/day; transplants 26 seedlings per hill at 26" on planting depth, with 120" x 18" on hill spacing, and 30 cm fixed row spacing. The machine had an average missing hills of 9.27% which passed the PARES standard with %41.0% missing hill and uniform seedling distance and placement requirement. There is a need to conduct the piloting activity to several pilot areas under different technical, economic, social, geographical and environmental conditions to determine the acceptability of the technology. During the piloting stage, the prototype would be subjected to different field conditions and modified accordingly.  | The expected output of this project:<br>1. A technically efficient, economically viable, and socially acceptable riding-type rice transplanter that is being manufactured by accredited manufacturers for commercial production.   | Philippine Rice Research Institute (DA - PhilRice) | 1. Farmers/Seed Growers<br>1. Seed Centers/Cooperatives<br>1. Irrigators Association<br>1. NGOs<br>1. Private Company (Local Manufacturers)   | 01-Apr-23 | 31-Jan-25 | ONGOING                         | 2,213,778          | 508,567.07       |
|               | Precision Agriculture for Improving the Productivity and Economic Profitability of Cabbage and Potato in Benguet   | Rapid, inclusive and sustained economic growth                            | The Cordillera Administrative Region is the top producer of cabbage and potato in the country due to the suitability of the crop to the region's favorable climatic environment particularly in the Benguet Province as the major growing area for semi-temperate vegetables. The region produced 82.6% or 15.70 thousand metric tons of potatoes and 71.7% or 19.42 thousand metric tons of cabbage in the country (PSA, 2022). While Benguet Province is known as the "Cabbage Bowl" of the Philippines, due to its huge production of vegetables and its important role as major supplier of vegetables to the whole country, it was considered and described as a "cabbage favored area (LFA)". An LFA is an area that faces agro-ecologic and socioeconomic resource constraints that allow only low income to be realized and the province also suffers from poor or lacking infrastructure that supports commercial agriculture (Milagrosa, 2006).   | Publications: Two (2) nitrogen guides/At least one (1) journal article/Two (2) flyers (GreenSenseKeri) and chlorophyll meter). Patents: One (1) patent for mobile app. One (1) patent application for website for fertilization guidelines for potato and cabbage field-specific nitrogen fixed. Products: One (1) mobile application for nitrogen rate calculation developed/One (1) website for fertilization guidelines for potato and cabbage field-specific nitrogen developed. People: Two (2) farmer cooperators capacitated/Two (2) undergraduate/graduate student assistance/10 researchers trained/Ten (10) farmer capacitated. Places and Partnerships: Four (4) local partnerships (LGUs and farmers from Alok and Mansakayan). One (1) international partnership. Policy: One (1) policy brief pilched in support of the promotion of sensor-based nutrient management in local government units.   | Benguet State University (BSU)                     | Researchers/Research Agencies/SUCaFarmers, Students/Agriculture sector  | 01-May-24 | 30-Apr-26 | ONGOING                         | 4,999,619          | 2,643,212.00     |
|               | Rehabilitation of heavy metals contaminated agricultural areas along the Taft River Basin  | Rapid, inclusive and sustained economic growth                            | This proposed project is part of the phase 2 of the recently concluded project of Northwest Samar State University (NWSSU) with DOT-PCAARRD titled "Suitability Assessment for Agriculture and Aquaculture Food Production of the Floodplains of the Taft River Basin Impacted by Post Operations of Bagacay Mines". The project reported, very high levels and alarming rates of heavy metal contamination above permissible limits in the soil, agricultural crops, aqua-fauna commodities, as well as water quality in the area. A total of 26 rice farmers currently cultivating in highly contaminated agricultural soils in Barangays Malinao, San Pablo, Mabuhay, and Burak/Lumatod with a total of 60 hectares rice field production areas within the river basin are directly impacted. A total population of 1,380 people are also residing within these identified barangays with very high contamination, that makes these people vulnerable and with high exposure to heavy metal contamination. Thus, the research project team from NWSSU, with the guidance and technical assistance of the institution's Balik Scientist Fellow, Dr. Venecio U. Ultra Jr., proposed this project to address and be the intervention in mitigating the impacts of heavy metal contamination within these highly contaminated agricultural soils through bioremediation approaches and technologies. Established protocols and key findings of the project will not just be applicable for Taft, Eastern Samar, but also in heavy metal contaminated environments in the Philippines. The proposed project, looks into the 1. Utilization of indigenous plant species and non-food crops suitable for revegetation and ecological restoration of highly contaminated soils with heavy metal. 2. Application of beneficial microorganisms for enhanced phytoremediation of HM contaminated environments; 3. Application of soil amendments to enhance the ecological rehabilitation of HM contaminated environments; and 4. Efficient and economical utilization of biomass produced from the rehabilitation process. | Publication: At least four (4) research article submitted for publication / published in high impact journal (ISI, Scopus, etc.) to have a wide range of information dissemination to researchers and experts. Patent: At least two (2) utility model on the process optimization of bioenergy production, essential oil, and building material submitted for publication at IPQHIL. Product: At least one (1) building material (bio-crete) produced from plant biomass of phytoremediation plant species. People: A total of twenty-six (26) rice farmers with a total farm area of 60 hectares currently cultivating in highly contaminated agricultural soils within Brgys. Malinao, San Pablo, Mabuhay, and Lumatod/Burak, Taft, Eastern Samar will be the target direct recipient of the project's outputs. Unproductive agricultural areas within their farms will be site for field trials on phytoremediation and rehabilitation. At least 5 BSU students involved in the project, as part of their undergraduate thesis. At least 10 LGU officials of Taft participated in stakeholders forum. Place: One (1) MOA established between the LGU of Taft, Eastern Samar and Northwest Samar State University (NWSSU) for the joint effort in the rehabilitation of heavy metal contaminated agricultural areas along the Taft river. Policy: One (1) policy brief prepared on rehabilitation and ecological restoration of heavy metal contaminated agricultural soils along the Taft river. This document seeks to provide a legal basis in the rehabilitation process for the Taft LGU, as well as the directly affected communities on site. | Northwest Samar State University (NWSSU)           | Clients/Expected Outcome / Effects Of The Project Output<br><br>Twenty-six (26) rice farmers with a total farm area of 60 hectares currently cultivating in highly contaminated agricultural soils within Brgys. Malinao, San Pablo, Mabuhay, and Lumatod/Burak, Taft, Eastern Samar<br><br>Improved productivity status of unproductive, heavy metal contaminated agricultural soils within the site. At least one (1) farm area will be identified as site for field trials on phytoremediation and rehabilitation.<br><br>LGU of Taft, Eastern Samar | 01-Jan-23 | 31-Dec-24 | ONGOING                         | 4,996,522          | 1,837,054.00     |
|               | Smart Indoor Farming System for Hot Pepper and Tomato Production in the Philippines  | Integrity of the environment and climate change adaptation and mitigation | The technology is an indoor production system for hot pepper and tomato production under tropical conditions. The test crops will be provided with a controlled environment including production input requirements through smart agriculture principle and system. There is an existing glasshouse in the University Research Center which will be converted into a smart greenhouse which will have retractable solar panels, cooling pads, elevated containers for planting and LED lights. This should save years' production of these priority crops. Moreover, higher yield and quality products are expected due to better management of pests and diseases. While a fully-automated structure is costly, solar energy will be designed to power the structure to reduce the operating cost. It is expected that this project will create a functioning and sustainable smart greenhouse with automated monitoring and intervention system to control the proper crop care management for any crops. This will serve to create an impact among future food growers to produce crops sustainably.   | Publication: At least 1 (one) publication in scientific journal. Patent: 1 (one) patent application/Product: One product. People: At least 4 (four) undergraduate student and 2 (two) graduate student of agriculture, soil science, crop production, and agricultural engineering/Place: 1 (one) partnership (with Chungbuk National University/Policy: None  | Central Luzon State University (CLSU)              | The target beneficiaries for the project are:<br><br>CLSU and Chungbuk National University researchers through the partnership and benchmarking.<br><br>Other researchers and students who will pursue further research on indoor farming based on the resulting publication and patent from the project; and<br><br>Farmers and extension workers, who will be learning the technology thru field day and visits.  | 01-Aug-23 | 31-Jan-26 | ONGOING                         | 5,000,000          | 762,449.00       |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|--|--|--|--|--|--|--|-----------|-----------|----------------------------------|--------------------|------------------|
|  | Sustainable Indoor Farm for Growing Leafy Vegetables using Artificial Lighting (SIGLA): Performance Testing and Evaluation of Solar-powered Modular Indoor Vertical Farm | Rapid, inclusive and sustained economic growth               | Interest in indoor vertical farming, also known as plant factory with artificial lighting (PFAL), is rapidly growing because of the production constraints associated with traditional open-field farming. The potential of growing high-value leafy greens all year round without the influence of the outside environment, high planting density, and low space requirements make indoor vertical farming highly suitable for industrialized and urban areas. <b>Objectives:</b> <b>1.</b> Establish a demonstration unit for urban farming that can be adopted by local government units (LGUs), private companies, and individuals who are looking into venturing into urban agriculture. <b>2.</b> It is envisioned that SIGLA will serve as a demonstration unit for urban farming that can be adopted by local government units (LGUs), private companies, and individuals who are looking into venturing into urban agriculture. <b>3.</b> The information obtained from the benchmarking and literature data will be applied to optimize the production and operation management of SIGLA, a solar-powered modular indoor vertical farm that will be established through the RDR-PIH Joint Science and Technology Research Program. The performance of SIGLA in growing high-value leafy greens will be evaluated based on its sustainability and resource use efficiency. Carbon footprint and cost-benefit analysis will be conducted to assess its environmental impact and the marketability of the system for deployment and adoption, respectively. <b>4.</b> The information obtained from the benchmarking and literature data will be applied to optimize the production and operation management of SIGLA, a solar-powered modular indoor vertical farm that will be established through the RDR-PIH Joint Science and Technology Research Program. The performance of SIGLA in growing high-value leafy greens will be evaluated based on its sustainability and resource use efficiency. Carbon footprint and cost-benefit analysis will be conducted to assess its environmental impact and the marketability of the system for deployment and adoption, respectively. | Publications: 6EA (at least one (1) scientific paper for presentation/publication) 6EA (at least one (1) IPR of SIGLA) 6EA (at least one (1) copyright of training manual for establishing and operating SIGLA) 6EA (at least one (1) multi-layer Nutrient Film Technique (NFT) growing system with artificial lighting) 6EA (1) prototype of SIGLA 6EA (1) protocol/training manual for establishing and operating SIGLA 6EA (1) research paper for publication 6EA (1) BS student collaborator for research 6EA (at least one (1) faculty collaborator/knowledge sharing and training activities on indoor vertical farming to various stakeholders) 6EA (at least 80-100 students) 3-4 groups of SUC representatives 30-100 audience from seminars, conventions, etc. <b>Planes and Partnerships:</b> Collaboration with Seaview National University (SNU), South Korea-Potential Impact/Social Impact 6EA (Promotes urban farming) 6EA (Encourages local communities and the youth to venture in modern agriculture) 6EA (Will help address limitations of open-field farming) 6EA (Produces high-quality, clean, and pesticide-free leafy vegetables) 6EA (Addresses issues on aging and dwindling workforce in the agricultural crop sector) 6EA (Better work conditions) 6EA (Economic Impact) 6EA (Higher income from increased production volume and good marketable quality produce) 6EA (Off-season production of crops can increase market price) 6EA (Lower farm-to-market expenditures resulting to stable market price) 6EA (Widespread adoption of the technology can result to a more competitive market for vegetables and other high-value crops)   | University of the Philippines Los Baños (UPLB)   | Agri-entrepreneurs and agri-enthusiasts (urban growers) Food service industry (restaurants, cafés, hotels) Private companies/Individuals (e.g. High-end supermarkets, agri-suppliers, and manufacturers) Local Government Units (Agro-tourism projects) Research institutions (R&D projects)                               | 01-Jan-23 | 31-Dec-24 | ONGOING                          | 3,741,000          | 1,401,484.00     |
| Strategic Postharvest Research for Innovative and Novel Technologies for Horticulture Industry Development (SPRINT-Hort) | Project 1. Postharvest Systems Improvement of Selected Horticultural Value Chains  | Rapid, inclusive and sustained economic growth               | Huge volumes of crops are lost after leaving the supply chain and eventually go to waste due to improper handling, poor packaging, lack of storage facilities and technologies and lack of awareness among supply chain actors that losses occur. These result in income foregone for farmers and traders alike, as well as less available marketable supply for the consuming public. Since postharvest handling is an integral component and a critical link between production and consumption, a systems approach is needed to address specific postharvest problems. A value chain approach, in particular, that considers determining the status, needs and possible solutions to specific challenges faced by a given industry through collaborative efforts and partnerships of various actors and relevant support agencies in the chain will increase the likelihood of technical interventions being applied and taken up by the stakeholders in the long run. The recent changes in the global agri-food chains create both opportunities and challenges to horticulture industry stakeholders particularly of developing economies like the Philippines. These are compounded by a new set of challenges associated with more demanding quality standards and compliance with new food safety and other legislations related to environmental protection enforced by supply chain management companies and government agencies. Hence, supply or value chains in economically developing countries need to be strengthened and improved to enable food production in an economically, environmentally and socially sustainable way so that losses will be decreased to a minimum.   | Publications— 2 articles in refereed scientific journals— Patent/Intellectual Property- no patent only document on loss assessment protocol— Oral (2) and poster papers (2) for presentation in scientific conferences/products— 4 Training modules (1 each for partner SUC for farmer-processor, 1 each for farmer-consumer, and 1 each for partner SUC and USA)— 7 ITC materials on proper postharvest handling of selected commodities— Commercialization protocol on industrial up-scaling of selected horticultural crops/produce and services— Trained co-operators and personnel— Addition to scientific workforce by graduating postharvest science majors/through the project (BS/MS/PhD)— Provision of services such as Training or seminars conducted or organized/Planes and Partnerships— — Farged 5 MOAs or MOUs between UPLB and SUC partners and at least 7 supplemental MOA with industry partners— Established collaboration between and among UPLB, multidisciplinary team (postharvest technologists, physiologists, biosystem engineers, socio-economists)— Established collaborations with key agricultural research universities (BSU, CULSU, NYSU, VSU and CNAO), Department of Agriculture (DAR) Offices, and industry partners: private companies, Farmer's associations, etc. and LGU's— Policies— Policy briefs on postharvest loss reduction— Impact to proposed policy/social impact: The project will advance knowledge and evidence-based improvement of horticultural value chains as prioritized in DOST's HRDA 2017-2022 for ANAR and mainstream/multilocation trials and innovative technology transfer for various technologies/Planes and Partnerships— Established collaborations and partnerships between and among the academe (research and extension) and the industry/Economic Impact: With the increase of marketable, competitive and affordable commoditising postharvest technologies that could also provide increased income/profit to industry/stakeholders in a more sustained manner.   | Benguel State University (BSU), Nueva Vizcaya State University (NVSU), Central Luzon State University (CLSU), Camarines Norte State College (CNSC), Visayas State University (VSU), University of the Philippines Los Baños (UPLB) | 6EA Food industry stakeholders such as farmers, traders and processors who will be knowledgeable about the natural preservation systems for fresh horticultural produce; 6EA Researchers, academic staff, and public sector representatives for technology verification and promotion                                      | 16-Mar-23 | 15-Mar-26 | ONGOING                          | 35,089,242         | 9,861,113.85     |
| Strategic Postharvest Research for Innovative and Novel Technologies for Horticulture Industry Development (SPRINT-Hort) | Project 2. Development of Low-Cost Cooling and Storage Systems for Horticultural Produce   | Rapid, inclusive and sustained economic growth               | Horticultural produce have short shelf life, hence cooling is essential. Optimum cooling can be achieved by mechanical refrigeration but its high investment and operational costs deter adoption. The project will develop low-cost cooling and storage systems for priority fresh produce, determining first the storage practices and requirements of potential users to substantiate the three studies: 1. Development of coolbox cold storage; 2. Development of commercial-scale evaporative cooler; and 3. Development of integrated storage management systems. Coolbox cold storage has been reported to save 70% of upfront cost, 100% installation cost, 40% grid energy cost and 65% servicing cost relative to the conventional cold storage. Evaporative cooler (EC) is also a low-cost storage technology but previous designs are suited only for small volumes of one ton or more, the EC system needs water and air circulating and ventilation system. Grid energy-powered components of the coolbox cold storage and EC can be powered through photovoltaic solar panels, thereby enhancing renewable energy use and enabling storage application in off-grid areas and in areas where grid energy is costly and unreliable. Moreover, integrating postharvest treatments during storage of fresh produce has been shown to increase storage efficiency which is a more sustainable solution to reduce postharvest losses.   | Products: 1 prototype of grid and solar powered coolbox cold storage with one-ton capacity; 1 interactive spreadsheet-based mathematical model of evaporative cooler; 10 commodity-specific integrated storage management systems (mango, banana, pineapple, citrus, tomato, eggplant, bitter melon, okra, mung, roses) People and Services: at least 3 students taking part in research activities for their thesis/informed and/or educated food industry stakeholders such as producers, food handlers, marketers, processors, policy makers and other development partners through information dissemination (e.g. attendance in conferences, symposia, EC, etc. Planes and Partnerships: Collaboration with an outside UPLB consulting services within and outside UPLB; team teaching of short courses on postharvest handling, storage and systems improvement/implementation of selected matter of relevant horticulture and postharvest subjects in undergraduate and graduate programs/Publication: at least 3 papers in refereed scientific journals; at least 3 conference papers; at least 10 EC materials/Impact: at least 2 pilot trials on postharvest loss reduction strategy, postharvest research and development strategy, and storage systems for horticulture industry development/Patent/utility models, 1 each for Coolbox storage, and evaporative cooler prototypes/Potential Social Impact: The development and subsequent industry mainstreaming of low-cost storage technologies will contribute to be more effective control of postharvest quality and shelf life of fresh produce/Reduction of postharvest losses and increase in supply of and profits from fresh produce/Promotion of renewable energy use as grid power substitutes/Increase in market engagement and competitiveness of horticulture small-holder/Enhanced environmental sustainability through reduce carbon footprint of postharvest losses and energy consumption/Potential Economic Impact: The project's outcomes will ultimately lead and contribute to poverty alleviation and income security, food and nutrition security, and environmental sustainability.  | University of the Philippines Los Baños (UPLB)   | — Producers' groups/cooperatives, food handlers, marketers, and other stakeholders in the horticulture industry— Researchers/scientists, educators, policy makers and other development actors to adapt low-cost storage systems in research, education, training and policy making for horticulture industry development. | 16-Mar-23 | 15-Mar-26 | ONGOING                          | 12,885,000         | 3,468,108.84     |
| Strategic Postharvest Research for Innovative and Novel Technologies for Horticulture Industry Development (SPRINT-Hort) | Project 3. Development of Natural Preservation Systems for Fresh Horticultural Produce   | Rapid, inclusive and sustained economic growth               | Fresh commodities, like fruits and vegetables, are highly perishable. In the Philippines, postharvest losses are high even before the commodities reach consumers. With the increasing demand for safe, healthy, and nutritious food among consumers, there is a need to develop natural preservation systems that are locally available and as alternatives to chemical methods. These simple, sustainable, and eco-friendly preservation techniques include the use of plant-derived extracts, oils as coatings, probiotics as antimicrobials, and seed/soil waste by-products. The efficiency and effectiveness of these natural preservation systems can also be potentially realized through nanotechnology. Through innovative, safe, and natural preservation systems, postharvest losses in major fruits and vegetables can also be reduced, hence, contributing to the attainment of food and nutrition security.   | Products— 6 knowledge products: information on safe, natural, eco-friendly, and sustainable preservation techniques— 3 actual products: natural antimicrobial, postharvest dip and non-chlorine sanitizer, nano-based postharvest preservatives/Patent— One patent application of nano-encapsulated seed/soil-derived waste products, oils or plant-based compound for quality enhancement and shelf-life extension/People and Services— Informed and/or educated food industry stakeholders such as farmers, traders or processors through information dissemination (e.g. attendance to conference, symposia, EC, etc. at least 80)— Increased number in scientific workforce by graduating science majors through the project (at least 3 BS and MS degree holders/Planes and Partnerships— Enhanced research collaborations and established network coordination among PHTRC multidisciplinary team: (CRSP, CAFS, UPLB BIOTECH, UPLB IPR, UPLB Publications)— Publish at least one article in refereed journal (Scopus or ISI-indexed journal publication)— Present at least 4 technical paper and poster abstracts in scientific conferences— Prepare/publish at least 2 EC materials (brochures, posters/Infographics or flyers)— 1 short instructional video on how to perform the postharvest treatment/Policy— Drafted policy recommendation on natural preservation system for fresh produce in the horticulture industry which will provide baseline information for the generation of a policy brief for food loss and waste reduction which will be done in cooperation with the funding agency and research collaborators/Potential Social Impact: The project will advance postharvest knowledge by providing science-based and eco-friendly technologies on preservation systems using plant-derived extracts and oils, and seed/soil waste-based products/Potential Economic Impact: With the increase of marketable, competitive and safe commodities for a longer period of time through the use of the developed green postharvest preservation systems, stakeholders in the supply chain handling these selected commodities will have greater profit as well as confidence in marketing their produce. | University of the Philippines Los Baños (UPLB)   | — Food industry stakeholders such as farmers, traders, and processors will be knowledgeable about the natural preservation systems for fresh horticultural produce— Researchers, academic staff, and public sector representatives for technology verification and promotion   | 16-Mar-23 | 15-Mar-26 | ONGOING                          | 14,525,654         | 2,805,057.50     |
|  | Application of Cellulose Nanocrystals Extracted from BANDALUA Fiber as Reinforcement Material in Starch-Based Bioplastic Film  | Rapid, inclusive and sustained economic growth               | The project offers an alternative, eco-friendly, and sustainable option to replace or substitute the use of synthetic and petroleum-based plastic film. With nanocellulose being an emerging industry due to its high potential in composite application, the use of BANDALUA as source of nanocellulose as a bioplastic and as a reinforcement filler in the starch-based biocomposite film will be explored. This scientific endeavor would both add value to product development from BANDALUA fibers, particularly on the high-end potential applications of this bio-based nanomaterial, and could advance the bit for use of sustainable and environment-friendly materials.   | Publication: One (1) submitted journal article on application of nanocellulose from abaca as reinforcement material in starch-based bioplastic film Patent: One (1) Patent application filed on the abaca CNC reinforced starch-based bioplastic film Product: High alpha cellulose bleached pulp from abaca (BANDALUA) (Year 1) Cellulose nanomaterials (Year 1) Starch-based bioplastic reinforced with nanocellulose (bioplastic film) (Year 2) People: Technical seminar on the properties of BANDALUA pulp, derived cellulose nanocrystals and CNC reinforced TPS bioplastic film/Planes and Partnerships: Memorandum of Agreement with DOST-FPRDI, Visayas State University (VSTU), ALN/DECO (Benthic production of abaca pulp), and Coltop Group, Inc. (Camarines Sur)/Policy: At least one (1) draft policy recommendation on the use of BANDALUA nanocellulose as filler in bioplastic  | DOST-Forest Products Research and Development Institute (DOST-FPRDI)   | Plantation grower Pulp and paper industries Scientific communities Plastic manufacturers General public  | 01-Jul-24 | 30-Jun-26 | ONGOING                          | 4,999,217          | 3,134,321.00     |
|  | Chemical and Biological Management of Fungal Species Complex Infecting Onion Anthracnose   | Poverty reduction and empowerment of the poor and vulnerable | A project that aims to provide chemical and biological management options for sustainable management of onion anthracnose.   | Publication: at least 2 journal articles and 2 pamphlets/Patent: none/Product: at least two (2) fungicides with different modes of action and at least one (1) biological control agent identified effective against anthracnose pathogens/People: 100 onion growers, 2 RCPD III staff, 3 MAO, and 1 PAO Nueva Ecija/Policy: 5 letters of commitment with onion growers association in Nueva Ecija/Policy: none  | University of the Philippines Los Baños (UPLB)   | 100 onion growers, 2 RCPD III staff, 5 MAO, and 1 PAO Nueva Ecija  | 01-Jul-24 | 30-Jun-26 | ONGOING                          | 5,000,000          | 1,354,817.70     |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---------------|---|--|--|--|---|---|-----------|-----------|----------------------------------|--------------------|------------------|
|               | Development, Genotyping and Preliminary Evaluation of Genetically Stable Planting Materials of the Philippine Priority Medicinal Plants (PPMP)            | Rapid, inclusive and sustained economic growth               | This project is designed to complete the genotyping and evaluation of genetically stable planting materials of the 23 priority medicinal plants of the herbal industry.  | People<br><ul style="list-style-type: none"> <li>2 master's/PhD student thesis work on medicinal plants;</li> <li>2 bachelor's student thesis work on medicinal plants;</li> <li>30 students trained on genetic resources conservation and management of medicinal plants (10 through internship; 20 through plant genetic resources conservation and management courses offered)</li> <li>10 staff trained on cultivated medicinal species identification/genetic resource conservation and management</li> </ul> Produce: <ul style="list-style-type: none"> <li>At least 50 propagules/seeds of the three (7) asexually propagated medicinal plant (ginger, elemi, banaba, balaba-pusa, regano, talip-kuhr)</li> <li>At least 3,000 seeds of genetically stable seed-propagated medicinal plants (tawa-tawa, ampalaya)</li> </ul> Publications: <ul style="list-style-type: none"> <li>At least 3 Journal articles</li> <li>At least 2 posters presented in national/international conferences</li> <li>1 permit/annex reference of genetically stable medicinal plants</li> <li>At least 1 drafted standard on authentication of one (1) medicinal plant species</li> </ul> Partnerships: <ul style="list-style-type: none"> <li>At least 1 drafted collaboration project with at least one industry partner for the evaluation of the genetically stable lines on their respective farms)</li> <li>At least 1 drafted collaboration project with College of Veterinary Medicine, UPLB and/or BIOTECH, UPLB for the evaluation of the genetically stable lines using pre-clinical assays (12)</li> </ul>   | University of the Philippines Los Baños (UPLB)                      | Research organizations, men and women researchers, scientists, students, farmers, pharmaceutical companies, consumers, and the general public will benefit from a promising and genetically stable source of planting materials of medicinal crop species.  | 01-Jan-24 | 31-Dec-25 | ONGOING                          | 4,995,136          | 3,064,261.65     |
|               | Enhancement of Ubi (Dioscorea alata L.) Production through Trials and Demonstrations of S&T-based Farm Practices to Support Industry Development in Bohol | Poverty reduction and empowerment of the poor and vulnerable | Purple yam (Dioscorea alata L.), locally known as ubi is one of the most sought-after crops due to its economic potential not just as a staple food but as an in-demand crop for the food industry in the processing of high-value food and health products. The crop has been used by various industries offering healthy refreshments like ice cream as it is also known for its high antioxidant content, aroma, and attractive pigmentation in the country. Ubi production from 2017 to 2021 declined at an average annual rate of 0.4 percent. In Cebu province, the top producer region of this crop, for the same period also showed a declining trend (PSA, 2021). Bohol to be specific is one of the provinces in Region VII that is best known for its ubi (Kinsampang), an aromatic purple yam native to the province. Ubi production shared almost one-fifth (17.32%) of the total volume of rootcrops production in the province (Bohol PSO, 2021). However, ubi production in the province dropped in recent years. The decreasing trend is attributed to several factors such as the seasonality of the crop, infestation of pests and diseases, high cost of minisets (ubi planting materials), and low adoption of recommended technologies, among others. Recognizing the role of science and technology (S&T) and research and development (R&D) for the needed production and industry enhancement, the provincial government of Bohol sought the assistance of the Department of Science and Technology (DOST) through the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD). On May 18, 2023, therefore, DOST-PCAARRD initiated a meeting together with the local provincial government, PhilRootcrops, and other relevant local stakeholders/agencies in Bohol like the Provincial Agriculture Office, Regional DOST, and local research institutions, among others, to discuss the gaps and areas that need to be addressed through S&T interventions. Among the important gaps identified were the lack of available planting materials for the production, the evade seasonality of the crop due to its dormancy periods as well as the very low yield that is attributed to the low adoption of the recommended production technologies. A follow-through field and sowing trial were also conducted on June 23, 2023, to validate the gaps that have been mentioned. The PhilRootcrops, which is a prime mover in national rootcrops research and development, and which works on systematic undertakings to innovate and introduce more advanced technologies to fill the gaps and shape the rootcrops industries from production systems to consumption phase for sustainable and inclusive development especially among its beneficiaries, has been tasked to lead an S&T-based project that could help address the identified gaps. Hence, this project project. As agreed, this project has to address the insufficiency of quality planting materials and seasonality of ubi by conducting trials using the miniset propagation technique of selected varieties, facilitate the adoption of the S&T-based farm practices for ubi, and, lastly, measure the economic benefits of the adoption of improved cultural management practices over the traditional methods as well as of the miniset propagation technique over the conventional ones. | Publication: Regarding Publication, this project will develop and reproduce one (1) IEC material on ubi S&T-based farmers practices as well as one (1) IEC material for the miniset propagation technique. At least 100 pieces of the cultural management and propagation technique IECs will be distributed to the beneficiaries and stakeholders. At least one (1) article highlighting the results of the trials and demonstrations will be submitted to a scientific journal. The two (2) training modules will be developed to aid in the technology transfer activities. Patents: Copyrights of IECs and Manuals/Product: For the Products, this project will identify at least one (1) quality, high-yielding, adaptive to local conditions and year-round production of ubi varieties for Bohol. It will also increase the availability of quality ubi planting materials and raw material supply in the target areas. At least 10,000 ubi planting materials will be distributed by the project in the different areas of Bohol including those used in the demonstration farms. People: For People and Services, this is going to serve farmers, LGUs, and other concerned stakeholders involved in the ubi industry in Bohol. The project can benefit, especially the collaborating farmers, researchers, and stakeholders that will be involved directly in the implementation. This project is going to serve at least 30 farmer-beneficiaries to be trained on the ubi production and miniset propagation techniques. Place: In terms of Places and Partnerships, this is going to revitalize and expand ubi production in Bohol and engage cooperation among the different stakeholders through formal partnerships. At least 4 demonstration partners and at least 1 marketing linkage will be established by the project. The project will have collaboration with the Bohol Island State University, Bohol Provincial Agriculture Office, Bohol Experiment Station - DA Region 7, and the Alturas Group of Companies Policy. For the Policy, one (1) draft policy recommendation on the use and promotion of quality and high-yielding ubi varieties and/or agro-ecozones in Bohol, miniset propagation technique, and recommended S&T-based farmers practices for ubi production. | Visayas State University (VSU) Bohol Island State University (BISU) | Ubi farmers Processors Extension workers Policymakers   | 01-Jul-24 | 30-Jun-26 | ONGOING                          | 4,999,021          | 1,446,995.16     |
|               | Evaluation of Selected Musa Accessions and Disease Management Strategies Against Bugtok (Ralstonia solanacearum) Disease of Banana                        | Poverty reduction and empowerment of the poor and vulnerable | This project aims to fill the knowledge gap on resistance of promising Banana varieties and cultivars against Bugtok by generating data on the reactions of selected locally available Musa accessions.  | Publication: At least two (2) articles in an ISI-indexed journal/Patent: N/A/PhD/MS/BA/BS/PhD/1. At least one (1) thesis student authored to the project 2. One (1) training on diagnosis, detection, and management of bugtok disease 3. One (1) IEC material on control of bugtok disease/Policy: N/A/Policy: 1. One (1) policy recommendation for control of bugtok   | University of the Philippines Los Baños (UPLB)                      | Banana growers Banana breeders Non-government organizations Researchers Students  | 01-May-24 | 30-Apr-26 | ONGOING                          | 5,000,000          | 2,692,119.28     |
|               | Exploring the Efficacy of RNA Interference (RNAi) as a Biopesticide for Managing Sweetpotato Weevil, Cylas formicarius (Fabr.)                            | Poverty reduction and empowerment of the poor and vulnerable | Sweetpotato is an important root crop that is grown widely in the Philippines. In addition to its use as a food crop, sweetpotato has been used as an alternative ingredient to corn in the formulation of commercial animal feeds. Some losses of yield may be accounted to the damages caused by insect pests like sweetpotato weevil, Cylas formicarius (Fabr.) and viral diseases such as Sweetpotato virus disease (SPVD) caused by the synergistic interaction of the aphid-transmitted Sweetpotato leafhopper mottle virus (SPFMV) and vertically transmitted Sweetpotato chlorotic stunt virus (SPCSV). These and other diseases beset the sweetpotato industry in the country. Hence, the needs facing our farmers in the sweetpotato producing areas is the control of diseases and pests which can be addressed through development of varietal resistance, quality planting material, and implementation of disease or pest management strategies. One of the top priorities that have been identified by the farmers is pest and disease control management of viruses and insects like weevils (Fuglie, 2007). Therefore, this research project aims to address these needs as expressed by the farmers which will no doubt help this crop to continue to make significant improved income for them. Exploiting modern biotechnological advances can be used for managing insects like weevils. RNAi interference (RNAi) is one of these biotechnological advances and has been proven to be effective in managing pests and diseases of crops of agricultural importance. Here, we propose to develop an RNAi-based biopesticide against the SPW. The target gene is Laccase which is involved in sclerotization and pigmentation in insects. We hypothesize that as a result of the downregulation of laccase mRNA, the dsRNA prevents expression of the corresponding insect laccase protein and hence causes aberrant expression of the cuticle or may cause death or growth arrest.   | Publication: Three: 3 Undergraduate, 2 Graduate students (MS and PhD), 1 University Researcher, 1 Insecticide, 3 Research Internship/Postdoc. Three places and partnerships. Sweetpotato R&D Center in Tarlac Agricultural University: We will get the insects from them and will have consultation meetings with their staff with regards to the SPW infestations they see in the field. Our contact person is Ms. Shery Caluya. We are also in contact with Prof. Libeth Bajaj Laranang, a retired professor of TAU who is now the president of Mayantok Sweetpotato Farmers' Group in Camiling, Tarlac.; Insect Ecotoxicology Physiology Laboratory, Andong National University South Korea through Prof. Yonggyun Kim who will provide us with the RNA vector and control plasmid DNA; Institute for Agro-Environmental Sciences, NARO, Tsukuba, Japan; we will serve as our consultant with regards to the SPW genomic sequencing through Dr. Hiraiki Yoshitake.  | University of the Philippines Los Baños (UPLB)                      | Farmers, RCPC workers, students, researchers, academics   | 16-Jun-24 | 15-Jun-26 | ONGOING                          | 4,999,984          | 924,792.40       |
|               | Functional Genomics of Morphogenic and Oil Synthesis Genes from Coconut (Cocos nucifera L.) in a Model Monocot Zea mays L.                                | Poverty reduction and empowerment of the poor and vulnerable | This proposal aims to characterize the function of selected coconut morphogenic and oil synthesis genes using the coconut-maize transgenic expression model system and prepare preliminary components for enhanced coconut transformation technology. The functional analyses using the transgenic maize model will be able to validate and characterize the roles of the coconut genes involved in faster embryogenesis that faster and higher transformation efficiency and final stage of triacylglycerol (TAGs) in oleosin organelles. The transformation technology in coconut is a challenging area. By evaluating coconut genes and their functions using the maize model, genetic variations conferring favored phenotypes can be used in the advanced breeding process. By utilizing this pipeline, other coconut genes of interest can be further explored and utilized for advanced coconut breeding programs such as to breeding innovators like genome editing.   | Publication: - At least 2 ISI publications submitted for publication/Product: 3 transformation cocktails containing the 4 target genes (i.e., WUS, UBE1, and WRKY). Optimized transformation and regeneration protocol- At least 10 putative transgenic maize lines (at least 1 putative transgenic maize lines per transformation cassette). At least 10 regenerated transgenic maize lines in BLZ greenhouse containment). At least 10 transgenic lines with functional analysis data for transformation efficiency and regeneration for morphogenic genes and oleosin mechanisms in oil body distribution/People Services: 2 BSMS students supported (i.e., BS Biology, BS ABT, BS Agriculture, MS Genetics, MS MBB)- 1 hands-on training for partner PCAARRD at UPLB (at least 7 participants)- 1 training for morphogenic genes and transformation in maize at UH Manoa/Hawaii and Partnerships: Possible linkages with Corteva with material transfer agreement (MTA) for utilization of BSM and WUS constructs and Thymine negative Agrobacteria. Possible linkage through a Memorandum of Understanding (MOU) with the University of Hawaii at Manoa for maize transformation  | University of the Philippines Los Baños (UPLB)                      | Direct beneficiaries will be male and female plant physiologists and agronomists/agriculturists who will adopt the developed tissue culture, maize model, and transformation protocols for other related studies such as further improvement/enhancement of coconut and other Philippine crops of interest. It will also generate knowledge and development of techniques for enhanced gene expression studies for male and female students both in undergraduate (BS Agricultural Biotechnology/Biology/Agriculture) and graduate levels (MS and PhD in Molecular Biology and Biotechnology/Genetics). There is also equal opportunity for industry stakeholders who might have an interest in investing in the maturation of the technology developed for the production of coconut oil and other products derived from corn grains for food and industrial applications. | 01-Oct-24 | 30-Sep-27 | ONGOING                          | 17,619,275         | 3,560,167.00     |
|               | Genetic variability and selection for drought tolerance and disease resistance in sugarcane through in-vitro techniques                                   | Rapid, inclusive and sustained economic growth               | The productivity of the Philippine sugarcane industry is facing increasing threats from climate change-induced biotic and abiotic factors. The commercial varieties spread over 384,487 hectares of the major sugarcane regions of Cebu and Mindanao. In 2020, 90% of sugarcane farmers have shown increased susceptibility to smut and downy mildew, in addition to the increased intensity of drought and flooding. The project seeks to understand the genetic and phenotypic changes that occur during tissue culture and how extending tissue culture cycles can increase the likelihood of desirable changes. The science behind elite/or molecules for smut and downy mildew and their role in inducing plant defense responses as well as the use of selective agents for drought tolerance variants will be explored. After the early laboratory screenings, the promising variant will be grown in drought-challenged fields to further assess drought tolerance initially using the simple leaf curl test. Within the scope of this grant, the promising variant will, firstly, be utilized in the breeding pools for hybridization, and secondly, to enhance the permit/annex collection of alleles for disease resistance. However, by the end of the grant, we anticipate having a sufficient number of samples to conduct replicative trials for diseases and drought. These trials will pave the way for the potential release of somaclones, which can be reintegrated into advanced, multi-location trials focusing on yield and disease resistance. This, in turn, will facilitate the re-release of improved somaclones of the once-elite sugarcane varieties. In sum, this proposal utilizes the simplest approach to tapping sugarcane heterozygosity not only seeks to reintroduce disease-resistant variants of top performing varieties but also may potentially enhance genetic diversity in the farmers field.  | Publication: At least one (1) publication submitted in a scientific journal/Patent: In vitro screening protocol for disease resistance/Product: At least one (1) potential variant with improved resistance to drought and at least one (1) potential variant with improved resistance to smut and downy mildew resistance/People Two (2) project staff trained and capacitated on the role of in vitro culture detailing the induction of somaclonal variations and increasing the likelihood of desirable genetic changes, and 1 BS and 1 MS student supported/Place: MOU with Central Philippine State University (CPSU) and Sugar Regulatory Administration (SRA)  | Philippine Sugar Research Institute, Foundation Inc. (PHILSURIN)    | Direct beneficiaries are the women and men sugarcane researchers, breeders, planters, millers, traders, large and small enterprises that are dependent on sugar (e.g. soft drinks, various fruit drinks, food products, cottage industries that use sugar), and industries dependent on the sugarcane plant (e.g. ethanol plants). However, indirect beneficiaries include biofuel and power generation.  | 01-Oct-24 | 30-Sep-27 | ONGOING                          | 5,000,000          | 2,165,670.00     |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---------------|--|---|--|---|--|---|-----------|-----------|----------------------------------|--------------------|------------------|
|               | Geographic Distribution and Genetic Diversity Analysis of <i>Ralstonia solanacearum</i> Phytopt II causing Banana Buggot in the Philippines Using Next Generation Approaches   | Poverty reduction and empowerment of the poor and vulnerable              | Buggot is a disease of cooking bananas caused by the bacterium <i>Ralstonia solanacearum</i> Phytopt II. The disease is endemic to the Philippines, causing huge economic losses in the country's Taro Sabo industry. The latest map of Buggot in the Philippines dates back to 1980. However, due to the recent occurrences of the disease in several areas where it was previously unreported, this project aims to determine its up-to-date distribution in the country. Similarly, it will also update existing knowledge on the genetic diversity of the Buggot pathogen. As earlier studies have mainly focused on strains from Visayas and Mindanao, the proposed project will include populations from Luzon. In addition, this will also utilize more advanced molecular approaches including DNA sequencing technology, and will examine whole-genomic and extrachromosomal DNA, in order to generate more information. Whole genome of three isolates of the Buggot pathogen from the main islands of the country will also be sequenced. These will be used to design PCR primers for the rapid detection of <i>R. solanacearum</i> causing Buggot in the Philippines.   | 1 IEC material on Buggot<br>One (1) peer-reviewed article published in a scientific journal<br>Patent: N/A/Product: N/A/People:<br>One (1) thesis student anchored to the project<br>Training on the diagnosis, detection, and management of Buggot (Target number of participants: 20)<br>Place: N/A/Policy:<br>Policies on the safe movement and trade of bananas between localities in the country<br>Policy recommendation on the control and management of Buggot  | University of the Philippines Los Baños (UPLB)   | Banana growers<br>Agricultural officers/technicians<br>Non-government organizations<br>Researchers<br>Students  | 01-May-24 | 30-Apr-26 | ONGOING                          | 5,000,000          | 2,943,500.03     |
|               | Integrated Crop Management (ICM) for the Rehabilitation of Banana in a Coconut Inter cropping Production System [Old Title: Deployment of Coconut-Banana Inter cropping Technology (DECOBANIT)]  | Integrity of the environment and climate change adaptation and mitigation | The project will validate an on-farm integrated crop management (ICM) package to rehabilitate banana under coconut intercropping production system. Additionally, the project will use mobile applications generated from the SARA Project (Sustainable Resource Assessment and Advisory and Banatex (harvest date estimator) as part of the ICM for Banana. The use of unmanned aerial vehicle (UAV) for crop growth and health monitoring will also be explored in the project.  | Publication: Publication: At least one publication on a peer-reviewed, internationally abstracted journal (Y2/Patent: N/A/Product: An image database of Lakanan and sabardaraba banana growth stages (Y2/People: 1 MS GREAT SCHOLAR<br>Capacity building in Farmer Cooperatives and LGU-'s (Y1) Place: LGU-'s and Farmer Cooperatives/Policy: A policy brief of the application of BananaTech for crop insurance (Y2)   | University of the Philippines Los Baños (UPLB)   | Banana/Coconut Farmers, Banana Traders and LGUs Quezon and Laguna   | 01-Jul-22 | 30-Sep-24 | COMPLETED                        | 4,784,836          | 497,604.24       |
|               | Integrating Wild Species for Sugarcane Varietal Improvement, Advancing Genetic Diversity and Crop Sustainability   | Rapid, inclusive and sustained economic growth                            | Climate change poses significant challenges to sugarcane production in the Philippines. Prolonged dry periods, extensive rainy season, more virulent pests and diseases are among the reasons for the low productivity of local cane varieties. In addition, the threats of a narrow genetic base of the local bred varieties include the inability of the varieties to face the challenge of a changing environment.&nbsp;The use of wild relatives is a common practice in the improvement and breeding of the genetic base of sugarcane. This project aims to develop new hybrids with desirable traits transmitted from the wild like the vigorous growth, rooting ability, and tolerance to biotic and abiotic stresses. Agro-morphological traits of new hybrids produced will be characterized and evaluated.&nbsp;Hybrids will be examined cytologically.&nbsp;Selected promising hybrids from this project with potential as parental source in the improvement of local-bred variety will be added in the collections and used in the breeding program of PHILSURN.  | Publication: One (1) published scientific paper/Product: Thirty (30) F1 hybrids from the fl crosses: S. officinarum x S. spontaneum, and S. officinarum x Pennisetum purpureum, and ten (10) promising BC1 hybrids from the fl crosses: S. officinarum x (S. officinarum x S. spontaneum), and&nbsp;S. officinarum x (S. officinarum x Pennisetum purpureum)/People and Services: Four (4) technical staff trained on breeding techniques, agro-morphological characterization and cytological examination of the new hybrids produced and parental crosses, and 1 BSMS student will assist/support the cytology part of the project/Places and Partnerships: Collaboration between PHILSURN and UPLB through Memorandum of Understanding   | Philippine Sugar Research Institute, Foundation Inc. (PHILSURN)  | The target beneficiaries of this project are women and men breeders, researchers, sugarcane growers, millers, traders, small and large enterprises that are dependent on sugar  | 01-Oct-24 | 30-Sep-27 | ONGOING                          | 5,000,000          | 1,962,117.00     |
|               | Integration of Coconut-based Farming System for Increased Farm Productivity and Profitability in Sibutu Tawi-Tawi  | Integrity of the environment and climate change adaptation and mitigation | The project aims to establish a coconut-based demonstration farm in Tawi-Tawi using Outstanding Open-Pollinated Varieties (OPV) of coconut and market-driven intercrop. The demonstration farm will collect/develop the fl (S) dwarf and tall populations mainly utilized in the mass production of PCA-recommended and NSIC-registered coconut hybrids. A critical part of the establishment involves the method with which the planting materials are produced. The coconut-based demonstration farm will be established in a manner that will produce true-to-type planting materials and near genetically identical to the original populations so that these populations will be performing as expected. To materialize this, matured seedpods will be harvested from the selected palms in the middle of the plantations, one or two rows away from the other coconut populations. Furthermore, integration of coconut farming system technology will be done including intercropping of selected market-driven intercrops to increase farm productivity and profitability.  | Publication: Submit at least one (1) article and/or information materials on coconut-based demonstration farms in peer-reviewed local journals. (Title: Coconut-based Demonstration Farming in Tawi-Tawi: A Sustainable Model for Food Security and Economic Prosperity)<br><br>Product: Establish a 5-hectare demonstration farm with 55 coconut populations of outstanding dwarf and tall open-pollinated varieties (at least 800 seedlings planted); and Recommended suitable and market-driven intercrop with the highest income and benefit to the farmers in Tawi-Tawi.<br><br>People Services: Trained 15 project personnel and 20 coconut farmers and representatives from the LGU of Tawi-Tawi in seednut selection, nursery establishment, farm establishment, coconut farm management, and coconut-based integrated farming.<br><br>Places and Partnership: One (1) Provincial Local Government Unit (PLGU): Tawi-Tawi<br>One (1) PCA Regional Office: BARMM<br><br>Policies: One (1) policy draft on the integration of recommended farming systems and practices for increasing farm revenue and income  | Philippine Coconut Authority - Zamboanga Research Center (PCA-ZRC)   | The beneficiaries of the project are coconut farmers in Tawi-Tawi, agricultural workers in the LGU, researchers on the possible collaboration with a local State University and College (SUC), and coconut stakeholders.  | 01-Jul-23 | 30-Jun-26 | ONGOING                          | 5,000,000          | 969,614.00       |
|               | Interlaboratory Pulping and Paper Making Analysis of BANDALA (Backcross Abaca with Native and Desirable Accessions to Lift Up the Abaca Industry) Abaca Hybrid [Old Title: Inter-Laboratory Pulping and Paper Making of BANDALA (Backcross Abaca with Native and Desirable Accessions to Lift Up the Abaca Industry) Abaca Hybrid] | Integrity of the environment and climate change adaptation and mitigation | Paper is one vital commodity to human needs and activities. With the previous studies on the properties of BANDALA variety, investigating further the potential of the said variety could significantly contribute to paper development. Thus, addressing one major problem of our paper mills which is the lack of source of good fibers.   | Publications: One(1) technical paper<br>Products/Technology Generated: Technical information on pulping process for pulping abaca hybrids<br>People and Services: Abaca producers/farmers and abaca pulp mills  | DOST-Forest Products Research and Development Institute (DOST-FPRDI)   | abaca producers/farmers, abaca pulp mills, academe and the general public   | 01-Aug-23 | 31-Jan-25 | ONGOING                          | 4,869,137          | 802,849.00       |
|               | Participatory Management of Leaf and Root Feeding Beetles Through Semiciochemical-Based Trapping and Entomopathogenic Fungus   | Rapid, inclusive and sustained economic growth                            | A project that generally aims to develop bait and release systems for entomopathogen-infected beetles for the management of different leaf and root-feeding beetles attacking vegetables.  | Publication: One journal publication on pheromone of leaf and root feeding beetles/One journal publication on entomopathogens of leaf and root-feeding beetles/One popular publication on pheromone trap design/One journal publication on the biology and ecology of leaf-feeding beetles<br><br>One guidebook on the use of semiochemicals and entomopathogens/Patent: Utility model for at least 2 beetle kairomone/aggregation pheromones extracted, isolated, and characterized&nbsp;Product: At least 2 beetle kairomone/aggregation pheromones produced<br><br>At least 2 entomopathogens package/People: At least 25 farmers benefited from the technologies developed/Place: 3 implementing institutions<br><br>At least 3 farms in CALABARZON   | Bureau of Plant Industry - Los Baños National Crop Research Development and Production Support Center (BPI-LBNCRDPSC), DA Region 4A, De La Salle University - Laguna (DLSU-Laguna) | Farmers<br>Agricultural Technicians<br>Researchers<br>Students<br>Industries manufacturing biocon agents  | 01-Feb-24 | 31-Jan-26 | ONGOING                          | 5,000,000          | 2,499,932.00     |
|               | Transcriptome Analysis of Philippine Mangoes in Response to Anthracnose and Cecid Fly Damage   | Poverty reduction and empowerment of the poor and vulnerable              | This project proposal primarily aims to identify candidate genes associated with anthracnose and cecid fly resistance in Philippine C Carabao™ mango using RNA-seq technology, and develop molecular markers for marker-assisted breeding. The traditional breeding program for mango is slow and challenging, and molecular tools can facilitate varietal improvement and increase breeding efficiency. This project will use RNA-seq technology to identify the underlying molecular mechanisms and genes involved in disease and insect resistance traits that significantly affect the postharvest fruit quality of C Carabao™ mango. The project aims to generate a large dataset of expressed genes in selected accessions to provide a comprehensive picture of the molecular mechanisms involved in mango fruit development and ripening. The knowledge generated will provide valuable information for molecular marker development, enabling mango breeders and researchers to develop new varieties with improved fruit quality and resistance to a specific pest and disease, which is a top priority for the Philippine mango industry. Overall, the study will contribute to a better understanding of the molecular mechanisms involved in fruit development and ripening, which is relevant not only to mango but also to other fruit crops. | Publications: At least 1 poster/one paper per year<br>One journal article on the screening of eggplant genotypes with high microscope embryogenic response using established in vitro anther isolated microscope culture protocols for the generation of haploid/doubled haploids.<br>One journal article on the phenotyping app used to characterize microspores<br>One journal article on the characterization of at least one candidate gene (DMP) and the effect of CRISPR/Cas-mediated knock-out on these genes.<br>Patent:<br>Appropriate IPR (copyright) for apps for phenotyping of microscope developmental stages in various eggplant germplasm.<br>Appropriate IPR for the Haploid Inducing, RUBY Expressing, Dicycylodexonous (HRED) Crop System.<br>Product:<br>Haploid/doubled haploid eggplant line<br>A haploid inducer line for eggplant<br>People:<br>At least three (3) graduates of at least BS level, trained in computer science, plant tissue culture, plant transformation, and molecular biology and biotechnology<br>Place:<br>Prospective consultancy from Dr. Jose M. Segura-Simarro, a professor from Universitat Politècnica de València (Polytechnic University of Valencia) in Spain, and author of numerous papers related to eggplant doubled haploids<br>Policy:<br>Information and products generated from the project will be presented to contribute in the discussions and policy decisions on products of New Breeding Techniques (such as CRISPR/Cas genome editing), and breeding programs of local institutions.     | University of the Philippines Los Baños (UPLB)   | Researchers<br>Breeders<br>Plant Scientists/Botanists<br>Students   | 01-May-24 | 30-Apr-26 | ONGOING                          | 4,999,960          | 3,494,145.23     |
|               | Utilization of Interdisciplinary Strategies and Plant Breeding Innovations for the Development of Eggplant ( <i>Solanum melongena</i> L.) Haploid and Doubled Haploid Lines  | Poverty reduction and empowerment of the poor and vulnerable              | A project that will develop eggplant haploid and doubled haploid lines through plant breeding innovations involving in silico, in vivo and in vitro techniques.  | Publication:<br>At least one poster/one paper per year<br>One journal article on the screening of eggplant genotypes with high microscope embryogenic response using established in vitro anther isolated microscope culture protocols for the generation of haploid/doubled haploids.<br>One journal article on the phenotyping app used to characterize microspores<br>One journal article on the characterization of at least one candidate gene (DMP) and the effect of CRISPR/Cas-mediated knock-out on these genes.<br>Patent:<br>Appropriate IPR (copyright) for apps for phenotyping of microscope developmental stages in various eggplant germplasm.<br>Appropriate IPR for the Haploid Inducing, RUBY Expressing, Dicycylodexonous (HRED) Crop System.<br>Product:<br>Haploid/doubled haploid eggplant line<br>A haploid inducer line for eggplant<br>People:<br>At least three (3) graduates of at least BS level, trained in computer science, plant tissue culture, plant transformation, and molecular biology and biotechnology<br>Place:<br>Prospective consultancy from Dr. Jose M. Segura-Simarro, a professor from Universitat Politècnica de València (Polytechnic University of Valencia) in Spain, and author of numerous papers related to eggplant doubled haploids<br>Policy:<br>Information and products generated from the project will be presented to contribute in the discussions and policy decisions on products of New Breeding Techniques (such as CRISPR/Cas genome editing), and breeding programs of local institutions. | University of the Philippines Los Baños (UPLB)   | Public and private sector institutions - academic and research institutes, enterprises involved in the eggplant industry<br>Eggplant researchers - plant breeders, geneticists, molecular biologists<br>Students interested in plant breeding, tissue culture, floral biology, plant transformation<br>Farmers and consumers - long-term beneficiaries of improved varieties with shortened breeding periods. | 01-May-24 | 30-Apr-26 | ONGOING                          | 5,000,000          | 1,395,184.66     |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---|---|--|--|--|---|--|-----------|-----------|----------------------------------|--------------------|------------------|
|   | Utilization of Queen Pineapple (Ananas comosus L. var. "Queen") Leaf and Leaf Fiber Waste for High Value Products | Poverty reduction and empowerment of the poor and vulnerable | The pineapple leaf fiber (PALF) from a variety commonly grown in Costa Rica, Brazil, Thailand, Indonesia are processed for composite application. In such case, this study is to assess the potentials of our Queen Pineapple variety for industrial use and composite applications to explore and develop products that can create sustainable livelihood to our farmers.   | <p>Publication: 3 Publications</p> <ol style="list-style-type: none"> <li>1. Characterization of OPALF for plant-based leather production</li> <li>2. Intensified usability of OPALF-based leather</li> <li>3. Sustainable production and storage of OPALF-based products</li> </ol> <p>Products:</p> <ol style="list-style-type: none"> <li>1. anti-bacterial/ anti pathogenic treated non-woven fiber sheets</li> <li>2. intensified OPALF-based leather</li> <li>3. prototype products using OPALF-based leather</li> </ol> <p>People Services:</p> <ol style="list-style-type: none"> <li>1. Two (2) undergraduate thesis on Mechanical and Chemical characterization of OPALF</li> <li>2. Two (2) Farmers Training on OPALF-based non-woven product production</li> </ol> <p>Places and Partnership:</p> <ol style="list-style-type: none"> <li>1. Four (4) MOA signed with LGU, Farmers cooperative, QP growers, Fiber Industry.</li> </ol> <p>Policy:</p> <ol style="list-style-type: none"> <li>1. Circular Economy for QP: Production of OPALF for industrial use</li> </ol> <p>Patent:</p> <ol style="list-style-type: none"> <li>1. Intensified OPALF-based leather</li> </ol>  | Camarines Norte State College (CNSC)                  | QP Farmers, Investors, Researchers, Students, Fiber industry, Textile Industry, Leather industry   | 01-Jul-24 | 30-Jun-26 | ONGOING                          | 5,000,000          | 2,886,000.00     |
| Boosting the Taro Industry and Indigenous Crops of the Bicol Region   | Project 1. Survey, Collection, and Characterization of the Indigenous Crops in Region 5                           | Rapid, inclusive and sustained economic growth               | As a component project of the program on Boosting the Indigenous Crops Industry of Bicol Region that will focus on survey, collection, characterization of indigenous plants from the different provinces in the region. Collected indigenous plants will be conserved in the germplasm facility of CBSUA. These plants will be used as parentals of future initiatives that will involve varietal development.  | <p>Publications: Publication of 10 popularized pamphlets, 2 articles</p> <ol style="list-style-type: none"> <li>1 paper presentation</li> </ol> <p>Products: At least 5 indigenous crops for Project 3</p> <p>People Services- 1 training</p> <p>Places and Partnership- IPs, taro producers, OA practitioners</p> <p>Patents: pamphlets copyrighted/ISSN</p> <p>Social Impact: Increased utilization of indigenous crops</p> <p>Provide additional healthy food for consumption by local communities</p> <p>Economic Impact: increase production and yield of taro and indigenous crops</p> <p>Increase income of farmers</p> <p>More products for commercialization</p>  | Central Bicol State University of Agriculture (CBSUA) | Taro farmers and processors, Indigenous crops growers  | 01-Mar-23 | 28-Feb-25 | ONGOING                          | 3,313,395          | 1,161,379.60     |
| Boosting the Taro Industry and Indigenous Crops of the Bicol Region   | Project 2. Sustainable Production Technology for Taro (Colocasia esculenta) Leaves and Corms                      | Rapid, inclusive and sustained economic growth               | This project will focus on the evaluations of taro local selections in the Bicol region for both leaf and corm production following the NSIC protocols. All accessions that will be collected from various parts of the region will be deposited to Plant Genetic National Plant Genetic Resources laboratory for germplasm repository. Improvement of the fertilization and pest control of taro. Promotion of the technology through audio-visual development, participation in trade fairs and conduct farmers will ensure additional income among the taro growers. This taro project will be a component of the Taro Center for CBSUA in order to continue the research, extension and development activities on this specific root crop.   | <p>Publication: Developed a sustainable production schemes for taro leaves and corms, conducted chemical and physical properties of taro corm starch grown in different cropping method</p> <p>Patent: Conducted multination trial of potential cultivars for NSIC registration</p> <p>Product: IEC materials on the products developed for dissemination</p> <p>People: Stakeholders - rural and urban dweller</p> <p>Place: Established germplasm collection, demo farms and morphological characterizations of local/tender cultivars</p> <p>Other SUCS: International Organizations, NCP/PP/Policy: Conservation of germplasm</p>  | Central Bicol State University of Agriculture (CBSUA) | Taro leaves / laing processors, Taro farmers, students, New entrepreneurs, Science community and food industry.  | 01-Mar-23 | 28-Feb-25 | ONGOING                          | 4,780,944          | 1,716,794.00     |
| Boosting the Taro Industry and Indigenous Crops of the Bicol Region   | Project 3 Utilization, and Product Development of Selected Indigenous Crops in Region 5                           | Rapid, inclusive and sustained economic growth               | This study will focus mainly on the documentation, development and utilization into food products using taro and selected indigenous crops found in the Bicol Region. &nbsp;sp;  | <p>Publication: Publications: Results of this project will be transformed into publishable materials for publication still, subject to IP registration for proper protection and handling of intellectual outputs</p> <p>Patent: Any process or outputs from this research will be subjected to IP registration as patent, utility model or copyright as how the gathered information will be documented</p> <p>Product: For Taro leaves, the thermally processed product will be produced identifying suitable taro leaves variety and the drying characteristics of the taro variety while for taro corms, extraction method, formulation and processing of taro milk will be explored. This plant based product will be appreciated by the health conscious consumers. Indigenous crops will be subjected to determination of its drying parameters and suitability to food application as flour, powders or additives. These outputs will be used in the production of bakery goods, snacks, flavoring and ready-to-eat items</p> <p>People Services: The intended beneficiaries of this project will be benefited through increase of their knowledge on the consumption of these crops to food, create livelihood, increase the utilization of these commodities, and establish protocols for food processing</p> <p>Place and Partnership: The study as to the collection and production, will be conducted mainly in Camarines Sur. Sourcing of these raw materials will be done in nearby municipalities of Camarines Sur and Bicol region depending on availability of these commodities</p> <p>Policy: The project will propose possible and applicable protocol for handling these indigenous crops on the processing into food products</p> | Central Bicol State University of Agriculture (CBSUA) | rural farmers and settlers community researchers business enthusiasts  | 01-Mar-23 | 28-Feb-25 | ONGOING                          | 3,076,298          | 1,200,718.80     |
| Entomopathogenic Fungi as Biocontrol Agents Against the Aphid Vector Pentatonia nigronervosa Coquerel to Manage the Abaca Bunchy Top Disease in Eastern Visayas | Pilot testing of Lecanicillium sp. as a biological control agent against the abaca aphid Pentatonia nigronervosa  | Rapid, inclusive and sustained economic growth               | The abaca bunchy top has been prevalent in several municipalities in the provinces of Biliran, Leyte, and Southern Leyte since 2005, making it unproductive and reducing the earnings of abaca farmers. Given that there are currently no registered resistant varieties, managing the vector is imperative to increase production. The use of insecticides may be feasible, but the harmful effects of synthetics are noticeable. Another control measure is the use of biocontrol agents, particularly entomopathogens. The use of locally cultured Lecanicillium sp. (white halo fungus) for aphid control is effective against abaca aphids under VSU conditions. This project proposal aims to mass produce and evaluate their efficacy against abaca aphids in various field conditions in Biliran, Leyte, and Southern Leyte. Within the second year of the project's implementation, organized farmer leaders will be trained in the production of Lecanicillium sp. The proposal also aims to produce a formulated Lecanicillium sp. The ultimate objective of this initiative is to increase abaca fiber output in the region and across the country by employing an effective biological approach to manage abaca aphids, that transmit the dreaded bunchy top virus. | <p>Publications</p> <ol style="list-style-type: none"> <li>100 Techno Guide on mass production of Lecanicillium sp. (50 leaflets; 50 brochures) distributed in Cebuano (10 copies), Waray (10 copies), English (10 copies), respectively.</li> <li>100 IEC Materials on Lecanicillium sp. as biological control for abaca aphid (50 leaflets; 50 brochures) distributed in Cebuano (10 copies), Waray (10 copies), English (10 copies), respectively.</li> <li>1 promotional Video, and</li> <li>2 scientific papers submitted in peer-reviewed journals.</li> </ol> <p>Patents/IP</p> <ol style="list-style-type: none"> <li>(1) Submission of IPK application for the formulated product and</li> <li>(1) copyright application of IEC</li> </ol> <p>Products</p> <ol style="list-style-type: none"> <li>50 packs (100g) powdered form of Lecanicillium sp.</li> <li>3 established demo farms</li> </ol> <p>People Services</p> <ol style="list-style-type: none"> <li>25 Abaca farmers</li> </ol>   | Visayas State University (VSU)                        | Abaca farmers and leaders, Local fiber technician in Biliran, Leyte, and Southern Leyte Province, Researchers, Students (Integration in module for the topic beneficial microorganism) | 01-Sep-23 | 31-Aug-25 | ONGOING                          | 4,432,423          | 1,533,659.50     |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|--|---|--|--|--|--|---|-----------|-----------|----------------------------------|--------------------|------------------|
| Entomopathogenic Fungi as Biocontrol Agents Against the Aphid Vector <i>Pentalonia nigronervosa</i> Coquerel to Manage the Abaca Bunchy Top Disease in Eastern Visayas | Survey and Assessment of Entomopathogens Against the Aphid Vector <i>Pentalonia nigronervosa</i> of Abaca Bunchy Top Virus in Eastern Visayas   | Rapid, inclusive and sustained economic growth | The abaca bunchy top has been prevalent in several municipalities in the provinces of Biliran, Leyte, and Southern Leyte since 2000, making it unproductive and reducing the earnings of abaca farmers. Given that there are currently no registered resistant varieties, managing the vector is imperative to increase production. The use of insecticides may be feasible, but the health effects of synthetics are noticeable. Another control measure is the use of biocontrol agents, particularly entomopathogens. Given the minimal number of studies on entomopathogens against abaca aphids and their potential applications, this project proposal was undertaken: Survey, collection, and identification of potential entomopathogens suppressing abaca aphids will be assessed as part of this research proposal. The effectiveness of the isolated and identified putative entomopathogens will be validated in laboratory and greenhouse conditions. An IEC material will be developed during the 4th quarter of implementation to indicate its potential application against aphids. The ultimate objective of this initiative is to increase abaca fiber output by at least 10% in the region and across the country by employing an effective biological approach to manage abaca aphids, that transmit the dreaded bunchy top virus. This initiative was undertaken as well as part of the proponent's GREAT re-entry proposal.  | Publications<br>100 copies of IEC Materials on priming entomopathogens and its applications against aphids (50 leaflets, 50 brochures<br>< 25 copies in Cebuano; 15 copies in Waray and 10 copies in English, respectively)<br>(1) promotional site<br>1 technical paper submitted in peer-reviewed journals<br><br>Patents/IP<br>1 UM Application<br><br>Products<br>1. pure culture of entomopathogen ready for formulation<br><br>People Services<br>1. 25 abaca farmers  | Biliran Province State University (BIPSU)  | Abaca farmers through awareness and information drive.<br>Graduating students through thesis mentoring. Local fiber technician in Biliran Province. Students (integration in module for the topic beneficial microorganism).  | 01-Sep-23 | 31-Aug-24 | COMPLETED                        | 2,015,780          | 2,015,759.50     |
| Harnessing Abaca Genetic Resources: Integrating Molecular Strategies for Pest Management, Drought Resiliency, and On-site Detection Assays                             | Project 1. Profiling, genetic, and functional analysis of abaca ( <i>Musa textilis</i> Nees) responses to drought and bunchy top disease stresses   | Rapid, inclusive and sustained economic growth | This study will address research gaps in abaca agronomy which are vital for advancement of abaca agriculture. Profiling of responses of abaca varieties and accessions to disease and  | Publications 6* at least 3 publications in refereed journal. 1 IEC material in the form of manuals or pamphlets<br>Patent/Intellectual Property 6*<br>Product/Technology Generated: Abaca accessions/varieties with resistance/tolerance to drought and<br>ABTV, BBTV and BBIMV. Identified genes for resistance/susceptibility to drought, ABTV, BBTV and BBIMV for new breeding innovations.<br>People 6* at least 3 people trained in molecular biology and plant virology techniques<br>Place and Partnership 6* Collaboration with IUP-MIMBB<br>Policy: At least 1 draft policy recommendation for abaca health certification<br>The sequencing and development of DNA fingerprints for abaca will pave the way to the revision of the antiquated policies on germplasm conservation and exchange. These include prioritization of stress-tolerant abaca for commercial propagation and expansion of abaca planting areas using identified drought-resilient varieties.&nbsp;.&nbsp;.&nbsp;.  | Department of Agriculture - Philippine Fiber Industry Development Authority (DA-PhiFIDA) | Researchers and breeders<br>Abaca farmers<br>Regulatory agencies<br>Industry stakeholders (GBEs, traders)   | 01-Oct-24 | 30-Sep-27 | ONGOING                          | 10,847,402         | 2,572,272.00     |
| Harnessing Abaca Genetic Resources: Integrating Molecular Strategies for Pest Management, Drought Resiliency, and On-site Detection Assays                             | Project 2. Detection, characterization, and race identification of <i>Fusarium oxysporum</i> f. sp. cubense, and the response of selected abaca accessions to the causal organism of abaca wilt | Rapid, inclusive and sustained economic growth | To develop a comprehensive strategy for the identification, on-site detection, and evaluation of abaca responses against the causal pathogen for abaca <i>Fusarium</i> wilt  | Publication: Patent: Product: People: Place: Policy:   | Department of Agriculture - Philippine Fiber Industry Development Authority (DA-PhiFIDA) | Researchers and breeders<br>Abaca farmers<br>Regulatory agencies<br>Industry stakeholders (GBEs, traders)   | 01-Oct-24 | 30-Sep-27 | ONGOING                          | 10,404,527         | 2,420,165.00     |
| Harnessing Abaca Genetic Resources: Integrating Molecular Strategies for Pest Management, Drought Resiliency, and On-site Detection Assays                             | Project 3. Development, packaging, and validation of a portable and ultrasensitive genotyping assay for identification of abaca ( <i>Musa textilis</i> Nees) varieties                          | Rapid, inclusive and sustained economic growth | To develop, package and validate a portable genotyping assay for abaca varietal identification and fiber-source authentication   | Publication: Patent: Product: People: Place: Policy:   | Department of Agriculture - Philippine Fiber Industry Development Authority (DA-PhiFIDA) | Researchers and breeders<br>Abaca farmers<br>Regulatory agencies<br>Industry stakeholders (GBEs, traders)   | 01-Oct-24 | 30-Sep-27 | ONGOING                          | 10,408,612         | 2,344,896.00     |
| N/A  | Mining the Diversity of Philippine Traditional Rice Varieties through Whole Genome Sequencing and Bioinformatics  | Rapid, inclusive and sustained economic growth | This project is one-half of a research program which aims to obtain the phenotypes and genome sequences of 1000 Philippine traditional rice varieties (TRVs). The project will strongly leverage the genetic resources locked in Philippine TRVs, with state-of-the-art genomic and computational technologies. The genome information will be used to identify the uniqueness of the Philippine TRVs, find similarities and variations, and look for novel traits and genes. Moreover, the genomic data will be used by the other project in the program, to associate the genetic variants with specific traits. The traits of interest are herbicide tolerance, earliness, low phytic acid, micronutrient-dense rice, high-quality protein rice, and anaerobic seed germination. The project will lead to the identification of rice accessions which can be used as donor parents or be sources of novel alleles for rice improvement programs. Eventually, this may result in the development of rice cultivars that are more nutritious and resilient to the effects of climate change.<br><br>&nbsp;.&nbsp;.&nbsp;.<br><br>In addition to genome sequencing of 1000 TRVs, a reference genome specifically of the economically important variety (Dinorado) will be assembled and annotated using available literature and RNA sequencing data that will be obtained from this project. The variation at the single nucleotide level across the rice genomes will be determined. The large amounts of data that will be generated will be stored and curated in a database that will eventually be made available to the public. Human capacity enhancement will be through the conduct of trainings on various relevant bioinformatic analyses and the development and use of a database.<br><br>&nbsp;.&nbsp;.&nbsp;.<br><br>The project is a collaboration between the Philippine Genome Center (PGC) Sequencing Core Facility, PGC RI&P&D Program on Agriculture, Philippine Rice Research Institute, University of the Philippines Los Baños, and the   | Publications<br>At least eight high quality research paper(s) in peer-reviewed journals<br>IEC materials for the training modules (publication and video)<br><br>Patents/IP<br>NA<br><br>Products<br>1.&nbsp;&nbsp;. Production of Dinorado standard reference genome with annotation<br>2.&nbsp;&nbsp;. The Phi Rice GDB created for use by breeders and researchers<br>3.&nbsp;&nbsp;. Structural variants and pan genome core and adaptive genes<br>4.&nbsp;&nbsp;. High quality genome variant calls of 1000 traditional rice varieties against multiple reference genomes (e.g., Azucena, IR 64, Nipponbare, and Dinorado)<br>5.&nbsp;&nbsp;. New tools developed that will enhance the existing Application Programming Interface (API) frameworks of SNP-Seek in the Phi Rice GDB   | University of the Philippines Los Baños (UPLB)   | 1. Academic and research institutes ICT 6* Strengthened bioinformatics capacity for the maintenance and continuous development and curation of the Phi Rice GDB.<br><br>2.&nbsp;&nbsp;. Faculty and students 6* Materials in teaching crop genomics, bioinformatics, and computer science/software engineering courses. Will provide a platform for great actor/ experiential learning of students, i.e., through internships and thesis studies.<br><br>3.&nbsp;&nbsp;. Researchers, breeders, academic, and students 6* Identification of genes/genomic regions and annotations of these for genome to phenotype trait discovery<br><br>4.&nbsp;&nbsp;. Farmers as ultimate beneficiaries. These bioinformatic resources will accelerate the development and delivery of improved varieties by rice breeders, enabling farmers to obtain higher yields with improved varieties. | 01-Aug-24 | 31-Jul-27 | ONGOING                          | 62,920,352         | 19,672,495.00    |
|  | 3D Printing Using ITPS-Derived Lignocellulosic Biomaterials (IPPS3D)  | Rapid, inclusive and sustained economic growth | &nbsp;.&nbsp;.&nbsp;. The planting of industrial tree plantation species (ITPS) is desirable from both an environmental and economic standpoint. ITPS provide cover to degraded uplands and enable farmers to earn income from their planting and harvesting upon maturity. However, timber grown in plantations are less favored by local wood processors because of their preference for wood from natural stands, both as a matter of familiarity with their properties and because customers still continue to demand products from natural timber. Thus, ITPS timber do not command a high price as naturally-grown timber when sold in traditional markets. Also, owing to the poorer form and smaller size of ITPS timber, their processing generates more wastes than large-diameter, naturally-grown timber. There is, therefore, a need to harness these wastes in order to realize more value per cubic meter of the material.&nbsp;.&nbsp;.&nbsp;. The project will explore the utilization of nanocellulose and lignin from ITPS as IPPS3D filaments for 3D printing. With inherent biocompatibility and tunable properties, lignocellulosic materials are being considered as promising materials for use in the rapidly emerging field of 3D-printed biomaterials (Lu et al. 2019a; Zama et al. 2021). Biocomposite preparation by 3D printing is expected to see tremendous commercial growth. The global 3D printing market size is expected to grow USD 12.6 billion in 2021 to USD 34.8 billion by 2026, at a CAGR of 22.9% (Report Linker 2021).<br><br>&nbsp;.&nbsp;.&nbsp;. Indeed, 3D printing offers new and exciting opportunities in utilizing the waste from ITPS processing, considering the possibilities of deriving new wood-based products and obtaining products modified with wood-derived materials capable of enhancing product quality and performance. The development of these products, which could meet the demands of a wide array of industries. IPPS3D will generate greater value for these resources. The establishment of the potential of nanocellulose and lignin from ITPS for 3D printing applications may translate to expanded market opportunities | Publications: One (1) IEC material, i.e., information bulletin/brochure about the extraction of cellulose and lignin using a new method and its potential. A, for the production filaments for 3D printing.&nbsp;.&nbsp;. Drafts of two (2) scientific articles submitted for publication in peer-reviewed journal.&nbsp;.&nbsp;. Treatise for IPPS3D.A.<br>One (1) invention disclosure application for the developed protocol for the production of and the IPPS3D filaments.<br>One patentability model for the developed protocol for the production of the IPPS3D filaments<br>A. Product: Protocols for the extraction of lignocellulosic material from ITPS and production of IPPS3D filaments; IPPS3D filaments with optimized properties;<br>3D-printed products<br>A. People: One (1) graduate/undergraduate student with thesis on 3D printing using IPPS3D filaments.<br>One (1) technical personnel trained.&nbsp;.&nbsp;. Place: One (1) partnership with ITPS plantation owners/farmers or ITPS processing plant or the Additive Manufacturing Center (AMCen) in the form of MOU or MOA.<br>Improvement of the FPS Forest Bio-Materials Research Laboratory: Policy: NA | University of the Philippines Los Baños (UPLB)   | The target beneficiaries of this project are forest-based industries using ITPS. A, tree plantation farmers, A, 3D printing industry, other related downstream industries and consumers who are willing to use sustainable and environmental-friendly products.   | 01-Apr-23 | 31-Mar-25 | ONGOING                          | 4,999,999          | 1,367,978.16     |



| 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, 2024 | Total Project Cost | 2024 PCAARRD GIA |
|---------------|--|---|--|--|--|---|-----------|-----------|---------------------------------|--------------------|------------------|
|               | Application of eDNA Metabarcoding in Faunal Biodiversity Assessment of Indo-Pacific Mangroves Vulnerable to Climate Change: Philippine Node  | Integrity of the environment and climate change adaptation and mitigation | This research project is part of a regional collaborative research submitted to East Asia Science and Innovation Area Joint Research Program, or e-ASIA JRP, a multilateral international joint initiative between a number of public funding organizations of the East Asia Summit (EAS) member countries, including Japan, Indonesia, Philippines, entitled Application of eDNA metabarcoding in faunal biodiversity assessment of Indo-Pacific mangroves vulnerable to climate change, and to other funding agencies for non-e-ASIA member countries (Thailand, South Africa, Malaysia). This collaborative research project for Philippines aims to determine the change in biodiversity of fish and benthic macroinvertebrates in mangrove areas of the country following a standardized biomonitoring tool, that is the aquatic environmental DNA and application of species distribution modeling (SDM). The data and information that will be gathered in the Philippines will be incorporated for analysis on Indo-Pacific mangrove ecosystems through the collaboration. The eDNA approach will serve as a new indicator for evaluating species biodiversity in mangrove ecosystems, incorporating with Species Distribution Model analyses, the study will provide prediction of species distribution under different climate change scenarios and/or environmental conditions. Given the multitude of ecosystem services provided by mangrove ecosystems, it is important to understand their potential responses to global climate change of which faunal biodiversity assessment can provide baseline contribution. Climate change is likely to have a substantial impact on faunal diversity of mangrove ecosystems in the Indo-Pacific, through various impacts resulting from sea level rise (SLR), changing ocean currents, increased storminess, increased temperature, changes in precipitation and increased CO2. These factors are inter-related and spatially variable on inter-regional scales. Challenges in doing biodiversity monitoring can be addressed by application of innovative tool, such as the eDNA. This approach is easy to be standardized across countries, under a system of collaborative work and capacity building. Raw sequence datasets will be produced, which will become reference for annotated species list and distribution models across climate change scenarios. Enhanced environmental awareness, policy guidelines, and scientific reports are also targeted as some of the outputs. | Publications<br>1 project brochure<br>4 publications to national/international indexed journals<br>4 posters of species and/or SDM maps<br>Patent<br>1 copyrighted scientific poster<br>People and Services<br>12 project members trained on eDNA protocols<br>20 LGUs/NGOs technical staff trained on faunal diversity assessment using eDNA<br>4 LGUs with enhanced mangrove conservation strategies through workshops, fora, and/or research involvement<br>4 DOST-PCAARRD GREAT Scholarships<br>4 DOST-SEI undergraduate/graduate scholarships<br>2 project staff and 3 RA capacitated by PGC on the genetic laboratory works<br>1 PhD MEXT (Japanese Government) Scholarship<br>Places and Partnership<br>5 sites of mangrove forests monitored for fish and macrobenthic invertebrates towards biodiversity conservation strategies<br>1 Philippine agencies involved<br>3 International collaborations established<br>5 coastal communities with better appreciation on mangrove ecosystems through community fora and/or participatory data collection<br>2 Collaborations for scholarships: DOST-PCAARRD GREAT and DOST-SEI in collaboration with Japanese University for the MEXT Scholarship<br>Policy<br>1 Policy brief on how eDNA metabarcoding, a noninvasive tool for biodiversity assessment, can revolutionize biomonitoring approach in mangrove ecosystems<br>1 Policy brief on conserving the faunal biodiversity in the mangrove ecosystems<br>1 Policy brief on the importance of networking among researchers and local stakeholders esp. in the growing molecular era of biodiversity assessment/ monitoring<br>Publication<br>At least 1 paper presentation in a conference<br>At least 1 paper presentation in a conference<br>1 IEC materials, 1 promotional video for the promotion of the technology<br>Patent:<br>Copyright for the database and online platform for rubber diseases and insect pests<br>Product:<br>Profile of rubber diseases and insect pests in the Philippines<br>Database for diagnosis of rubber diseases and insect pests<br>Pool of plant doctors for an online rubber clinic<br>Artificial intelligence-based, powered diagnostic clinic and monitoring system<br>Online database platform for information dissemination of rubber diseases and insect pests<br>People:<br>1 undergraduate<br>1 PhD/MS graduate student<br>1 capacity building training to promote the technology for at least 50 rubber farmers<br>Place:<br>Partnership with small scale rubber growers and rubber farmers' associations, DOST, LGU and SUC<br>Policy:<br>Certification of online platform for diagnostic and rubber clinic<br>Protocol for reporting and disseminating information of the observed incidence of rubber diseases and insect pests | Mindanao State University (MSU-Naawan)                 | The target beneficiaries of the project are the following: Mangrove conservation managers from DENR, BFAR, and LGU (Municipal Agriculture Office, Municipal Environment and Natural Resources Office)- Fisheries and local coastal communities- Pool of mangrove and marine biodiversity researchers or networks- SUCs- Early career ocean professionals and technical staff<br><br>- Academic graduate and undergraduate students  | 01-May-22 | 30-Apr-25 | ONGOING                         | 14,937,641         | 3,792,730.36     |
|               | Artificial Intelligence-Based Diagnostic Clinic for Detection and Monitoring System for the Management of Rubber Diseases and Insect Pests   | Integrity of the environment and climate change adaptation and mitigation | This project deals with providing intervention in increasing rubber quality and production, addressing the issue of lack of efficient and effective surveillance, detection, clinic for rubber experts, and monitoring system of rubber disease and insect pests through the development of artificial intelligence-based databases and online platform for information dissemination, diagnostic clinic, and monitoring system for the management for rubber diseases and insect pests. The development of an online database and platform for diagnostic clinic and monitoring systems is based on R&D needs, problems, and gaps identified by DOST, DA-PRRI, PCAF and TWG for the rubber diseases as an output of consultations and discussions in collaboration with SUCs, government agencies. This project is timely and relevant. This technology could have particular benefits to rubber farmers, associations, LGUs, SUCs, researchers, and other rubber stakeholders and could have a great impact from small to large-scale rubber stakeholders in the country. This project will be implemented in major rubber producing provinces in the country. After the project's completion, an artificial intelligence-based centralized database system and online platform for detection clinic, monitoring, surveillance and reporting system of rubber diseases and insects will be developed for the productivity of the rubber industry in the country.   | Publications<br>At least 1 paper presentation in a conference<br>1 IEC materials, 1 promotional video for the promotion of the technology<br>Patent:<br>Copyright for the database and online platform for rubber diseases and insect pests<br>Product:<br>Profile of rubber diseases and insect pests in the Philippines<br>Database for diagnosis of rubber diseases and insect pests<br>Pool of plant doctors for an online rubber clinic<br>Artificial intelligence-based, powered diagnostic clinic and monitoring system<br>Online database platform for information dissemination of rubber diseases and insect pests<br>People:<br>1 undergraduate<br>1 PhD/MS graduate student<br>1 capacity building training to promote the technology for at least 50 rubber farmers<br>Place:<br>Partnership with small scale rubber growers and rubber farmers' associations, DOST, LGU and SUC<br>Policy:<br>Certification of online platform for diagnostic and rubber clinic<br>Protocol for reporting and disseminating information of the observed incidence of rubber diseases and insect pests  | Philippine Rubber Research Institute (DA-PRRI)         | The beneficiaries of this project are the Rubber Farmers, Rubber Cooperatives, LGU, SUC, and SUC, SUCs in SOCCSKARGEN, Zamboanga Sibugay, Davao de Oro, Basilan, Palawan and Negros Oriental and Agusan del Sur.  | 01-Oct-22 | 31-Mar-25 | ONGOING                         | 5,000,000          | 1,051,714.84     |
|               | Assessing the Environmental Footprint of Bamboo Textile Production: A Life Cycle Analysis (LCA) of the Bamboo Textile Fiber (BTF) Innovation Hubs  | Rapid, inclusive and sustained economic growth                            | As consumers increasingly prioritize environmentally friendly products, some businesses may resort to greenwashing to falsely advertise their products' ecological benefits. To prevent this deceptive practice, companies must support their environmental claims with reliable evidence of their product's impact. One effective method for quantifying a product or process's environmental impact is life cycle assessment (LCA), a standardized and systematic approach that evaluates a product's environmental effects throughout its life cycle, from raw material extraction to disposal. Bamboo clothing is a product that is frequently subject to greenwashing. In April 2022, the US Federal Trade Commission (FTC) took action against Kohl's, Inc. and Walmart, Inc. for falsely advertising rayon knitties as bamboo products. Despite bamboo being used as a raw material, bamboo clothing undergoes a highly polluting chemical process similar to viscose, releasing toxic chemicals into the air and waterways. On the other hand, DOST-PTRI produces sustainable and authentic bamboo textile fibers using mechano-chemical processes. To differentiate and quantify the environmental impact of bamboo textile products and processes, an environmental assessment such as LCA is necessary. LCA can help identify areas with the greatest potential to have an adverse environmental impact, such as "hotspots" in the production process. Additionally, LCA can help businesses understand areas for improvement and innovation, potentially setting their products apart from competitors in terms of their environmental impact. Critically evaluating and verifying LCA results can also help businesses avoid or reduce accusations of greenwashing and reduce risks associated with environmental regulations. Overall, incorporating LCA into product development and marketing can help businesses make informed decisions and prioritize sustainability, benefiting both the environment and their bottom line. Furthermore, integrating product traceability, which traces the entire product life cycle from raw material to final products, addresses greenwashing concerns and enhances sustainability efforts.  | Publications Year 1 One (1) Press Release from one of the BTF Innovation Hub for the environmental impact of the produced yarn/textile Year 2 One (1) Technical paper One (1) Press Release from the remaining BTF Innovation Hubs for the environmental impact of the produced yarn/textile One (1) Product/Project Brochure/Abstract Year 2 One (1) copyright /Product Year 1 One (1) Bamboo Textile Fiber (BTF) Innovation Hubs Database Year 2<br><br>One (1) LCA framework for the Bamboo yarn/textile production from the BTF Innovation Hubs/People and Services Year 1 Two (2) persons will be trained on how to perform the LCA analysis Year 2 Three (3) persons will be trained on how to perform the LCA analysis Three (3) persons trained on how to use Bamboo Textile Fiber (BTF) Innovation Hubs database<br><br>One (1) MS graduated/Places and Partnership Year 1 Three (3) collaborative agreement with Bamboo Textile Innovation Hub Partnership with Department of Agriculture Region 11 and 12 Year 2 One (1) Information Bulletin for Policy recommendation on rubber-based farming system One (1) technical journal<br>One (1) Compendium of rubber-based agroforestry systems published<br>Draft information bulletin on rubber-based agroforestry systems for PCAARRD Publication<br>Patent, Not Applicable/Product: Book on Compendium of rubber-based agroforestry systems/People: Graduated 2 MS scholars in agriculture specialized in rubber-based agroforestry and/or agricultural economics<br>50 participants on the Forum of Rubber-Based Agroforestry System<br>Place: At least eleven (11) PLGU coordinated for gathering of secondary data<br>At least seven (7) PLGU coordinated for gathering of secondary data/Policy: One (1) Policy advisory prepared for LGUs/PAO and MAO in improving smallholder rubber farmers productivity by adopting appropriate rubber-based agroforestry for their situation.  | DOST-Philippine Textile Research Institute (DOST-PTRI) | This project aims to establish an environmental assessment scheme for bamboo yarn/textile production, which will have direct and indirect benefits. Through capacity building and the creation of a comprehensive LCA framework, the BTF Innovation hubs will have the necessary knowledge and tools to carry out sustainable and effective environmental impact analysis. This will enable them to identify areas for improvement and opportunities for cost savings, leading to a more sustainable and efficient production process. In turn, this will benefit our local farmers and bamboo suppliers through effective marketing strategies and a more stable demand for their products. Overall, this project will contribute to the development of a more sustainable and circular economy for the Philippine textile industry, while also supporting the livelihoods of our local communities. | 01-Jun-24 | 30-Jun-26 | ONGOING                         | 4,497,791          | 3,020,395.50     |
|               | Assessment of various rubber-based cropping systems for enhanced production of smallholder rubber farmers in different climatic types of the Philippines (Old Title: Assessment of Various Rubber-Based Agroforestry Models/Systems For Enhanced Production of Smallholder Rubber Farmers in Different Climatic Types of the Philippines)                              | Integrity of the environment and climate change adaptation and mitigation | The study on rubber-based cropping systems is in order to address the identified research gap for ISF on rubber and to aligned on the development strategies of Philippine rubber industry which is to expand production and improve plantation/ farm productivity by adopting new technologies and good agricultural practices as well as the intensification of R&D on rubber to improve technology on production (PhilRubber Roadmap 2020-2040). The study aims to increase the income of rubber farmers and address the issue on the decreasing and inconsistent rubber in the market which affects the income of rubber farmers through the rubber-based cropping system (RAS). The study will include documentation and analysis of the current RAS and provide policy recommendations in rubber traditional areas. At the end of the study, book on compendium on rubber-based agroforestry system in different agroclimatic condition will be published and disseminated, and forum will be conducted in order to enhance knowledge of smallholder farmers on this system.   | Publications: Project press releases, brochures and leaflets about the project<br>One (1) Information Bulletin for Policy recommendation on rubber-based farming system<br>One (1) technical journal<br>One (1) Compendium of rubber-based agroforestry systems published<br>Draft information bulletin on rubber-based agroforestry systems for PCAARRD Publication<br>Patent, Not Applicable/Product: Book on Compendium of rubber-based agroforestry systems/People: Graduated 2 MS scholars in agriculture specialized in rubber-based agroforestry and/or agricultural economics<br>50 participants on the Forum of Rubber-Based Agroforestry System<br>Place: At least eleven (11) PLGU coordinated for gathering of secondary data<br>At least seven (7) PLGU coordinated for gathering of secondary data/Policy: One (1) Policy advisory prepared for LGUs/PAO and MAO in improving smallholder rubber farmers productivity by adopting appropriate rubber-based agroforestry for their situation.   | Philippine Rubber Research Institute (DA-PRRI)         | Different rubber stakeholders (rubber farmers, LGUs, NGOs, Research institutions, SUCs, other government agencies etc.)   | 01-Jun-22 | 30-Nov-24 | COMPLETED                       | 4,998,099          | 1,203,174.66     |
|               | Assessment, Nutrient Profiling, and Propagation of Economically Important Terrestrial Snail Species in Selected Key Biodiversity Areas (KBAs) of Cebu Island, Philippines (An Alternative Food Source to Strengthen Food Security amidst Pandemic: Land Snail Farming and Nutrient Profiling of Economically Important Land Snail Species in Cebu Island, Philippines) | Rapid, inclusive and sustained economic growth                            | This study is in support of the NCEP project of CTU-Ayugo Campus on biodiversity assessment of flora and fauna in Cebu Island KBAs. The NCEP project on biodiversity assessment of flora and fauna in Cebu Island has led to the inventory of land snails diversity in the area. Land snails are essential both as bio indicators for rare/lost biodiversity and health status of forest habitat. Its ecosystem services include breaking down and recycling of organic matter, transfer of calcium nutrient to higher trophic levels and as food source for other animals.  | Year 1<br>Pre- and post- services - at least 10 student mentored<br>Places and Partnership - MOA with DA, DENR, Philippine Science High School Region 7 and LGUs, Local Community<br>Year 2<br>Publication- Two (2) articles drafted for publication in ISI-Scopus indexed journal<br>Product - One (1) food formulation with nutrient profile, One (1) unit of micro-museums using Augmented Reality technology, One (1) manual (Technoguide) for terrestrial snail farming<br>Patent- Copyright application for the developed manual (Technoguide) for terrestrial snail farming<br>People and services - Seminar/Workshop on food development using land snails; at least 10 students trained/mentored<br>Places and Partnership - MOA with DA, DENR, Philippine Science High School Region 7, LGUs, local community<br>Policies - One (1) policy recommendation related to the conservation of ecologically and economically important terrestrial snails  | Cebu Technological University (CTU)                    | 1.FARMERS - utilize land snail as another farm product to increase yield and income<br>2.STUDENTS - increase knowledge and awareness of the ecological and economic importance of land snail<br>3.LOCAL COMMUNITIES - embark on a communal land snail farming and protection of habitat.<br>4.LGUs - formulate policies for a comprehensive conservation plan for malacofauna.  | 01-Aug-21 | 31-Jul-24 | COMPLETED                       | 4,998,858          | 826,396.32       |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---------------|---|---|---|---|--|---|-----------|-----------|----------------------------------|--------------------|------------------|
|               | Bamboo ACTIVE Ph: Activated Carbon Through Innovation for the Vulnerable Sectors and the Entrepreneurs in the Philippines | Integrity of the environment and climate change adaptation and mitigation | Bamboo activated carbon from Philippine bamboo species will be used to develop prototype products with industrial applications. Activated carbon from bamboo are used in many applications such as for medicine, food and drinks, cosmetics and personal hygiene. In the Philippines, very little information is known about the use of our local bamboo species for the production of the aforementioned products. This project aims to determine the characteristics of activated carbon from different bamboo species and to develop products for various industrial uses, particularly in disaster-prone areas.   | Publication:<br>Local Publication<br>1 IEC Material (1) 0Brochures, 0Flyers, 0Videos, 0Press releases, news and feature articles (In-media, social media) 0Poster 0Instructional/Training materials/Modules<br>Patent/Intellectual Property:<br>Patent/Utility model application file for bamboo activated carbon (1)<br>Patent/Utility model application file for bamboo activated carbon hygiene products (1)<br>Patent/Utility model application file for bamboo activated carbon water filter (1)<br>Patent/Utility model application file for bamboo activated carbon wound patch (1)<br>Copyright (10) 0Brochures 0Flyers 0Videos 0Press releases, news and feature articles (In-media, social media) 0Poster 0Instructional/Training materials/Modules/Product bamboo activated carbon (50)bamboo activated carbon hygiene products (50)bamboo activated carbon water filter (50)bamboo activated carbon wound patch (50)People and Services Trainings/seminars/workshops conducted/organized (50)pa/Place and Partnership/partner institutions and collaborating partners Project sitesMemorandum of Agreement/Understanding forged | DOST-Forest Products Research and Development Institute (DOST-FPRDI) | Men and women in the disaster-prone areas in the country<br>Bamboo plantation owner, bamboo industry and general public   | 01-Oct-23 | 30-Sep-25 | ONGOING                          | 4,999,408          | 1,106,352.00     |
|               | Bamboo LEAF Ph: Leaf Extracts Active Formulations from the Philippines  | Integrity of the environment and climate change adaptation and mitigation | The Jiangxi Academy of Forestry of the People's Republic of China and the DOST-Forest Products Research and Development Institute of the Republic of the Philippines have reached the agreement to jointly apply the key international operation research and development projects and have agreed on the following areas of cooperation for project application of abamboo charcoal/bamboo-based activated carbon preparation for bamboo industry and bamboo leaf active substance extraction technology in the Philippines. This research aims to develop skincare products using leaf extracts from selected bamboo species in the Philippines. Specifically, the research will focus on extracting and characterizing bamboo leaf polyaccharides, polyphenols, and flavonoids. In addition, the study will also involve prototype product development, evaluation of product effectiveness, assessment of acceptability, cost analysis, and formulation of commercialization strategies.  | Publication:<br>1 local publication for Year 2<br>5 IEC materials for serum and lotion for Year 1 and Year 2 (total of 10 IEC materials)<br>Brochures<br>Flyers<br>Videos<br>Press releases<br>Posters<br>Instructional / training materials / modules and newsletters<br>Patent:<br>1 Patent / UM application filed for serum for Year 2<br>1 Patent / UM application filed for lotion for Year 2<br>1 Patent / UM application filed for process of producing bamboo flavonoids and polyaccharide for Year 2<br>3 Copyright for IEC materials for serum and lotion for Year 1 and Year 2 (total of 10 copyrights of IEC materials)<br>Product:<br>50 pieces of serum for Year 2<br>50 pieces of lotion for Year 2<br>People:<br>Training / seminars / workshops conducted / organized (50) pa/ Place and Partnership/partner institutions and collaborating partners Project sites<br>Established laboratories for Year 1<br>Sino-Philippines Bamboo Research Joint Laboratory<br>Partner institutions and collaborating partner for Year 1<br>Jiangxi Academy of Forestry   | DOST-Forest Products Research and Development Institute (DOST-FPRDI) | Skincare consumers who are interested in eco-friendly and sustainable products—Skincare manufacturers and industry practitioners—Local communities and bamboo farmers who can potentially benefit from the production of bamboo leaf extracts as a value-added product—Government agencies and policymakers who may use the research findings to support sustainable and eco-friendly initiatives in the skincare industry. | 01-Oct-23 | 30-Sep-25 | ONGOING                          | 4,999,816          | 1,136,204.00     |
|               | Bamboo LIQUOR Ph: Local Innovation for Quality Use as Organic Pesticide Resources in the Philippines                      | Integrity of the environment and climate change adaptation and mitigation | This study aims to provide a more sustainable alternative to organic pesticides and help eradicate the infestation of insects, particularly the fall armyworm (cutworm) and onion armyworm (OAW) in local onion farms. A bamboo synthesized liquid (BSL) was developed and validated in the actual farm setting to test its efficacy, commercial potential, and applicability in minimizing the harmful effects of the cutworm and OAW in onion farms. This is in partnership with the Bureau of Plant Industry of the Department of Agriculture (DA-BPI). Production of bamboo PL and pesticide formulation shall be assumed by DOST-FPRDI, which includes laboratory tests and preliminary field verification. In contrast, actual field applications will be implemented by the BPI, particularly the Crop Protection and Management Division (CPMD).  | Publication<br>At least five (5) IEC materials for organic pesticide from bamboo PL (brochures, flyers, video/press releases, instructional and training materials) by the second year of the project<br>Patent/Intellectual Property<br>At least one (1) intellectual property right (patent, or utility model) related to the technology produced and subsequent modification, if necessary, at the end of Year 1<br>Copyright for IEC materials in Year 2<br>Product:<br>Technology package of the bamboo PL for cutworm and OAW in Year 2<br>Pesticide for cutworm and OAW/People and Services<br>At least 10 workers of the identified partner-cooperators shall be trained on how to make and apply the bamboo PL in Year 2/Place and Partnership Agreement with partner cooperators that shall simulate the field conditions of applying the technology in Year 2<br>At least three (3) partner cooperators identified<br>Partnership with Jiangxi Academy of Forestry on separation of tar and P/Established/Policy   | DOST-Forest Products Research and Development Institute (DOST-FPRDI) | Onion farmers<br>Producers/Manufacturers of organic pesticides  | 01-Oct-23 | 30-Sep-25 | ONGOING                          | 4,954,999          | 1,145,240.76     |
|               | Biofunctional Potential of Cocoa Pod Husk and Cocoa Bean Shell for the Fabrication of Bio-based Materials                 | Rapid, inclusive and sustained economic growth                            | The global cocoa supply deficit continues to increase every year. Based on the latest data from the International Cocoa Organization (ICCO), the global supply during the 2023/24 season is expected to further decline, resulting in a higher deficit than previously expected. This market demand incentivizes growers to produce more but certain constraints must first be overcome. These constraints include infestation from pests and diseases that greatly impacts production. The Philippine Cocoa Industry thus created the Philippine Cocoa Industry Roadmap (2018-2025) that updated the 2017 IC2022 Roadmap. The new roadmap contains innovations to realign its vision, mission, goals, strategies and interventions with relevant national and international policies and frameworks including the Agriculture and Fisheries Modernization Act of 1997, the United Nations' Sustainable Development Goals, the Ambisyon Natin 2040, the Philippine Development Plan, and the proposed Philippine Cocoa Industry Development Act. One of these strategies is to promote aggressively value-added products derived from cocoa production. The technologies that will be developed in this project will therefore add to the products that can add value to wastes generated during production.  | Publication: 1Patent: 12Product: 14People: 31Place: 38Policy: 48  | De La Salle University (DSU)   | Cocoa industry including farmers, extension workers, researchers, other stakeholders, and decision makers   | 01-Nov-24 | 31-Oct-28 | ONGOING                          | 5,000,000          | 2,856,503.60     |
|               | Community-based Verification of Fiber Extraction Technology using Local Bamboo Species as a Textile Material              | Integrity of the environment and climate change adaptation and mitigation | Natural fibers have a lot of advantages over synthetic fibers since natural fibers emit low pollutants, lower greenhouse gases emission, and biodegradable. In comparison with other sources of natural fibers, bamboo has a high growth rate and can perform carbon sequestration whereby plants capture carbon from the atmosphere and store in their leaves, stems, branches, and pole during their growth. Several studies showed that bamboo fibers could be reinforced with other composites to further improve the mechanical properties of bamboo fibers. Because of the abundance of bamboo species in the Philippines and its distinctive properties, PTRI develops more environment friendly/processes to extract bamboo textile fibers using previous bamboo species that have been evaluated. The Philippine Textile Research Institute (PTRI) bamboo technology evaluated 12 Philippine Bamboo Species such as Anos (Schizostachyum lima, Blanco, Mer.), Bayog (Bambusa merilliana, Blanco, Mer.), Kawangyang-biting (Bambusa vulgaris, Isolina), Puser (Cyrtochloa puser, s. drapet.), Buhay (Schizostachyum lumampao, Blanco, Mer.), Lank (Bambusa philippensis, sp. 2), Black Bamboo (Gigantochloa aristosissima, Widjaja), Green Buhay (Schizostachyum brachycladum, Kurz), Iron Bamboo (Guadua angustifolia, Kunth), Kayali (Gigantochloa atter, Hassk, Kurz), Mashiku (Dendrocalamus latiflorus, Muroi) and Thailand Bamboo (Thyrsostachy sp. 1). The project implemented last year. Evaluation of different bamboo species for the desired properties such as spinnability, yarn count, fiber recovery, and fiber strength has been a crucial part in investigating which bamboo species is feasible as a textile material. After the assessment of bamboo species, the technology for fiber extraction will be applied at specific farm sites in Northern Luzon.<br><br>This project will verify the fiber processing and extraction at the community level. The same procedure will be conducted such as mechanical extraction, alkali treatment, yarn processing, and weaving of prototype fabrics. PTRI will collaborate with local bamboo farms in Northern Luzon specifically in Pangasinan and Abra. Local farms under consideration include CSR Green Bamboo Factory (Baya-baya, Pangasinan), and in Western Abuyog Farmers Cooperative in Liscan-Babay, Abra where most of the bamboo species are abundant in the province. This will include the engagement of local communities in fiber processing where the members will be allowed to partake and learn the fiber extraction in their respective areas and to grasp information about equipment operations in fiber processing. The results then proceed to the fiber extraction and bench-scale treatment. The extracted textile fiber for each species will be characterized for its fiber property and processability. The deployment of fiber processing technology will benefit the communities by involving them in the most | Publication: Two (2) technical articles on the fiber quality of locally planted Bamboo species in Abra and Pangasinan;Patent: Two (2) PAs (Utility model/Industrial design for fabric rendered using the bamboo blended and natural textile fiber blended yarns)Product: At least 10kgs of bamboo fibers for each identified three (3) local Bamboo species in Abra and Pangasinan;200kgs bamboo blended yarns;Two (2) prototype of fabrics developed;People: Ten (10) people trained on bamboo textile fiber extraction and natural fiber treatment;Place: Two (2) Memorandum of Agreement forged with local organizations in Abra and Pangasinan;Policy:One (1) policy recommendation on the sustainability of bamboo raw materials for textile utilization   | DOST-Philippines Textile Research Institute (DOST-PTRI)              | 1. Farmers/farming communities 2. Craft makers3. Handloom weaving communities   | 01-Oct-22 | 31-Mar-25 | ONGOING                          | 16,859,968         | 2,403,570.00     |

| 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, 2024 | Total Project Cost | 2024 PCAARRD GIA |
|---------------|---|---|--|---|--|---|-----------|-----------|---------------------------------|--------------------|------------------|
|               | Comparative testing and piloting of Superior Yemane, Bagras, and Manglum clones for Improved Wood Production in Regions 10, 11, and 13  | Rapid, inclusive and sustained economic growth                            | The project will serve as an initial stage for the tree improvement program for ITPs in Mindanao, targeting Yemane, Bagras and Manglum by conducting pilot testing of clones propagated from superior mother trees using performance evaluation in terms of growth, survival rate and tree adaptability to different environmental conditions.&nbsp;   | Publication: 1 article on rejuvenation protocol; 1 article on field performance of clones; 3 brochures on macroclimate protocol propagation; and 1 brochure for each species;Patent:Utility model on the improved planting materials of 3 ITP species;Product: 64 mother trees selected; 3 ramed gardens established (1 per species); 3 Rejuvenation trials established until 2nd generation (1 per species); 18 hectares field trials established; and 3-4 demonstration farms established;People: 5 students mentored; 5 students mentored; and 5 students mentored;PlacePartnership: - 3 MOAs forged with people's organizations engaged in ITP tree growing;Policy: 1 policy brief on propagation and plantation establishments of mangrelina, bagras and manglumSocial Impacts: Improved knowledge on the mass production of superior planting materials of manglum, gmelina and bagras in the region; and increased interest among tree farmers and wood industries for using manglum, gmelina and bagras as alternative tree species for wood/lumber productionEconomic Impacts: Increased income for farmers from seedling production; and increased timber yield and income from manglum, bagras and manglum plantations | University of Southeastern Philippines (UseP), Central Mindanao University (CMU), Aguan del Sur State College of Agriculture and Technology (ASSCAT) | DENR/NGP participants, farmer tree growers, forest nursery operators, ITP industries, students, researchers and academe   | 01-Nov-24 | 31-Oct-27 | ONGOING                         | 18,834,308         | 7,795,560.24     |
|               | Conservation and Management of Mt. Arayat Protected Landscape (MAPL) through Enhanced Community Participation   | Rapid, inclusive and sustained economic growth                            | This project is a solicited proposal from PSAU under PCAARRD's Biodiversity Skamp-T program.&nbsp;It will specifically address the conservation and management of biodiversity resources in MAPL through ecotourism.&nbsp;   | Publication: 2 publicationsA Patent: Copyrighted EC Materials and Training GuideProduct: DevelopedA, ecotourismA, for Mt. Arayat Protected LandscapePeople: 4 Trainings on Wildlife Literacy and Tour GuidePlace: Eight barangays and two municipalitiesA, partnership developedPolicy: 1 Policy Recommendation in Ecotourism   | Pampanga State Agricultural University (PSAU)  | Locals of the communities surrounding Mt. Arayat.   | 01-Jan-23 | 30-Jun-25 | ONGOING                         | 4996 231.60        | 2,064,834.20     |
|               | Conservation and Management of Mt. Arayat Protected Landscape (MAPL) through Enhanced Community Participation (Phase 2)   | Rapid, inclusive and sustained economic growth                            | The project aims to improve the conservation and management of Mt. Arayat by identifying key species for protection, monitoring biodiversity, assessing the value of these species, assessing the sustainability of the conservation tourism activities, and strengthening local community involvement.  | Publication: 1 Patent: 10Product: 16; 27People: 31; 32; 33Place: 44Policy: 48   | Pampanga State Agricultural University (PSAU)  | Local communities surrounding MAPL<br>• Academe institutions within 10km radius of the MAPL   | 01-Dec-24 | 30-Nov-26 | ONGOING                         | 5,000,000          | 2,688,732.00     |
|               | Development and optimization of micropropagation protocol for selected bamboo species (Old Title: Optimization of micropropagation protocol of genetically-verified superior bamboo species)          | Integrity of the environment and climate change adaptation and mitigation | Bamboos are essential non-lumber forest species in the world because of their adaptability, quick physical growth and development that result to renewable materials for construction and furniture products. Growing bamboo has high economic potential. Promoting bamboos into a variety of items from toothpicks, chopsticks, barbecue sticks, to basketware and furniture provides benefit from the bamboo culms, making business available and profitable for communities and village-level entrepreneurs. The government aims to develop bamboo plantations nationwide through the leadership of the Philippine Bamboo Industry Council (PBIC), in order to create sustainable sources of livelihood for Filipinos especially in the provinces (DIT, 2020). Government organizations such as the Department of Science and Technology (DOST), (2020) Partnership with the Philippine Army, launched the Bamboo Plantation Development Project that aims to rehabilitate denuded areas in the military reservation and combat the effects of climate change (Gillaso and Jimenez, 2020). Bamboos are among the fastest biomass producers that are used as alternative to wood. Thus, an increase in their consumption subsequently exerts pressure on the genetic resource. The number of species, geographic range of distribution, species and ecosystem diversity are important to determine in situ conservation programme and selection of appropriate species from good populations for ex situ conservation. 2 International funding has been focused on a relatively small set of commercially important and widely distributed priority bamboo species (Williams and Rao, 1994; Rao et al., 1998) reviewed in Thakur 2016), paving the way for genetic improvement to increase productivity. This can be achieved by comprehensive intra-specific studies on bamboo such as flowering and breeding behavior, hybridization, cytoplasmic selection, selection of desirable populations and individuals, and many more, and their application to increase productivity (Williams, 1998). Recently, trait-specific molecular and genetic information are also being used for genetic improvement. The main aim of tissue culture is to obtain true-to-type plants to maintain the germplasm, but during tissue culture, there is a chance of genetic alteration, which is commonly known as somaclonal variation due to stress imposed on the plant under in vitro conditions (Goyal et al., 2015). Due to this nature, screening for genetic fidelity of the tissue-cultured bamboo explants must be done to maintain the advantages of desired elite genotypes of the species (Mohammadi et al., 2016). Micropropagation using satellite buds has been reported to be one of the best available methods for rapidly increasing elite genotypes of bamboo because the regenerated plants are all genetically uniform. An extensive review by Mulu et al. (2013) reported that wide ranges of bamboo species are amenable to micropropagation. The technique could ensure a steady supply of planting materials in a short time and help in the   | Publications<br>Manuscripts on bamboo peer-reviewed journal<br>1. Protocol development for tissue culture for mass production 2. Genetic profiles of selected bamboo species<br>3. Microbial endophytes elimination for tissue culture of bamboo<br>Patent<br>One intellectual property rights (IPR) application for technologies/products developed from tissue culture<br>Products<br>Minimum of 100 Plantlets from tissue culture of each bamboo species<br>Protocols for tissue culture of 3 bamboo species<br>People Services<br>Three (3) staff trained on tissue culture<br>Places and Partnership<br>Partnership between the College of Forestry and Natural Resources and College of Agriculture and Food Science * UPLB in the implementation of the project established<br>Places and Partnership<br>Draft policy recommendation on bamboo species for selection, utilization for mass propagation by tissue culture, and commercialization of tissue culture plantlets, highlighting the appropriate evaluation of materials prior to production and commercialization of tissue cultured bamboo plantlets  | University of the Philippines Los Baños (UPLB)   | The results of the study will benefit various stakeholders including the forestry sector, and the DENR, in designing and implementing conservation and sustainable management of bamboos in the country. The government's National Greening Program (NGP) and other forest rehabilitation program will also benefit through the availability of increased number of bamboo planting materials through tissue culture. | 16-Aug-22 | 15-Aug-24 | COMPLETED                       | 3,497,070          | 648,849.02       |
|               | Development and Standardization of Four-Sided Bamboo Slat Planning Machine for Small-Scale Enterprise Production of Engineered Bamboo   | Rapid, inclusive and sustained economic growth                            | One of the Philippine bamboo industry development roadmap goals is self-sufficiency of raw materials and cost-effective technologies and production processes. As the economic viability of bamboo continues to rise, it is replicated that the development of the engineering products of bamboo will achieve high productivity and productivity, utilizing the growth of more processing industries. Efficient and effective machines for the processing of the materials appropriate to the technology necessary in order to achieve the long-term goal. Virtuoso (2009) classified bamboo industries according to assets and includes: backyard, small-scale, medium scale and large scale. Backyard and small-scale enterprises that dominates among the categories have annual revenues not exceeding P10 000,000 and 1,000,000,000 respectively. Aside from the government's significant investments on the research of bamboo, still maximum efficiency in processing bamboo products was not attained because backyard and small-scale enterprises are attributable low-capital and are incapable of affording and operating advanced technologies (Ramirez, 1999). The gap on research endeavors of improving the production and processing of engineered bamboo should be addressed by assessing and evaluating the performance of existing machineries and develop locally manufacturable and scale-appropriate machineries with competitive capability and output through value engineering. Especially, value engineering is carried out in one of two ways: (1) improve the functionality or increase the value of a product at similar cost of production; or (2) explore alternative ways to accomplish the same function at lower product cost (Mahajan et al., 2019). This research, therefore, aims to identify alternative materials and/or fabrication technologies that may result to the same design and accomplish the same functionality but at a lower production cost for the development of a more industry-appropriate and economically adaptable machineries.   | Publication: Results of the research will be submitted for publication in peer-reviewed or indexed journals;Patent: The developed machine will be applied for a patent or as utility model A, Product: The developed machine will serve as a tangible product or prototype that can be replicated or mass produced for use by small-scale enterprises for their bamboo processing;People: The development of the proposed machine can help improve the lives of small scale bamboo entrepreneurs. Opportunities for training in the operation and maintenance of the machine can also be provided to operators;Place: The development of the planting machine will establish the beginning of partnership between Central Mindanao University and small-scale bamboo entrepreneurs in the region in terms of appropriately mechanizing the bamboo processing;Policy: This endeavor can result to possible policy and/or program by the government to address the specific needs of small-scale bamboo entrepreneurs.  | Central Mindanao University (CMU)  | 1.&nbsp;Small and Medium Scale Bamboo Enterprises;&nbsp;2.&nbsp;Local fabricators and machine operators;&nbsp;3.&nbsp;Artisans, Craftsmen and women in the bamboo processing industry;&nbsp;  | 01-Mar-23 | 28-Feb-25 | ONGOING                         | 4,999,880          | 961,000.00       |
|               | Development of Plant Extract-based Wood Protection Treatment For and From Selected Plantation Species   | Rapid, inclusive and sustained economic growth                            | Wood is an important forest resource which has been used for various increasing applications, i.e. no longer limited to construction, furniture, handicrafts, toys and musical instruments. Unfortunately, wood being an organic material is naturally susceptible to decay and this condition is further aggravated when it is used in unfavorable service environment like in humid or wet conditions. All wood species can deteriorate if exposed to conditions that support the growth and infestation of different wood degrading and destroying organisms. However, some species like the Philippine Mahogany Group are naturally more resistant to degradation compared to fast growing species like gmelina, falcatia and manglum. Application of wood preservatives will significantly increase the life span of these species, thus reducing costs of replacement that also allows for more efficient use of forest resources (FTA 2003). With the depleting supply of local wood due to deforestation and implementation of EO 23, local channels our reliance of wood source to plantation species, proper utilization and protection are, therefore, more than ever crucial to maximize the benefits we derived from tree plantations.<br><br>Recognizing the need for more durable wood, some preventive and control measures using chemicals have been developed and used. Integrating wood with toxic chemicals or biocides is the customary way of prolonging the service life of wood. Some of the usual ones that are used in the Philippines are crossite, chromated copper arsenate (CCA) and pentachlorophenol. However, these traditional wood preservatives can also adversely affect human health and the environment. This led to the regulated use of these preservatives. Fortunately, serious efforts are now being made globally to develop alternative wood protection methods based on natural products with little or no toxicity effect to humans and the environment.<br><br>In the Philippines, with the implementation of EO 23, there is a moratorium on the cutting and harvesting of timber in the natural and residual forests, that lead wood utilization options to plantation species like falcatia (Parinariites falcataria), gmelina (Gmelina arborea) and manglum (Acacia mangium Willd.). These species were reported to have good physical and mechanical properties (Alipon and Bondad 2008) and are abundantly planted in CARAGA. However, these species if improperly stored after harvesting are more prone to attack of wood destroying organisms like termites and fungi compared to non-fast growing hardwood species. Further, fast-growing species have high proportion of juvenile wood, low density, low strength, low durability, and low mechanical properties. The wood of these species are not suitable for structural timber (Hidayat et al., 2018). In fact, tree farmers and sawmill operators in CARAGA expressed their need for immediate and practical but low-cost on-site wood protection treatment system to immediately inhibit the attack of these wood destroying organisms prior to processing. This project aims to address this expressed need as the proponents recognize this as the first important step towards maximizing the benefits from these plantation resources in view of the fact that | 6 P&P Publications YEAR 1<br>One (1) IEC material about extraction and formulation of potential plant-based preservatives YEAR 2 One (1) manuscript for publication in peer reviewed journal &nbsp;Patents YEAR 2<br>One (1) invention disclosure application for the developed product/formulation &nbsp;Place-Products<br>YEAR 1<br>One (1) wood preservative formulation from plant-based extracts YEAR 2<br>One (1) wood product formulation and plan of application &nbsp;Place:People Service YEAR 1<br>One (1) graduate student One (1) URA 1 trained YEAR 2<br>One (1) graduate One (1) URA 1 trained 20 stakeholders trained about the developed wood protection system &nbsp;Place<br>and Partnership YEAR 1<br>One (1) partnership with industrial tree plantation owners/farmers/Peas in the form of MOU or MOA YEAR 2<br>One (1) partnership with sawmill/venery/wood/wood processing plant in the form of MOU or MOA &nbsp;   | University of the Philippines Los Baños (UPLB)   | The target beneficiaries of this project are the plantation developers and farmers, wood processing plants, wood preservation industry, downstream industries and wood users.   | 01-Apr-23 | 31-Mar-25 | ONGOING                         | 2,633,484          | 2,313,920.76     |
|               | Development of technology and innovation model farm to indigenous and economically valuable species to support traditional industries for forest restoration and biodiversity conservation in Benguet | Rapid, inclusive and sustained economic growth                            | The goal of the project is to develop a technology innovation farm and pilot test economically viable production technologies of raw materials for desired products (Kabayang and local beverages), and scale-up these technologies as sustainable forest restoration technologies consistent with the biodiversity objectives of the forest landscape in Benguet. For the Phase 1 of the project, it will Develop the technical and socio-cultural protocols that cover the establishment and management of model farm to provide a viable supply of raw materials for the production of desired products, while the Phase 2 is envisioned to pursue innovative forest restoration strategies that achieve ecological, economic, and biodiversity objectives of the project.  | Publication: 2 Publishable articles submitted 1 Manual on GIS mapping 1 Tech-guide for growing species of interest in local dipterocarpaceae 2 Suitability maps 1 AP on harvesting & manufacturing of Kabayang/local beverage People Services: Trainings for 2 LGU, NGA and others, for 30 professionals (2 GIS mapping events) Training on clonal & nursery management practice, for 20 participants Training on field crop management for local partners for 20 participants Places and Partnership: Partnership MOU with at least LGU and/or SUC 1 Partnership agreement w/ local cooperator for the model farm Policy 1 Policy brief on conservation of native plants raw materials for Kabayang/local beverages  | Benguet State University (BSU)   | Local government units of Atok and La Trinidad Benguet Farmers and local communities of Atok, and La Trinidad, Benguet Local industry workers cooperatives for bamboo crafts and local beverages PENRO-DENR, MENRO, La Trinidad and Atok, and PENRO (PLGU)  | 01-Mar-23 | 28-Feb-26 | ONGOING                         | 4,999,898          | 1,813,862.00     |

| 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, 2024 | Total Project Cost | 2024 PCAARRD GIA |
|---|---|---|--|--|--|---------------|-----------|---------|---------------------------------|--------------------|------------------|
| Diversity, distribution and conservation status of Anuran species in Mananga and Kokot Watersheds, Cebu, Philippines                                  | Rapid, inclusive and sustained economic growth                            | Cebu Island is in Central Visayas, Philippines, is the most degraded place in the country's central region (Collar et al., 1999). Records show that Cebu Island's forest cover is less than one percent of its total land area (Mallari et al., 2001). The region's high rate of deforestation has seemingly led to the local extinction of wildlife and many birds (Brooks et al., 1995; Rover, 1999; Magatay et al., 1995; Brooks et al., 1995; Collar et al., 1999). Moreover, deforestation has severely disturbed important ecosystems on the island including watershed forests and river watershed reserves that support the growth of both aquatic and terrestrial species. In Cebu, two critical watersheds namely Mananga Watershed Forest Reserve and Kokot River Watershed Forest that supply water to the metropolis of Cebu City have been reported to be in bad shape due to the fast-growing number of people living within its basins accompanied by the destructive anthropogenic activities (Quinio, 2006; DENR, 2008). Amphibians, such as anurans, are dependent on terrestrial and aquatic environments, making them good biological indicators of environmental health (White, 1999). However, the local population of anuran species in degraded ecosystem is greatly decreased with the increased habitat destruction and loss (Paris, 2004) as landscape changes can be limiting for anuran survival and reproduction (Frank et al., 2013). Yet, in some instances, anuran species that have high fecundity (Williams & Hero, 1998) seem to survive in disturbed ecosystems (Gibbs, 1996) though it is not guaranteed that they will continue to thrive in such situations in the long-run. If such situation persists, the decline of the anuran population may still lead to extinction (Jose, 2012), significantly impacting environmental processes and ecological functions. Anurans are not only important in the balance of the watershed ecosystem. They also have economic value within the ecosystem. Particularly, anurans have been significant predators of insect pests that either destroy crops or transmit diseases. They are also served as food delicacies in some parts of the country either for local consumption or for commercial export. Though wild species are not edible but rather poisonous. Moreover, the secretions of anurans are important in the production of anesthetics, pesticides as well as antibiotics (insect reference). Further research on the use of these anurans may unfold more economic potential in them.   | Publications<br>Year 1IEC materials (brochures) on the diversity of anurans associated flora and fauna in Mananga and Kokot Watersheds; at least 1 paper presented in a scientific conference; Photo and video documentation of Anuran and life forms in the two watersheds<br>Year 21 Monograph of Species of Anurans in the two watersheds; Paper for Publication on the impacts of watershed alteration on Anuran population; Scientific paper submitted for publication; Patents/Year 2Copyrights of Guidebook Products/Year 1Information on taxonomy, diversity, and ecology of Anurans and associated flora and fauna, GIS maps of the Anuran collection sites; GIS maps (Resource / Location Map) of watersheds; Database (content build-up/Year 2Species listing of Associated flora and fauna associated with watershed; Zoning plan of watersheds reflective of research, planning, reserve and tourism areas/Annexes/Alternative Land-Use Plan/Database (content build-up) People and Services/Year 1 and 2 Personnel trained in collection of Anuran specimens and laboratory works/ undergraduate students mentored Places and Partnership/Year 12 project sites/ Collaboration with DENR, DA and LGUs of Talasa City and Misamis/Year 22 project sites/ Collaboration with DENR, DA and LGUs of Liloan and Compostela Palices Year 2Policy recommendation on watershed and anuran conservation/Policy recommendation on the control of extraction of some valuable species in the watersheds for sustainability  | Cebu Technological University (CTU)            | 1. Municipal Local Government Units and Barangay Local Government Units/2. Policymakers/3. Academics, researchers, and environmentalists/4. People/5. The Organization and Local Communities; Women and Men and Youth Groups   | 01-Apr-23     | 31-Mar-25 | ONGOING | 5,000,000                       | 1,270,018.20       |                  |
| Enhancing the conservation and breeding program of the Philippine spotted deer, Rusa alfredus using molecular-based approaches for natural resiliency | Integrity of the environment and climate change adaptation and mitigation | The Philippines is a megadiverse country with high rates of endemism. One of the top biodiversity conservation priority areas in the Philippines is the Negros-Panay region as it is a home to many threatened endemic species. However, due to the country's rapid population growth, threats such as habitat destruction, overexploitation, climate change, and disease-causing pathogens. Because of this, there is an urgent need of action backed by basic research to protect and nurture the existing terrestrial biodiversity of our country, especially in the Negros-Panay region. The Philippine spotted deer, Rusa alfredus, is one of the five key species of the Negros-Panay region. This deer species is only found in the Philippines and is deemed to be the rarest, least distributed, and most narrowly distributed species in the world (Key, 2003). Captive-breeding program initiatives are currently being conducted by the Talara Foundation and the Silliman University Center for Tropical Conservation Studies (CENTROP) to protect this species. However, data to enhance the program is scarce. Currently, there is a need to understand the genetic diversity, inbreeding levels, and the health baseline of its deer species (Roca-Margalea et al., 2021). This project aims to enhance the program by improving the genetic stock of the captive individuals and prepare them for reintroduction to the wild. Therefore, this study would like to address those gaps by understanding the genetic diversity and screening the vulnerability of the captive stock of the Philippine spotted deer in the Negros-Panay region. The project aims to understand the phylogenetic relationship, inbreeding frequency, and the natural selection mechanism of their immune genes against extracellular pathogens.   | Publication<br>brochure about the Philippine spotted deer generate at least two (2) scientific article drafts for possible publications<br>Products<br>protocols for DNA barcoding of the Philippine spotted deer produce DNA barcodes, mitochondrial markers, protocols for identifying and analyzing the mitochondrial markers of the Philippine spotted deer produce MCH profiles for target species, protocols for identifying and analyzing the MHC genes of the Philippine spotted deer Ancestral breeding protocol and conservation program of the Philippine spotted deer at CENTROP.<br>People/Services<br>Build capacity of at least 3 faculty/staff; staff in molecular biology and bioinformatics possible mentorship of DOST - GREAT scholars on molecular biology and bioinformatics<br>Build capacity of at least 10 faculty/staff; staff, undergraduate and graduate student in molecular biology and bioinformatics possible mentorship of DOST - GREAT scholars on molecular biology and bioinformatics<br>Build capacity of at least 10 faculty/staff; staff, undergraduate and graduate student in molecular biology and bioinformatics possible mentorship of DOST - GREAT scholars on molecular biology and bioinformatics<br>Places and Partnership<br>Strengthen partnership with Department of Environment and Natural Resources (DENR), academic institutions, NGOs and captive breeding facilities within Panay and Negros islands focused on the conservation and protection of endemic fauna. Enhancement of the staff and molecular laboratory of Silliman University. Information sharing with the different stakeholders (launching event)<br>Strengthen partnership with Department of Environment and Natural Resources (DENR), academic institutions, NGOs and captive breeding facilities within Panay and Negros islands focused on the conservation and protection of endemic fauna. | Silliman University (SU)                       | Filipinos by preserving a Philippine natural heritage for present and future generations DENR by supporting their mandate of conserving mangrove, protecting wildlife for ecosystem integrity, Local academic institutions by building the capacity of faculty & students to apply molecular-based approaches for conservation Specific list of stakeholders and their roles a DENR, PENRO, PENRO, Regional Executive Director (RED), Facilitation of necessary permits; policy development & implementation specific to PSD conservation program, development of plans for habitat suitability assessments, deer reintroduction, deer translocation, etc b Silliman University, Biology Department- implementing body Building the capacity of faculty and students to apply molecular-based approaches or conservation, c Silliman University Center for Tropical Conservation Studies (CENTROP)- Conservation program amendment; provide deer samples d Mar-II Eco Park (West Visayas State University)- Conservation program amendment; provide deer samples e Talara Foundation- Conservation program amendment; provide deer samples.                    | 01-Oct-23     | 31-Jul-26 | ONGOING | 9,218,276                       | 1,975,946.00       |                  |
| Ecology, Detection and Management Strategies against Pestalotiopsis Disease of Rubber   | Integrity of the environment and climate change adaptation and mitigation | This project deals with the emerging Pestalotiopsis causing leaf fall disease of rubber by conducting preliminary studies on the epidemiology by determining the host range, pathogenicity, and the occurrence of disease complex involving major rubber leaf diseases and the Pestalotiopsis. This aimed to provide intervention through the development of DNA-based detectors and integrative management strategies to circumvent the possible outbreak of the disease in the country towards increased rubber quality and production. The cross-infection potential of the emerging Pestalotiopsis pathogen of rubber to different plant species is important to determine to identify plant species as possible interspecific and this will add to the existing knowledge on the epidemiology of the disease. The knowledge on the co-infection scenario of Pestalotiopsis with other leaf pathogens of rubber is also important for the development of effective control measures. The development of easy-to-perform molecular platforms for diagnosing pathogens is necessary for early detection and implementation of prompt mitigation measures to prevent the spread and outbreak of the disease. Also, the development of integrative management strategies against Pestalotiopsis like screening for resistance of existing clones, and evaluation of biological and chemical-based treatments should be done to optimize effective management strategies against the emerging disease. The above concerns should be addressed through various D programs of rubber agencies particularly the PRRI as an output of several meetings, consultations, and discussions made with TWG for Pestalotiopsis. This could have a great impact on small to large-scale rubber stakeholders. After the project's completion, the preliminary information on the biology and epidemiology of Pestalotiopsis will be determined and rapid and accurate molecular platform for the disease will be developed and cost-effective management strategies to circumvent the spread and outbreak of the disease in the country.  | Publications<br>At least 2 scientific papers<br>At least 1 paper presentation in a conference<br>Patent: Patent for the DNA-based diagnostic method<br>Patent for the integrative management strategy<br>Product:<br>DNA-based diagnostic for Pestalotiopsis<br>Effective and integrative management strategy for Pestalotiopsis<br>People:<br>1 MS graduate student<br>Awareness campaign to 100 rubber farmers in Regions 9 and 12/Place: Partnership with rubber farmer, c.a associates, SUC, DA-PRRI and other government agencies<br>Policy: Plant health certification of Pestalotiopsis free rubber planting material and plantation<br>Policy brief for the status and management strategies for rubber plantations leaf fall disease  | Philippine Rubber Research Institute (DA-PRRI) | Local farmers/plantation owners<br>Rubber cooperatives and association<br>Local Government Units<br>Researchers<br>SUC   | 01-May-23     | 30-Apr-25 | ONGOING | 5,000,000                       | 1,125,154.00       |                  |
| Evaluation of Promising Rubber Clones as Clonal Rootstocks  | Integrity of the environment and climate change adaptation and mitigation | In line to the rubber industry problem related to the low productivity of the crop, selection of the seeds or rootstock is one of the factors contributing to the growth development that partly governs the yield of rubber tree. One major concern is the limited information on rootstocks that is suitable for propagation. Commonly, small-holder farmers were originally established with rootstocks from unselected sources of seeds. The use of varying unselected seeds will lead to considerable heterogeneity resulting to lower yield (Somanayake et al., 1988 as cited by Wileto, 2015). The performance of the parent tree as the source of seeds is one thing to consider. Stock seedlings from clones with good performance producing vigorous roots is a good choice as it significantly improved the yield of the crop (Smith et al., 2008). Various promising rubber clones are newly introduced in the country and these could be potential use as seedling stock. This study will evaluate the seedlings of these clones under nursery and field trial. Clonal rootstocks that possess commendable growth development will be recommended.   | Publications: Flyers, leaflets, terminal reports, posters, journal/Patent: Non-product:<br>None/People: Rubber farmers, nursery operators, rubber stakeholders/Place: Nursery/Policy: Use of recommended clones as clonal rootstocks   | DA Region 9                                    | Rubber farmers<br>Nursery operators<br>Rubber stakeholders   | 01-Jul-22     | 31-Dec-24 | ONGOING | 4,447,660                       | 468,644.52         |                  |
| Field trial plantation of indigenous tree species for the wood-based industry in Laguna and Quezon  | Rapid, inclusive and sustained economic growth                            | Wood supply and demand study on Region 4-A by Vilanova et al., 2010 reported that the region's wood supply has been declining over the years. To satisfy the demand for wood, Region 4-A cuts down the trees and uses wood from other regions and abroad. Based on the study, the gap between the wood demand and supply may narrow down if the industry finds an alternative material to wood; the existing forest degradation is stopped; and more commercial plantations will be developed to meet local demand for timber. Highlighting the need to develop commercial or industrial tree plantations, the program in the Philippines has a lot of potential (Paler, Shinohara, del Castillo, & Nomura, 1998) in aiding the future of the wood-based industry. The DENR's Forest Management Bureau (FMB) estimated that the country requires 6 million cubic meters of wood-based on the average consumption from 2006 to 2014 (2010 Wood Summit, https://forest.denn.gov.ph). The FMB reported that wood industries are still importing around 4 million cubic meters of round wood equivalent, as our local production only provides less than 1 million cubic meters (https://businessmonitor.com/2020/02/02/wood-supply-in-the-forest). Hence, there is a need for around 42,000 hectares of mature plantation annually in order for us to be self-sufficient in meeting the wood requirements in the country. There is a need to promote indigenous tree species for plantation development as well as develop a science-based selection protocol for superior trees, as the future sustainability of the wood-based industry rests largely in developing ITPs with high-quality seedlings. The provinces of Laguna and Quezon are known for their wood and wood-based industry. Paete has a great reputation for handcrafted wooden products, being named the Eco-Caring Capital of the Philippines. Other wood-based industries in the province are the following: LOPA Enterprises. Other wood-based industries in the province are the following: LOPA Enterprises, Lathipops and Pagsipala sticks from Masagapaya in Alifan, Paete maker and producer in Alifan, Quezon, New Gumaca Woodcraft Multi-Purpose Cooperative in Gumaca, Quezon; furniture maker and designer of Canes Furniture in San Pablo City, Laguna; handcraft maker in Mutanyan, Quezon; and RI Ordonez wood trading and woodcrafts in Calico, Sta. Cruz, Laguna; and JMD Trading Sash Factory Furniture and Design in Candelaria, Quezon. However, the continuing deforestation of the remaining forests in demand of the industry. For this project, the identified species to be studied | 6Ps Publication Year 1 1 0 news and feature article of ITS for the wood-based industry/2 2 1 training modules on seeds and fruits collection, and seedling production of ITS/Year 2 2 0 news (1) IEC material in the form of a promotional pamphlet on ITS for the wood-based industry in Laguna and Quezon/Year 3 2 Draft one (1) scientific article submitted for publication in peer-reviewed journal/Year 4 0 news article on field trial establishment, layout and management/Year 5 0 news (1) news feature article on develop 6 ha seedling seed orchards (SSO) from the established field trial plantation for the 3 species/Year 2 Application for copyright of the training modules Products Year 1 1 Spatial distribution maps of mother trees per species, with their phenology (fruiting and collection period) scheduled documented for the identified ITS for thousand (4000) quality seedlings of P. nodosa, M. azedarach and L. cordata for field trial arrosue/Year 2 2 Six (6) hectare field trial plantation of ITS Four thousand (4000) quality seedlings of P. nodosa, M. azedarach and L. cordata for field trial products/GIS map of geotagged plantaid seedlings for the field trial plantation/Complan conservation and nursery propagation protocol adopted/modified/developed Year 3 3 Checklist of selected ITP and associated plants/Grow performance and microclimate measurements of the established field trial Year 4 Develop 6 ha seedling seed orchards (SSO) from the field trial plantation established for the 3 species GIS map for SSO location/Year 5  | University of the Philippines Los Baños (UPLB) | The target industries to be catered and possible adopters of the project are the following: Wood carvers of Paete, manufacturers of chopsticks, toothpicks, ice cream spoon, and popsicle sticks from Masagapaya in Alifan Enterprise Pagsarjan, Laguna. Palet maker and producer in Alifan for Laguna Southwood Products Inc (LSPI) in Laguna, New Gumaca Woodcraft Multi-Purpose Cooperative in Gumaca, Quezon, lumber, sash factories, and furniture maker and designer of Canes Furniture in San Pablo City, Laguna, Laguna handcraft maker in Mutanyan, Quezon, R I Ordonez wood trading and woodcrafts in Calico, Sta. Cruz, Laguna and JMD Trading Sash Factory Furniture and Design in Candelaria, Quezon. Other beneficiaries will include upland farmers, wood-based industries, Provincial and concerned municipal LGUs, business partners, DENR Regional and Provincial Offices, Research Institutions, community residents in the project sites, and other interested groups who will be provided with better income opportunities through the establishment of field trial site for plantation development, increased supplies of raw materials, | 01-Feb-23     | 31-Jan-28 | ONGOING | 8,248,000                       | 1,521,000.79       |                  |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---------------|--|---|--|--|--|---|-----------|-----------|----------------------------------|--------------------|------------------|
|               | Field verification of bamboo textile fiber technology using Giant bamboo ( <i>Dendrocalamus asper</i> ) in Northern Mindanao | Rapid, inclusive and sustained economic growth                            | In support of the CMU-Bamboo NIGER R&D Center in Bukidnon, this project shall innovate in the utilization of giant bamboo ( <i>Dendrocalamus asper</i> ), endemic in Northern Mindanao, for natural textile fiber processing, upskill Higher Education Institute (HEI) personnel, students, laborers, and farmers, and establish a local Bamboo Textile Fiber Innovation Hub (BTFH) in the region. The BTFH shall provide cost-effective alternatives for textile processing out of giant bamboo in Northern Mindanao, as well as address the usage of underutilized sections of giant bamboo in manufacturing engineered bamboo. This project will verify the fiber processing and extraction of giant bamboo at the community level and process them into yarns. The same procedure will be conducted such as mechanical extraction, alkali treatment, yarn processing, and weaving of prototype fabrics. This project will also explore textile machinery innovation approaches related to bamboo textile fiber manufacturing in order to further improve its function, reduce production costs, and ensure ergonomic production and proper operation procedures. The initiative of this endeavor aligns with the goal of the CMU-Bamboo R&D Center to achieve sustainable management and utilization of bamboo resources, as well as in promoting industrial competitiveness and regional development of the region's bamboo industry.   | Publication:<br>One (1) publication on field verification of textile processing application using Giant bamboo ( <i>Dendrocalamus asper</i> )<br>One (1) publication on bamboo-related textile machinery fabrication and performance evaluation<br>Patent: Two (2) utility models on Bamboo Slating Machine and A, Bamboo Textile Fiber Extraction Machine/Product<br>60kgs 75/25 Polyester/Bamboo and 60kgs 75/25 Cotton/Bamboo (Y1)<br>200 meters fabric made from 75/25 Polyester/Bamboo<br>200 meters fabric made from 75/25 Cotton/Bamboo<br>Two (2) appare (lops) for each fabric produced from giant bamboo<br>60kgs yarns made from 75/25 Polyester/Bamboo and 75/25 Cotton/Bamboo (Y2)<br>One (1) fabricated Bamboo Slating Machine<br>One (1) fabricated Bamboo Textile Fiber Extraction Machine<br>People:<br>At least ten (10) HEI personnel and students in CMU trained in material preparation, equipment operation and maintenance, fiber extraction, and treatment. (Y1)<br>At least ten (10) farmers/laborers/technicians trained in material preparation, equipment operation and maintenance, fiber extraction, and treatment. (Y2)<br>At least ten (10) HEI personnel and students in CMU trained yarn production. (Y2)<br>At least six (6) personnel and students of CMU or members of the community trained in handloom weaving. (Y2)<br>Place:<br>One (1) linkage established in Central Mindanao University (CMU)<br>One (1) established Bamboo Textile Fiber Innovation Hub (BTFH) in Northern Mindanao<br>Policy: N/A  | DOST-Philippine Textile Research Institute (DOST-PTRI)               | The target beneficiary of this project is mainly the Central Mindanao University (CMU) which is in line with the initiative of CMU-Bamboo R&D Center in Bukidnon. Regardless, farmers/cooperatives may still benefit with this project in securing a steady supply of giant bamboo poles. This project will also benefit the local handloom weaving community in Northern Mindanao and its craft makers. A, A.  | 01-Jan-23 | 31-Dec-24 | ONGOING                          | 18,927,898         | 5,294,298.88     |
|               | Field Verification of Innovative Technologies on Rubber Farming System   | Rapid, inclusive and sustained economic growth                            | The establishment of rubber farm by testing the effectivity of innovative approach on rubber farming system that aims to produce a sustainable higher production of rubber cuplumps.<br>This project generally achieve the following:<br>Shorter maturity period starting at 3.5 years<br>High percentage of productive trees up to 100% by year 5<br>Uniformity of stands<br>Shorter trees that mitigate the impacts of strong winds.<br>Contribute to the poverty alleviation of the farmers.  | Publication: Production of IEC Materials (this will be undertaken during the year 3 of the project)<br>Establishment of Rubber Model Farm using advanced rubber farming technology, Public-Private Partnership (PPP) approach, and Rubber Training Manual/Product: Rubber Production Training Manual/Product: Rubber Training Materials, People: Training on the new technology in rubber production will be conducted Place:<br><br>Memorandum of Agreement/Understanding between 3 collaborating agencies for this project<br>ASSCIAT, San Teodoro, Bunawan, Agusan del Sur<br>AMARBEMCO Prosperidad, Agusan del Sur<br>PWRI- Malibak, North Cotabato<br>PQAS-Provincial Government of Agusan del Sur  | Agusan del Sur State College of Agriculture and Technology (ASSCIAT) | AMARBEMCO ARUPA Rubber farmers of Trento, Agusan del Sur Rubber farmers of Butuan City, Agusan del Norte  | 01-Jan-23 | 31-Dec-25 | ONGOING                          | 4,957,522          | 1,423,673.96     |
|               | From Waste to Wealth: Production of Nanosilica from Bamboo Harvesting and Processing Wastes (W2W-Bamboo)                     | Rapid, inclusive and sustained economic growth                            | The project will document and characterize the different forms of bamboo wastes generated during the harvesting and processing of bamboo and explore the generation of value-added products from these wastes. The objective of the project is within the scope of the research priorities under the Harmonized National R&D Agenda in Agriculture, Aquatic, and Natural Resources, cutting across innovative product development and value addition agenda specifically for bamboo, which is considered a priority commodity in the course of processing bamboo, different forms of wastes are generated. Tops, branches, and leaves are left behind during harvesting, while trimmings, shavings, and saw dusts are generated during processing. More wastes are expected to be generated from the industry with the promotion of more investments in the local bamboo sector as the Philippines is being justified to become a key player in the global bamboo industry. However, limited information is available about these wastes, especially those generated by our local bamboo processing industry. Hence, the documentation and characterization of these wastes or by-products specific to the local settings will provide valuable information. The prospects to be explored include the synthesis of nanosilica particles and the application of these nanomaterials to wood and bamboo modification for enhanced properties. The transformation of the bamboo harvesting and processing wastes into these products will contribute to the optimal utilization of the resource. Feasibility studies form another important component of the project to examine the viability of producing nanosilica from the wastes and its application to wood and bamboo modification, and determine the factors that can lead to their success.<br>Bamboo waste valorization may create markets that will bring about additional opportunities and income for the different players in the bamboo industry and additional total value added to the supply chain, which ultimately will contribute to the creation of wealth from wastes being envisioned by the project. | IPs<br>Publication<br>Year 2<br>One (1) IEC material, i.e., information bulletin/brochure on utilization of bamboo harvesting and processing wastes:<br>Drafts of two (2) scientific articles for possible publication in peer-reviewed journals<br><br>Patents<br>Year 2<br>Invention disclosure application for the developed protocols for the production of nanosilica from bamboo harvesting and processing wastes<br><br>Products<br>Year 1<br>Nanosilica from bamboo harvesting and processing wastes<br>Year 2   | University of the Philippines Los Baños (UPLB)                       | The target beneficiaries of this project are bamboo processing companies, bamboo plantation farmers, related downstream industries, and consumers who are willing to use sustainable and environmental-friendly products from bamboo processing wastes.   | 01-Jan-23 | 31-May-25 | ONGOING                          | 4,999,782          | 2,101,250.50     |
|               | Greenhouse Gas Inventory of Industrial Tree Plantation (ITP) Production Chain in Mindanao (Phase 2)                          | Integrity of the environment and climate change adaptation and mitigation | In 2019, the UPLB-CFAR successfully completed a one-year DOST-PCAARRD-funded research project in Caraga Region. The study involved inventory of GHG emissions from ITP activities that include harvesting, minor and major log transport, and veneer and lumber production. It also included determination of carbon stored in durable wood products particularly lumber and veneer. However, due to budgetary and time constraints, the study focused only on the GHG accounting of harvesting activities, transport and primary processing of falcata into lumber and veneer. It excluded carbon stock assessment of falcata plantation and secondary wood processing including its wastes and by-products. Thus, there is a need to conduct a study covering the remaining ITP activities and processes in the production chain to be able to come up with the complete assessment of GHG fluxes in the sector and demonstrate its role in mitigating climate change and highlight its economic viability and contribution to sustainable forest resources management.  | Wood and bamboo<br>Year 1<br>1. List of cooperators and target small-hold tree farmers, ITP owners, and IFMA holders<br>2. Location map of small-hold tree farms, ITP, and IFMA study sites<br>3. Tree inventory and biomass samples of understory herbaceous (UH), litter/needlemass, and soils in selected study sites collected<br>4. Preliminary calculations on carbon stored in tree biomass, UH/litter/needlemass, root biomass and soils in selected study sites<br>5. Calculated GHG emissions from land clearing used for tree plantation development<br>6. Signed memorandum of agreement/ understanding between DENR and tree farmers, ITP owners, IFMA holders, and collaborating wood processing plants (WPPs)<br>Year 2<br>1. Calculated carbon stored in tree biomass, UH/litter/ needlemass, root biomass and soils in selected study sites<br>2. List of secondary wood processors<br>3. Types of secondary wood products produced by the ITP sector<br>4. Gathered samples on secondary wood products and their by-products for laboratory analysis<br>5. Preliminary calculations on GHG emissions from secondary wood and by-products processing<br>Year 3<br>1. Calculated GHG emissions from secondary wood and by-products processing<br>2. Carbon stored in durable wood products<br>3. Calculated total GHG storage and emissions from the ITP sector<br>4. Calculated net GHG fluxes from the ITP sector<br>5. Recommend protocols and policies to reduce GHG emissions from the ITP sector<br>6. Trained twenty (20) selected DENR and forestry school 's research staff, and wood processors/WPPs on GHG inventory in Caraga Region<br>7. Patent application on GHG inventory of ITP production chain<br>8. Two (2) journal articles on GHG accounting in ITP sector<br>9. Reference data on GHG emissions on various ITP harvesting operations and stored C on harvested wood products (HWP)<br>10. Determination whether plantations are net sinks or emitters of CO2 | University of the Philippines Los Baños (UPLB)                       | 1. DENR * for monitoring and evaluation and policy making<br>2. WPA * for monitoring and evaluation and policy recommendations<br>3. Partner SUCs * for training and research implementation<br>4. Small-hold tree farmers, ITP and IFMA holders/owners * for implementation/compliance and guidance<br>5. Local communities - for implementation/compliance and passing of ordinances/resolutions<br>6. Wood processing industries * for compliance and guidance | 01-Nov-21 | 31-Oct-24 | COMPLETED                        | 4,998,590          | 740,616.70       |

| 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, 2024 | Total Project Cost | 2024 PCAARRD GIA |
|---------------|--|---|---|--|--|--|-----------|-----------|---------------------------------|--------------------|------------------|
|               | Growth Stress Attributes and Measures to Minimize the Wood Defects of Falcatia (Falcataria moluccana (Mq.) Barneby & Grimes) Old Title: Growth Stress Attributes and its Measures to Minimize the Wood Defects of Falcatia (Falcataria moluccana (Mq.) Barneby & Grimes) | Integrity of the environment and climate change adaptation and mitigation | Falcatia (Falcataria moluccana) (Mq.) Barneby & Grimes tree plantation in Mindanao, Philippines is one of the lucrative ventures of tree farmers. Falcatia is widely planted throughout Mindanao and some parts of Visayas and Luzon islands, because of its demands for different wood products. Caganga Region, is declared as the timber corridor of the country as per DENR - DAO no. 99-13. The order supports the timber industry to enhance and develop by providing appropriate land for investment. The region has vast open lands, good climate, and environmental conditions ideal for tree plantations. Tree plantations as a common commodity for many decades made this a way of life for many Cagangaonans. In 2011, the region contributed 60% of the production for wood of the country. Sixty-seven percent (67%) of natural log production is from falcatia (Falcataria moluccana) trees (FMB-DENR, 2011). It is the major crop raised in the region. Its suitability to the site as exhibited by its fast growth rate, and the high market demand for plywood, lumber, poles and crates production that encourage more farmers to falcatia tree farming. The log demand of falcatia increased spontaneously because of the log ban as per Executive order no. 23 (Declaring a moratorium on the cutting and harvesting of timber in the natural and residual forests and creating the anti-illegal task force). Despite this demand the falcatia tree farmer recently experienced odd market price on logs because of the log defects e.g. radial cracks at the log-end and lumber crooking during harvesting, that depreciate the value of logs during marketing and this attributes also the low recovery of wood processing. These defects can be attributed to Longitudinal growth stress. Cazena & Soriano (2004) emphasized that Longitudinal growth stresses are present in all standing timber and cut logs. In fact, if they did not exist, trees could not maintain a vertical position. Growth stresses are not visible although they can be measured and are called growth strain (GS). When trees are felled and cut into logs and logs processed into lumber the results of growth stresses being released become evident. A study conducted by the USDA Forest service showed that on the average 12.6 percent of the potential lumber tally is lost due to multiple defects (Cahill & Copetta, 1986). Considering the total volume per hectare of falcatia that is 30' 40 m <sup>3</sup> /ha (Kisnerwal et al, 2011) and the price of falcatia per volume which is 4,500 per cubic meter (as reported by Director Ricardo Caldeon of DENR-FMB in a news article in 2016) an estimated 22,600 pesos/ha is lost due to wood defects. In response to the request of farmers and sawmill operators this study was formulated to investigate the influence of stress induced by growth orientation and provide measures to minimize the formation of radial cracks at the log-end and lumber crooking in both stem and branch and will describe the anatomical features of tension wood and normal wood of falcatia. | The Project will have the following Expected Outputs:<br>IPRs Metrics<br>Publications<br>One manuscript submitted for publication in peer reviewed journal<br>One paper submitted for publication in peer reviewed journal<br>Production of 200 inoculants/bacteria on protocol on how to reduce/minimize falcatia log defects<br>Patents<br>1 submitted application for utility model for protocol on how to reduce/minimize falcatia log defects<br>Products<br>Identified the Physical, and anatomical characteristics of 12 Falcatia (both tension and normal wood) for wet season<br>Identified the Physical, and anatomical characteristics of 24 Falcatia (both tension and normal wood) for dry season<br>Determine the SIRs and RR3 of 24 trees both wet and dry season (total of 1,248 strain measurements)<br>Two (2) experimental set up on the log treatment<br>1 protocol on how to reduce/minimize falcatia log defects<br>Result of benefit cost analysis of treatment to minimize defects<br>Determined the Juvenile to Mature Wood Transition of Falcatia<br>People and Services<br>1 MS student mentored and 3 undergrad students mentored<br>Places and Partnership<br>MOU between CMU and ERDB- FWRDEC<br>Policies<br>1 Policy brief about harvesting and post-harvest processing of falcatia   | Central Mindanao University (CMU)              | Tree farmers and private plantation owners in Mindanao, academes and researcher  | 01-Nov-21 | 31-Oct-24 | COMPLETED                       | 5,000,000          | 542,200.00       |
|               | Identification of agarwood-forming pathogen in Aquilaria species in the Philippines and agarwood induction   | Integrity of the environment and climate change adaptation and mitigation | Agarwood is a fragrant dark resinous wood formed in the heartwood of Aquilaria trees. It occurs in Aquilaria trees of the family Thymelaeaceae, with 68 recognized species in the Philippines. The tree has the unique feature of producing resin-infiltrated heartwood which is fragrant and economically highly valued depending on the oleoresin content of the wood. Agarwood is dubbed as wood of the Gods with immense cultural significance due to its use in incense ceremonies. The studies on the biological agents in resiniferous areas on the infection site of the agarwood trees revealed that the fungal microbes could be the potential agents that induce the formation of agarwood. As a response to the fungal infection, the tree produces a high resin in volatile organic compounds that aids in suppressing or retarding the growth of the fungus. As the fungi caused injury to the tree trunk, the tree underwent several biochemical reactions and produced a white, milky substance called oleoresin. Once the production of aromatic trunk or agarwood is complete, the tree slowly starts drying up, signaling its readiness to be harvested. It is understood that resin wood or agarwood is the result of oleoresin accumulation in response to fungal infection. However, little information is available on the potential fungi and its enzymatic activities that are associated with the formation of agarwood for Aquilaria species in the Philippines. However, bacterial communities were also found abundant and consistent with fungal communities in agarwood and their role in agarwood formation were reported. Thus, the project considered also the bacterial community in our project as subject of analysis. In this circumstance, correct identification of fungi and bacteria associated with agarwood formation is imperative so as to proceed to further research work on artificial inoculation of the biological agents on Aquilaria spp. so as to produce high amounts and quality agarwood<br>Indiscriminate harvesting of agarwood has severely affected natural regeneration of Aquilaria trees which in effect threatens the survival of the species in the wild. Thus, establishing the ability of the agarwood-forming pathogens to infect the species through artificial inoculation and reproduce similar symptoms will reduce the pressure on the natural population of Aquilaria trees. There is also a need to underpin growth of agarwood-producing Aquilaria tree to facilitate tree silvicultural management for efficient propagation and plantation establishment; hence, study on the close association of biotic and abiotic characteristics of the site where the infected tree is growing is necessary.   | IPSPublicationYear 1 & 2<br>Infographic material on agarwood formation<br>Infographic on agarwood Year 2<br>2 publishable articles in refereed/journal Patents Year 2<br>1 application for IPR on agarwood induction tech ProductsYear 1 & 2<br>2. Partial list of fungal and bacterial strains/species in agarwood of Aquilaria<br>Accession codes for deposited DNA sequences of fungal/bacterial strains/species in agarwood Year 2<br>Complete list of fungal and bacterial strains/species in agarwood of Aquilaria<br>Protocol on artificial agarwood production People ServicesYear 1 & 2 3 MS students (Forestry, Biology, Molecular Biology or Biotechnology/Microbiology) assisted by the project in the conduct of the study<br>1 Staff trained on molecular and microbiology techniques Places and Partnership Year 1 & 2 Continued partnership with FWRDEC-ERDB-DENR. Established partnership with selected State Universities/Colleges with similar research work. Established Collaboration with industry and private associations on Aquilaria tree farming 2sEconomic Impact Provision of additional income to tree farmers involved in agarwood collection and be able to assist industries venturing on artificial agarwood production and trade. Based on our potential collaboration with tree farm associations and other private industries, we are targeting a minimum of around 300 member farmers and interested potential investors Social Impact   | University of the Philippines Los Baños (UPLB) | Local communities, DENR, research and academic institutions, tree farmers/growers, industry  | 01-Aug-23 | 31-Jul-25 | ONGOING                         | 11,121,413         | 1,861,646.00     |
|               | Integration of Traditional and Modern Bioproduction Systems for Sustainable and Resilient Future Under Climate Ecosystems Changes (ITM&B)  | Integrity of the environment and climate change adaptation and mitigation | Consistent with the global and regional efforts towards pursuing a more sustainable and climate resilient development pathways, the Philippines National Climate Change Action Plan (NCCAP) comprehensively addresses the primary goal of increasing natural ecosystems' resilience to climate change to promote a climate risk-resilient Philippines.<br>The NCCAP identified seven strategic priorities to sustainable and climate resilient development pathways. These are food security, water sufficiency, environmental and ecological stability, human security, climate-friendly industries and services, sustainable energy, and knowledge and capacity development Climate Change Commission 2011).<br>This project is a multilateral cooperative research between Japan, Indonesia and the Philippines under the e-Asia Joint Research Project. However, the outputs enumerated in this project is exclusive to the Philippines only and hopes to contribute to the goal of NCCAP.  | Database of traditional and modern bioproduction systems in Japan, Philippines and Indonesia jointly developed by participating research team and made accessible online to other researchers following a specific protocol.<br>Framework document co-developed by project partners from Japan, Philippines and Indonesia and validated by key stakeholders detailing the process of creating multiple scenarios of bioproduction systems to determine sustainable and resilient future under climate and ecosystem changes. The framework can also guide the scaling up of the project to other areas in the participating countries for broader impacts.<br>Analytical report on the detailed assessment and predicted impacts on selected bioproduction systems under multiple future scenarios in the project areas in the context of climate change, demographic change and land-use change from 2021 to 2050.<br>Assessment report on the changes in ecosystem services in the project areas produced by selected modern and traditional bioproduction systems under multiple scenarios indicating the potential synergies and tradeoffs between ecosystem services.<br>List of interventions in the project sites to optimize ecosystem services within each scenario based on modeling outputs and consultations with different stakeholders.<br>Workable networking and communication platform developed and institutionalized among project partners in Japan, Philippines and Indonesia like shared data base, project weblogs, and project output dissemination plan that provides research outputs, policy recommendations, and training materials available to relevant stakeholders.  | University of the Philippines Los Baños (UPLB) | Researchers, academics, and students working on climate change, land use and demographic changes, and ecosystem services<br>Policymakers working on the environment and food security issues<br>Decision-makers like LGUs, national government agencies, and civil society involved in climate change adaptation and mitigation and ecosystem services especially those operating in the project areas<br>Private sectors and development agents with investments/development interventions in the project sites<br>Local communities depending on ecosystem services in the project areas | 16-Oct-21 | 15-Apr-25 | ONGOING                         | 17,405,392         | 2,378,844.00     |
|               | Isolation, Characterization, and Utilization of Functional Microbes in Fermentation and Physico-Chemical Analysis of Fermented Cacao Beans for Improved Quality  | Rapid, inclusive and sustained economic growth                            | Current practices of cacao beans fermentation in the Philippines generally generated inferior quality fermented beans based on the results of studies under NICER Cacao R&D Center. There is a need to develop fermentation protocols to generate high quality fermented beans. Functional microbes play significant roles in fermentation leading to enhanced and improved bean quality. There is a need to isolate, identify, and functionally characterize the microbes for utility in fermentation of cacao beans. There is also a need to develop other strategies for enhanced fermentation and increased quality of beans. To ensure production of quality fermented cacao beans, there is a need to assess the grade, sensory and physico-chemical properties of the processed beans.<br>The project is expected produce high-quality fermented cacao beans that command higher prices and increased profits for cacao farmer and processors; increase in demand of Philippine cacao fermented bean in domestic and export markets; and production of superior quality chocolates, tablets and other cacao-based value-added products both locally and internationally.   | IPs<br>MediaPublicationYear 1 At least 1 paper presentation in conference related to food microbiology and processingYear 2 At least 2 paper presentations in conferences related to food microbiology and processing At least 2 IC materials (Leaflets on microbial inoculants and brochures on new fermentation procedures)Year 3 At least 1 scientific paper and at least 2 paper presentations in conferences related to fermentation and processing At least 2 IC materials (Leaflets on microbial inoculants and brochures on new fermentation procedures) PatentsYear 1 At least 1 utility model/ patents filed for microbial inoculantsYear 2 At least 1 utility model/ patents for microbial inoculantsYear 3 At least 2 utility model/ patents for microbial inoculants and fermentation process ProductsYear 1 At least 1 functional microbes At least 1 microbial formulations/inoculantsYear 2 At least 1 functional microbial inoculants Year 3 At least 2 microbial formulations/inoculants People and Services At least 2 undergraduate and 2 MS graduate students At least 1 capacity building of at least 2 cacao growers association on improved postharvest processing technologies Place and PartnershipYear 1 to 3 At least 1 Partnership with Department of Agriculture Region 11 and 12 Year 3 At least 1 Training of DA staff on developed inoculation strategies Policy Year 1 At least 1 Policy recommendation on utilization of inoculants 2sEconomic Impact Enhanced competitiveness of cacao and cacao-based products in the international market Increased bean price by at least 20% Increased income of cacao farmers and processors of at least 20% due to improved processed bean quality Social Impact eg clean/NoKormat/ sylet/margin-top:margin-right:0px;margin-bottom:0px; margin-left:18.0pt;margin | University of Southern Mindanao (USM)          | Cacao farmers, bean processors, cacao and cacao-based product manufacturers  | 01-Apr-24 | 30-Sep-26 | ONGOING                         | 13,888,726         | 6,451,140.20     |

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|---------------|---|---|---|---|--|---|-----------|-----------|----------------------------------|--------------------|------------------|
|               | Landslide Susceptibility Analysis, Monitoring, Mapping and Early Warning Systems for Selected Areas in the Cordillera Administrative Region | Integrity of the environment and climate change adaptation and mitigation | Landslides has become a major threat in CAR. Almost yearly, landslides occur induced by storms or major typhoons. Many occur outside of local residences and villages thus avoiding casualties and other adverse impacts. Occasionally, landslides occur in population centers often resulting in significant losses of lives and infrastructures, including buildings, roads, bridges and others. Because of the potential for extensive damage and high risk of lives when landslides occur, systematic efforts to investigate concepts and frameworks for forecasting landslides must be developed. This will help in better understanding of landslides and the causal factors that cause or trigger their occurrence.<br><br>This project offers a strategic approach to addressing landslides by focusing on the root causes, the trigger factors, and the likelihood or probability of occurrence and the causes. Such knowledge, once generated by the project, will allow better understanding of the phenomena and its dynamics, and ultimately enables the development of early warning systems. Such an early warning system enables agencies and local organizations to be better prepared, better informed, and affords them the opportunity to be proactive before and during the onset of major storm events, which appear to be the triggering event when landslides occur. Such capability ultimately provides better safety for the local communities, and potential economic benefits to local governments by minimizing economic costs of reconstruction if no mitigative actions are undertaken. Such actions can be planned in advance if advance warnings can be provided by the early warning system which is one of the ultimate outputs of this project.   | Publications<br>Two (2) Publishable articles submitted (ISI and/or SCOPUS Journal)<br>Patents/IP<br>Copyrighted project brochures<br>Patent application for UM on Landslide EWS developed<br>Product<br>1 geographic database and platform on landslide EWS developed; copyrighted project brochures<br>1 Landslide Early Warning System prototype developed<br>People Services<br>9 trainings for technical staff and 80 professionals (PIMDRRM and PIMPD Officers and researchers) on landslides GIS mapping and database development; landslide inventory survey spatial data generation; analytical tools modeling and mapping; rainfall-induced thresholds development and landslide EWS development conducted<br><br>Places and Partnership   | Benguet State University (BSU)                                       | 1x2 Some of the more notable beneficiaries of the Project are: the local government units such as DRRMO and Planning and Development Office and their local constituents who are likely to benefit from the early warning systems and the likelihood that preemptive plans can be put in place in terms of proper advisories that can be given to them in advance or prior to the likelihood of landslide occurrence. Other beneficiaries also include professionals who are trained on the different concepts, principles, and tools in landslide assessment, monitoring and early warning systems.  | 01-Nov-22 | 30-Apr-25 | ONGOING                          | 4,999,442          | 1,205,610.40     |
|               | Mangrove-sediment-microorganism carbon dynamics to enhance CO2 sequestration capacity of Mangrove forests                                   | Integrity of the environment and climate change adaptation and mitigation | Mangrove ecosystems are one of the most critical ecosystems along continental margins that provide valuable economic and ecological services. Because of the vital ecological services, vulnerable coastal communities strongly depend on the fishery resources available in mangrove ecosystems. These ecosystems function as nursery grounds and food sources for both terrestrial and aquatic fauna (SDG 14 & 15), support livelihoods (SDG 2), and protect coastal areas against disasters caused by typhoons, hurricanes, and tsunamis (SDG 13). Among tropical wetlands, mangrove forests have the highest carbon stock, and 49-98% of this carbon stock is stored in their sediments. The high carbon stock is a result of the high net primary productivity of mangroves, and their location in depositional areas also makes them effective traps of organic matter inputs from the terrestrial and marine environments. Mangrove ecosystems are efficient carbon sinks due to their high capacity for long-term carbon sequestration through the burial of OC in sediments. However, the mechanisms of the burial of OC in mangrove sediments and the microbial community in mangrove sediments remain poorly understood and thus remain elusive. Thus, understanding the mangrove-sediment-microorganisms carbon dynamics is an integral component in the conservation and rehabilitation of mangrove ecosystems in the Philippines that are indispensable in climate regulation to help counterbalance the anthropogenic carbon emissions.<br><br>Beyond evaluation, this research will provide baseline information on mangrove-sediment-microorganism carbon dynamics in Philippine mangroves important in understanding the long-term carbon sequestration. Bioquarrying, and bioabundant in this project can contribute to providing data and information on mangrove sequestration capacity of mangroves as input to the country's National Determined Contributions (NDC) being submitted by the Philippine government to the UNFCCC. | Publication<br>Project brochures and flyers<br>Press releases on the progress of the project<br>Three (3) Publications in ISI-indexed journals related to environmental, monitoring, assessment and conservation<br>Presentation of results in national or international conferences<br><br>People and Services<br>Trained project staff and involved LGU's MENDRO Staff on mangrove-sediment-microorganisms carbon dynamics data gathering, monitoring and analysis.<br>One (1) PhD, two (2) MS theses and 5 undergraduate theses supported.<br><br>Places and Partnerships<br>MOA/MOUs in collaboration with DENR-ERDB-FWERDEC, Surigao State College of Technology, Caraga State University, Southern Leyte State University, MSU-Iligan Institute of Technology, and Surigao del Sur State University and Hinatuan, Comar and Masan City LGU<br>Partnership with academe forged through student training and thesis assistance<br><br>Patents/IP<br>Copyright of a training manual on mangrove-sediment-microorganisms carbon dynamics data gathering, monitoring and analysis<br>Patent application for CO2-CH4 flux model incorporating microbial activity, dissolution-precipitation, carbonation and filter production-deposition<br><br>Product<br>Process, knowledge/know-how/information on mangrove-sediment-microorganisms carbon dynamics<br>Training manual training on mangrove-sediment-microorganisms carbon dynamics data gathering, monitoring and analysis | Southern Leyte State University (SLSU)                               | 1. Researchers * researchers involved in this project will be able to produce scientific publications and assist them in capacity-building integral in nation building.<br><br>2. Local government units, government agencies, non-government, organizations, HEIs * this project will serve as baseline information for policy formulation of government agencies and local government units in managing and understanding the importance of mangrove in carbon sequestration.<br><br>3. Philippine government * provide data and information on sequestration capacity of mangroves as input to the country's NATIONAL DETERMINED CONTRIBUTION (NDC) being submitted by Philippine government to the UNFCCC.  | 01-Sep-23 | 31-Aug-25 | ONGOING                          | 4,903,612          | 1,117,156.30     |
|               | Production and Biodiversity Conservation of Wild Tea Plants in Mountain Province  | Integrity of the environment and climate change adaptation and mitigation | In Mountain Province, five plants are consumed as tea and are generally called and considered as wild tea. These wild teas are present in different municipalities, namely, Cinnamonum mercaos S. Vidal locally called ukumayo and Galuilla leucocarpa var. cumingiana (S. Vidal) known locally as cabuyotog in Bantay, the Cassarea sanki (Perr.) J.F. Molina var. molle (Merr.) J.F. Molina known as agulmo found in the boundaries of Baako, Descasapemum fruiticosum (J.R. Forst and G. Forst) in Bontoc that locals call mountain tea, and Glycyrrhiza pentaphylla growing in Sagada with a local name as tea. Local communities gather the leaves from the wild and consume them as tea. The natives claim that they use it as local medicine such as to ease diarrhea or any stomach pain and prevent coughs and colds. In addition, Neesinger (2022) has also reported that these wild tea plants have the potential as antioxidant, antibacterial and anti-tumor sensing values. This project aims to assess the diversity and ethnohistorical importance of the wild tea plants their morphological characteristics including species distribution, habitat and site suitability assessment and mapping. In addition, the project will also examine their propagation, production, and management. Moreover, the project will also analyze biodiversity conservation and management strategies for selected wild tea plant species to ensure their sustainability, management, and use. Such strategies include exploring and mapping their distribution, studying their habitat, and studying the site suitability where they are likely to grow well. Finally, the project will also conduct feasibility studies to examine the technical and financial viability of wild tea products, along with a value-chain analysis that will examine the production efficiencies of the wild tea products and the potential entry points for subsequent development of a tea business industry for Mountain Province.                                | Policy<br>1. Publication - Draft IEC materials like technology guides for production of osetane products and field guides on selected wild tea plants- 3 articles submitted for publication in the last year of the project such as the ethnohistorical assessment, morphological characterization and standardization of processing methods for quality selected wild teas. 2. Patent - 3 copyrights of the research studies 2 copyrights of the 2 research studies specifically on the ethnohistorical assessment, morphological characterization and 1 copy copyright of the developed field guides of the selected wild tea plant species submitted. 3. Product - 3 wild tea products developed on the last year, specifically the last quarter of the year. 4. People and Services - 1 capacity building training on processing and production techniques on year 2. - 1 capacity building activities on the propagation techniques of the wild tea plants on year 2.5. Place and Partnership - 1 coordination with government agencies like DTI etc. for support in financing and regulation on year 2. - 1 partnership with LGUs for the conservation of the wild tea plants on year 16. Policy - 1 policy recommendation regarding the wild tea conservation and management on year 2.  | Mountain Province State Polytechnic College (MPSPC)                  | The target beneficiaries of this project are those who are organic tea drinkers especially the health-conscious ones and all other customers who will patronize the products, tea growers who are willing to propagate the wild tea plant species, profit sharing for the distribution channels that will link our products to our customers (tea drinkers) and during the production of the product, employees that will be hired for the production management. Tea growers will be provided training on plant propagation and field management to enhance their knowledge of crop production while some will be trained in product development processing. These measures would not only enable the tea growers to meet the growing demand for products sourced from sustainable and responsible farming, but also improve the yields and productivity on their lands. Specifically, the beneficiaries include: - local government units of Mountain Province - MPSPC - Indigenous Peoples of Mountain Province - Micro Small and Medium Enterprises (MSME's) - DENR-PENRO | 01-Dec-23 | 30-Nov-25 | ONGOING                          | 4,410,873          | 1,534,787.90     |
|               | Production of bamboo pellets for sustainable and alternative source of energy using commercial bamboo species in the Philippines            | Rapid, inclusive and sustained economic growth                            | According to the United Nations, there is a growing coalition of countries, cities, businesses and other institutions that pledged to eliminate their carbon emissions to net zero including the biggest polluters: China, the US and EU. This agreement opened up for a growing market demand for renewable energy sources such as biomass pellets which is expected to reach valuation of USD 31 Bn by the end of 2030.<br><br>The Philippines, which has abundant supply of bamboo for biomass pellet production, has huge potential to enter the market. However, preliminary studies showed that bamboo pellets manufactured in the country require further research so that the properties will meet existing wood pellet standards. The bamboo pellets produced has high C and S. The qualities of the bamboo pellets must be improved at par with other exporting countries so Filipino companies can compete with and enter the biomass pellet global market.<br><br>The study is aligned to the national SAT priorities of the government, i.e., conduct research in (1) forestry and natural resources; bamboo and (2) renewable energy solutions. Once successfully will generate green jobs, income to micro, small and medium enterprises, and improvement of gender equality in the country. This will also add to the nationally determined contribution of the Philippines in reducing carbon emissions.   | Publication/Year 13 local publications/1 poster/Year 2 3 local publications/1 press release/Patent/Year 11 copyright filed/Year 21 utility model filed/Products/Year 16 bamboo pellet products (one for each species)/Year 26 processes of optimized production of bamboo pellets (one for each species)/People Services/Year 15 student/on the job trainees Year 25 CS First Green ADO personnel to be trained through a workshop/Places and Partnership/Year 11 partnership with a university (Laguna State Polytechnic University)/Year 21 partnership with a private company (CS First Green ADO)   | DOST-Forest Products Research and Development Institute (DOST-FPRDI) | The target beneficiaries of the project are industry partners especially bamboo industries, policy makers, government institutions, and biomass and renewable energy sectors.   | 01-Mar-23 | 28-Feb-25 | ONGOING                          | 4,606,324          | 877,488.00       |

| 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, 2024 | Total Project Cost | 2024 PCAARRD GIA |
|---------------|--|--|---|--|--|--|-----------|-----------|---------------------------------|--------------------|------------------|
|               | Production, Characterization, and Potential Applications of Biodegradable Plastic from Bamboo (BambuPlastic)   | Rapid, inclusive and sustained economic growth | Plastics are versatile materials as evident of its use in our everyday lives including packaging, construction, transport, electronics, etc. It's clear that modern life would be very different without them. Since plastics are so durable and don't corrode, they create considerable disposal problems. This can be attributed to the stable long polymer chains of petrochemicals. They aren't good for the landfill, as many will persist for hundreds of years. When plastics are incinerated, dangerous gases can be produced. In addition, out of staggering 2.7 million tons of plastic waste generated in the Philippines each year, 20 percent of which is estimated to end up in the ocean (McKinsey, 2015).<br><br>To address the problem, works are continuously being conducted to replace the conventional petrochemical-based plastics with bio-based or biodegradable materials that are environmental-friendly. One of the possible sources of biomass for the production of biodegradable plastics is bamboo.<br><br>In a previous study supported by the Philippine Council for Industry, Energy and Emerging Technology Research and Development (PCIEERD) cellulosic micro- and nano-crystals and fibrils from bamboo were extracted and were incorporated in starch and nylon fibers. Improvements on the properties of the films were observed. However, these products just used minimal amount of bamboo (~12%). In addition, lignin was not used utilized.<br><br>In a related completed research project funded by Philippine Council for Agriculture, Aquatic and Natural Resources Research (PCAARRD) both cellulosic materials and lignin were extracted from Industrial Tree Plantation Species (ITPS). The cellulosic materials were used as additive to starch and polyvinyl acetate (PVA) while lignin was used as an additive to epoxy and polyvinyl acid. In the studies, cellulose and lignin were used separately and involved the use of only up to 10% of each of the materials.<br><br>This research proposal intends to use the lignocellulosic materials from bamboo by regeneration of lignin and recombining it with cellulose in a simple and direct process. Majority of the cellulose and lignin will be retained and will be converted to a plastic-like material.<br><br>The development of high value bamboo products is one of the priority programs as specified in the Industry Strategic S & T Plan prepared by PCAARRD-DOST. The planting of bamboo is desirable from both an environmental and economic standpoint. Bamboos provide cover to forested uplands and enable farmers to earn income from their planting and harvesting upon maturity.<br><br>The project is aligned with the government's thrusts of poverty reduction and empowerment of the poor targeting the development of an alternative product from bamboo for the benefit of farmers who | Publications<br>Year 1<br>One (1) IEC material, i.e. information bulletin/brochure about the chemical properties of bamboo and its potential for the production of biodegradable plastic<br>Year 2<br>Two (2) scientific articles submitted for publication in peer reviewed journal<br><br>Patents<br>Year 1<br>Trademark for BambuPlastic and/or BambuPlastik<br><br>One (1) invention disclosure application for the developed protocol for the production of and the product BambuPlastic<br>Year 2<br>One patentability developed protocol for the production of and the product BambuPlastic<br><br>Products<br>Year 1<br>Protocols for the extraction of lignocellulosic material from bamboo and production of biodegradable plastic sheets from bamboo<br>Year 2<br>Biodegradable plastic with optimized properties<br><br>People Services<br>Year 1 and 2<br>One (1) graduate student<br>One (1) technical personnel trained<br><br>Places and Partnership<br>Year 1<br>Improvement of the FPS Forest bio-Materials Research Laboratory<br>Year 2<br>One (1) partnership with bamboo plantation owners/farmers or bamboo processing plant in the form of MOU or MDA<br><br>IPAs<br><br>Year 1<br><br>Year 2<br><br>Publication<br><br>Two (2) Draft articles for publication<br>Topic:<br><br>Two (2) ISI- and/or SCOPUS- indexed publications<br>High impact factor journal publication<br>Industry Article Citation Impact (i.e., the influence and impact)<br><br>Patent  | University of the Philippines Los Baños (UPLB) | The target beneficiaries of this project are the bamboo plantation developers and farmers, bamboo processing plants, plastic manufacturing plants, and consumers who are willing to use sustainable and environmental-friendly products.   | 01-Apr-23 | 31-Mar-25 | ONGOING                         | 4,998,838          | 1,784,997.20     |
|               | Propagation and conservation of the top priority plants in the forests over limestone of Samar Island Natural Park, Samar Island, Philippines  | Rapid, inclusive and sustained economic growth | This project proposal will provide insight into the propagation of the top priority species for conservation in the forests over limestone of Samar Island Natural Park (SINP). The top priority species were identified by Bust et al. (2023) based on their harvesting risk, economic and cultural uses, and species distribution and frequency values. Most of these priority plants are understudied, hence information related to their propagation are lacking. Inability to reproduce these species may lead to their decline and possible extinction. Thus, it is important to determine the best propagation method that will allow us to conserve and use these priority species in a sustainable manner. Propagation of the top priority plants for conservation will be an effective technique for increasing and sustaining the population size of these species in SINP. This study will also provide a better understanding of the biology of the top priority species. Furthermore, the findings of this study will be communicated to stakeholders to ensure the reproduction of the priority species in their area and to promote plant propagation as a potential source of income for the local communities.  | IPAs<br><br>Year 1<br><br>Year 2<br><br>Publication<br><br>Two (2) Draft articles for publication<br>Topic:<br><br>Two (2) ISI- and/or SCOPUS- indexed publications<br>High impact factor journal publication<br>Industry Article Citation Impact (i.e., the influence and impact)<br><br>Patent   | University of the Philippines Los Baños (UPLB) | Local Government Units (LGUs) of Paranas, Peoples Organization (POA's, etc.), residents in Paranas and the general public.   | 01-Oct-24 | 30-Sep-26 | ONGOING                         | 5,000,000          | 2,714,932.25     |
|               | Prospecting Natural Insecticides and Preservatives: Phytochemical Analysis, Insecticidal Activity and Preservative Potential of Extracts from Tropical Trees and Weedy Plant Species Against Powder Post Beetles ( <i>Dinoderus minutus</i> Fabricius) | Rapid, inclusive and sustained economic growth | The proposed project is in support to the NIGER Bamboo Research and Development Center of Central Mindanao University (BRDC-CMU), which is a collaborative endeavor aligned with the Bamboo S&T Roadmap, particularly on the development of novel products. This research will focus on exploring four tropical trees and five invasive weedy plant species that have potential as natural insecticides against bamboo borers specifically powder post beetle or PPB ( <i>Dinoderus minutus</i> Fabricius). As a multipurpose and economically important crop for the country, it is essential therefore to address the threats (e.g. biotic threats) that might affect the quality and service life-span of bamboo and its derived products.   | Publication:<br>Year 1: 1 article submitted/Year 2: 1 article submitted/Year 3: 1 article submitted; 5 IEC materials regarding natural preservative<br>Patent:<br>By Year 3A, there should be at least 1 submitted utility model application (i.e., an effective plant extract as insecticide against PPB and/or as preservative)<br>Product:<br>In Year 1: Plant samples of 8 tropical trees and weeds plant species collected from around CMU and/or from farmer's areas with their permission and consent; Plant extracts with potential insecticidal activity against PPB; At least 50 individuals of reared PPB in Year 2; Data on bioefficacy of plant extracts; plant extract with insecticidal action against PPB screened for phytochemicals; 2 plant extracts tested for efficacy in vivo by partner local industry sectors<br>Year 3: 1 effective formulation of plant extract with high potential as insecticides and/or preservatives; 1 metabolic profile of plant extract with effective insecticidal activity and/or preservative capability; 1 plant insecticide/preservative product subjected to stability testing<br>People:<br>In year 1, 5 students mentioned.<br>In year 2, 5 students mentioned.<br>In year 3, 5 students mentioned.<br>Place and Partnership:<br>In year 1, 1 MDA forged with a local bamboo processing industry (Homebiz crafts in Iligan) for the initial test of plant extract<br>In year 2, 1 MOU with another institution for collaborative chemical analyses/Policy:<br>In year 3, 1 policy brief draft on significant reduction on use of synthetic chemicals to treat bamboo against D. minutus | Central Mindanao University (CMU)              | Researchers, students, bamboo products manufacturers (and consumers of bamboo products), LGUs of communities with the local bamboo industry. Any sexual orientation and gender identity will not hinder the involvement of the interested participants and beneficiaries of the project. | 16-Jul-24 | 15-Jul-27 | ONGOING                         | 5,000,000          | 2,334,560.00     |
|               | Quality Assessment of Bamboo fibers from two economically important bamboo species for textile production  | Rapid, inclusive and sustained economic growth | Bamboo is still an emerging technology at the Institute, as evidenced by four (4) PCAARRD-GIA-funded initiatives under the Bamboo Textiles PH trademark. Research and development activities on the development of bamboo textile fiber began in 2015, and DOST-IT-IRI devised the fiber extraction procedure for Philippine bamboo types and determined its textile potential, in accordance with the Institute's goal of creating more sustainable products.<br><br>In the pursuit of sustainability and improvement of the existing innovations of the Institute on bamboo as a textile material, the project aims to establish a plantation of selected bamboo species such as Giant Bamboo and Kawayan-Tink to assess the harvested potential in producing bamboo textile fiber (BTF). Along with pineapple, banana, abaca, and Philippine silk, the implementation of the project will serve as an extra consideration for bamboo to be included in the Implementing Rules and Regulations for Republic Act 6242. The goal of establishing a bamboo plantation is to ensure the long-term viability and availability of bamboo fiber extraction and manufacturing to meet the growing demand in the Philippine textile industry as well as determine the optimal age (6 months, 1 year old, 1 1/2 year old, and 2 years old) and morphological section (top, middle, bottom) of two (2) bamboo species for textile use. Results from previous bamboo projects have revealed that Giant bamboo is the best species for fiber extraction due to its high fiber retention, whereas Kawayan-Tink is a model bamboo species.   | Publication/Two (2) peer-reviewed technical papers<br><br>Patents/One (1) IP/Utility model Products: Year 1300 bamboo seedlings produced/Established bamboo plantation for D. asper and B. blumeana Year 2: Information on fiber yield of the 8 mos old D. asper and B. blumeana * At least 10 kilograms of fiber extracted/Information on fiber yield of 1 yr old D. asper and B. blumeana * At least 10 kilograms of fiber extracted/Year 3: Information on fiber yield of 1.5 yr old D. asper and B. blumeana * At least 10 kilograms of bamboo fiber extracted/Information on fiber yield of 2 yr old D. asper and B. blumeana * At least 10 kilograms of bamboo fiber extracted/Data on fiber and yarn properties of D. asper and B. blumeana People: At least 10 students/ staff trained in bamboo fiber extraction technology Partnership:  | Central Mindanao University (CMU)              | Farmers/farming communities<br>Fiber Producers<br>Garment manufacturers<br>General Public<br>Fashion design industry<br>Government employees   | 16-Jan-23 | 15-Jan-26 | ONGOING                         | 5,000,000          | 1,598,552.00     |



| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---------------|--|---|--|---|--|--|-----------|-----------|----------------------------------|--------------------|------------------|
|               | Real-time Carbon Flux Monitoring in Mangrove, Natural, and Plantation Forests in Mindanao, Philippines: An Eddy Covariance Approach                              | Rapid, inclusive and sustained economic growth                            | In this era where the carbon sequestration ability of forests is being tracked for each member country's commitment to the Kyoto Protocol and other climate accords, it is imperative to conduct studies that align with the global standards of carbon sequestration methodologies. This is important because tropical forests like in the Philippines have huge potential to mitigate climate change through the conservation of existing carbon pools (e.g. reduced impact logging), expansion of carbon sinks (e.g. reforestation and agroforestry), and a vast mangrove forest areas that store huge amount of soil carbon. However, the Philippines still used conventional destructive sampling to determine the stored carbon in vegetation and soils on a tree-level smaller plot area. Challenges remain in determining the carbon sequestration and emissions in real time in situ in larger areas at ecosystem level. The country needs a more accurate carbon measurement tool indelimiting the carbon sequestration and emission potentials in a larger scale.<br><br>In the context of greenhouse gas inventories and monitoring, the country lacks the needed data on various forest ecosystems in terms of ecosystem level carbon fluxes. These data are crucial in setting standard measurements of the carbon sequestration potentials of these critical ecosystems in the context of Nationally Determined Contribution (NDC) of the country. The Philippines submits its NDC in accordance with Decision 1/CP.21 of the Conference of Parties of the United Framework Convention on Climate Change (UNFCCC). Thus, a modern way to estimate carbon fluxes in various forest areas is necessary to provide accurate baseline data for decision-makers. This project is a stepping stone towards a modern era of carbon inventories where climate change officers can be provided with reference data from the gold standard state-of-the-art facilities such as the Eddy Covariance System. In addition, this project will determine the detailed coupling of land surface-atmosphere-water continuum in carbon fluxes, enabling more precise determinations of the role of Philippine forests (as sources or sinks).  | Publications<br>- Prepare at least (1) manuscripts for publication to ISI/Scopus indexed journals<br>- 2 manual guides prepared:<br>1. Manual guide for eddy covariance establishment<br>2. Manual for using the carbon-cinrate models<br><br>Patents/IP<br>- Submit at least one (1) IP protection (Copyright, Patent, etc.)<br><br>Products<br>- One (1) portable tower (to be moved 3k in plantation, natural and mangrove forests)<br>- Three (3) vegetative monitoring plots (plantation, natural, and mangrove)<br>- One (1) database of carbon fluxes, climate data and supplemental vegetation data<br><br>- One (1) Publications                 | Ecosystems Research and Development Bureau (DENR-ERDB) | Beneficiaries 1. Policy Makers/LGU leaders/Climate Change Commission (Can be provided with policy recommendation and decision support tools to enhance major forest ecosystems' carbon sequestration potentials. Results will aid in determining appropriate management intervention and measures to ensure a continuous flow of carbon data as NDC for UNFCCC and other carbon treaties. These beneficiaries can also be provided with updated and accurate National GHG inventory data)2. Researchers, Academe, local community (Can be provided with publications, maps, a website with online tools, carbon data/information, and capacity building activities)3. Graduate Students/Young researchers (Mentorship and training, hired as research analysts)4. Carbon traders/investors (carbon data needed for negotiations, others) | 01-Aug-23 | 31-Jul-26 | ONGOING                          | 13,971,917         | 2,616,679.00     |
|               | Rehabilitation and Streambank Stabilization of Catubig River Through Vegetation Engineering Systems Using Bamboo, Nipa, Annona glabra (pond apple), and Mangrove | Integrity of the environment and climate change adaptation and mitigation | The proposed project is an intervention for the Catubig river rehabilitation utilizing vegetation engineering systems through the establishment of bamboo, nipa, Annona glabra and mangrove to control streambank erosion that will stabilize the riverbanks. After stabilization of the riverbanks and successful plantation establishment, utilization of these resources will be pursued in order to gain economic benefits by continuously producing marketable products that could augment the income to farmers through sustainable use of these resources. For several decades, Catubig river continuously deteriorated due to population pressure, enhance economic activity in Catubig Valley and with the recurring weather disturbances due to climate change. The current state of the river is the result of the collective practices and that produce major damage to the Aquatic environment due to pollution from solid waste, animal waste, toxic chemicals, sedimentation, conversion, inorganic fertilizer run off and environmental aesthetic degradation. Study of Rebadulla (2004) revealed that the river very low species diversity indices between 0.09 to 0.14 at different sampling areas along the river. Similarly, showed severe stream bank erosion and siltation along the stretch of the river. After heavy rain, water became muddy indicative of erosion in the upper stream. Recently, climate change brought in prolonged high-intensity rainfall and frequent typhoon and low-pressure weather system that causes flooding affecting most of the barangays in Catubig valley. In Catubig alone, 45 out of 60 barangays are prone to flooding. In addition, 70% of the area in Catubig are classified under moderate to very high susceptibility to landslide or streambank erosion (CENRO/UEP). With climate change impact to Catubig valley, communities are very vulnerable that further aggravate poverty situation in the area.  | Year 1<br>1 brochure and 2 press releases/articles about the project<br>Year 2<br>2 promotional materials published<br>2 articles published (Data base on streambank status and impact different plant-based bioengineering strategies in stabilizing riverbanks and erosion prevention)<br>Year 3<br>1 paper for presentation in a seminar or symposium<br>2 technical papers for publication in refereed journals<br>Manual on Bioengineering Protocol on Streambank Rehabilitation and Stabilization using the species used in the project and Training Manual on Nursery Establishment and Planting of the species used in the project<br><br>Patents | University of Eastern Philippines (UEP)                | Clientelles<br><br>Expected Outcome / Effects Of The Project Output<br><br>Thirty (30) trained farmers on bamboo, nipa, Annona glabra, and mangrove propagation and its use on streambank stabilization to prevent erosion along the Catubig River, Thirty (30) trained LGU agricultural technicians, Three (3) municipalities of Northern Samar, namely, Las Navas, Catubig and Lasing.<br><br>Rehabilitation and streambank stabilization of Catubig River through vegetative engineering systems using nipa, bamboo, Annona glabra, and mangrove. At least one (1) farm area will be identified as site for field trials and rehabilitation.  | 01-Jan-23 | 31-Dec-25 | ONGOING                          | 4,967,992          | 1,315,864.00     |
|               | Saving the Globally Important and Critically Endangered Lycophyte, Isoetes philippinensis Merr. & Perry (Isoetaceae) in Olangu River, Lanao del Norte            | Rapid, inclusive and sustained economic growth                            | Isoetes philippinensis Merril & Perry, commonly known as Escalibon, and locally called as Isakansay or Isakansay, stands as a critically endangered and site endemic lycophyte and was reported to be extinct in the wild after its last documented collection in 1965. Its global importance is profound as this is the only species found in the Philippines and Southeast Asia. Its recent rediscovery in the headwater of Baloi River, Lanao del Norte (Amoroso et al., 2022) calls for a more comprehensive investigation of its unique habitat and biology. The critically endangered status of Isoetes philippinensis is equally alarming as the threat it confronts, as its habitat faces various challenges, including water pollution, disruption from mobile and parked pump boats, presence of invasive species, and anthropization (Amoroso et al., 2022). With these threats and its global importance, there is a need to safeguard the remaining population of Isoetes philippinensis by declaring the headwater of Olangu River as a critical habitat Isoetes philippinensis as a vascular indeoposporous lycophyte with a unique habitat as they are submerged aquatic plants, thriving in the bottom of the headwater of Olangu River, Lanao del Norte. It has a simple morphology consisting of a compact stem (corm), leaves with a single vein and arranged in a spiral forming a rosette and sunken sporangia. Its unique evolutionary history makes it more interesting in that Isoetes is the only genus of the Isoetaceae family, already present during the Jurassic period (Pigg, 2001). This research will investigate the distinctive habitat of Isoetes philippinensis and surrounding areas with the following objectives: (a) assessment and extensive inventory of plants and animals located in the headwater of Olangu River and surrounding areas; (b) describe its morphology, ecology through its quantitative and qualitative characters; (c) analyze the physico-chemical properties of the water; (d) conservation will also be implemented through in situ and ex situ strategies; (e) enhance awareness regarding the biology of I. philippinensis by preparing CEPA materials; and (f) development and management plan will be prepared to declare the headwater of Olangu River as a Critical Habitat. The objectives will be achieved by: (a) following the proper entry protocol; (b) site and species assessment will be done by documentation and collection for taxonomic studies; (c) the water's physico-chemical properties such as its temperature, pH, electrical conductivity (EC), turbidity, dissolved oxygen (DO) and total dissolved solids (TDS) will be measured; (c) in situ conservation will be done by ocular survey for colony counting and population's area of occupancy; and ex situ conservation through propagation of mature mother plants originating from the unique habitat and from spores; (d) CEPA materials will be prepared in the form of flyers, posters or pamphlets for dissemination; and (e) present research results to major stakeholders and recommend science-based policies for the legislation of Olangu River as a Critical Habitat in a 2-year period; this research will deliver the following outputs: (1) One scientific article and two CEPA materials; (2) Ex situ propagated plants of Isoetes philippinensis; (3) One utility model (UM) for spore propagation protocol; (4) The Maranao expedition; (d) Strong partnerships with the local officials of Brgy. Angayan, Municipality of Baloi, Lanao del Norte Province and the CENRO of DENR; and (6) Science-based policy | 6Ps<br>Year 1<br>Year 2<br><br>Publication<br><br>Draft articles for publication:<br>- 1 paper<br>- One scientific article<br>Two Communication, Education and Public Awareness (CEPA) Materials<br><br>Submitted for Publication:<br>- 1 paper<br>- One scientific article<br>Two Communication, Education and Public Awareness (CEPA) Materials   | Central Mindanao University (CMU)                      | The Maranaos of Brgy. Angayan, Baloi-L, Lanao del Norte<br>LGU officials of Brgy. Angayan and municipality of Baloi<br>Community Environment and Natural Resource Office (CENRO) of the DENR<br>Tourists/guests<br>Teachers and students of Balut Primary School   | 01-Oct-24 | 30-Sep-26 | ONGOING                          | 4,994,333          | 3,489,838.79     |
|               | Smart Cacao Budwood Nursery and Greenhouse for Production of High-Quality Planting Materials   | Rapid, inclusive and sustained economic growth                            | Cacao (Theobroma cacao L.) is one of the world's most valuable tree cash crops. World Cocoa Foundation (2014) estimates that global cocoa production is roughly 5 million tons per year, with 60 percent coming from smallholder farms, resulting in a total export value of \$9 billion (ICCO 2020a). By 2020, worldwide cacao demand is expected to reach 4.7 million to 5 million metric tons (DA, 2016). The Philippine Statistics Authority has reported 5,342 MT from 31,265.36 hectares in 2020. In comparison, Ivory Coast produces one million metric tons per year, Ghana produces 800,000 metric tons per year, and Indonesia produces 400,000 metric tons per year. Cacao production is constrained by several factors including low yielding cultivars, a lack of quality planting materials, a limited area of cacao production, a lack of awareness and technical know-how about improved technologies, limited technical support, and a lack of access to market information and high-value markets. To boost cacao production in the country, efforts are needed to expand cacao producing areas as well as plant high-yielding varieties. Cacao varieties such as UF18, BR25, UTT1, K1, IC540, K2, K3, PT, DRI, SB, FRC121, USMCH1 and USMCH2 are recommended by the National Seed Industry Council (NSIC). Due to their excellent yielding capacities, UF18 and BR25 are the most preferred among these. Furthermore, Cicoilo, is one of the most widely grown chocolate cultivars because of its exquisite flavor and aroma (Mauaso et al. 2018). Through the PCAARRD funded projects in cacao (Functional Genomics-assisted Development of Cereb Markers for Economically Important Traits in Cacao Production and Varied Improvement), (Validation of Molecular Markers for Identification of Cacao HYVs, Cicoilo Types and Disease Resistant Varieties Through Marker-assisted Breeding), and (Molecular Fingerprinting of Cacao Parental Recommended HYVs and True Cicoilo Ensuring Multiplication of Quality Planting Materials (OPMs) for Increased Productivity and Profitability), molecular markers were generated, validated and used for fingerprinting of NSIC recommended high yielding varieties enabling identification of molecularly verified and Bureau of Plant Industry (BPI)-certified mother trees and distribution or dispersal of authentic cacao planting stocks to various cacao nurseries. Other promising high yielding and disease resistant cacao accessions have also been identified.  | Publication:<br><br>At least 1 scientific paper<br>At least 2 paper presentations in conferences related to cacao genomics and smart cacao budwood nursery and smart cacao greenhouse<br><br>Leaflets, brochures on true cicoilos in the Philippines, smart cacao budwood nursery and smart cacao greenhouse<br><br>Patent:<br><br>Utility model for molecular identification of true Cicoilo<br><br>At least 2 utility model/ patents for apps<br><br>Product:<br><br>At least 2 software applications   | University of Southern Mindanao (USM)                  | The beneficiaries of the project primarily include cacao breeders, cacao farmers, cacao plantation growers, nursery owners, cacao bean processors, cacao industry, consumers, and government agencies such as the Bureau of Plant Industry and DOST-PCAARRD for the product and technology.  | 01-Jan-23 | 31-Dec-25 | ONGOING                          | 24,176,623         | 4,417,957.60     |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---|---|---|---|---|--|--|-----------|-----------|----------------------------------|--------------------|------------------|
|   | Survey, Propagation, and Conservation of Philippine Native Tausus Species (Tausus wallichiana Zucc.)  | Rapid, inclusive and sustained economic growth                            | Tausus is known worldwide as source of Taxol, an anti-cancer drug. The species native to the Philippines is Tausus wallichiana Zucc., which was reportedly being exploited for the latex extraction. Other potential uses of Tausus are its essential oil with increasing demand abroad. The high costs of essential oil resulted to rampant illegal collection, decreasing population, and inclusion of Tausus in DAO 2017-11 (National List of Threatened Philippine Plants) and CITES (Convention on International Trade in Endangered Species). As of date, there is no existing data on the distribution nor policies specific for Tausus harvesting and collection. Publications on the potential uses, chemical characterization, propagation, and threats are limited despite of its promising uses for medicinal uses and economic value. To address this gaps, resource survey and mapping will be conducted to determine the geographical distribution of T. wallichiana. Meanwhile, different methods and treatments will be tested to develop the Tausus propagation protocol. Several nurseries, capacity building and trainings will be conducted to capacitate the local communities in the protection and conservation of Tausus in their areas.   | 6Ps<br>Year 1<br>Year 2<br><br>Publication<br><br>3 technical articles submitted for publication<br>At least 1 printed IEC material<br><br>Patent   | DOST-Forest Products Research and Development Institute (DOST-FPRDI)   | Department of Environment and Natural Resources Offices (DENR)<br><br>Local Government Units (LGUs)<br><br>Local Communities / People Organizations (PO)<br><br>State University and Colleges (SUCs)<br><br>Research and Development Agencies<br><br>Native tree Enthusiasts | 01-Aug-24 | 31-Jul-26 | ONGOING                          | 4,989,064          | 6,122,600.00     |
|   | Textile Fibers from Philippine Climbing Bamboo Species  | Rapid, inclusive and sustained economic growth                            | In support of the Department of Science and Technology - Niche Centers in the Regions for R&D (DOST-NICER) Program of the Center for Molecular Biotechnology and Bioprocess Engineering Research Program for Capacity Building of Research and Development Institutions and Industrial Competitiveness: Niche Centers in the Regions for R&D Center (NICER) Program, Bamboo R&D Center, the Philippine Textile Research Institute explores the possibility of including the climbing bamboo species to be one of the fiber sources for textile material. This project aims to establish the technical and economic viability of textile fiber from different climbing bamboo species found in the Philippines. The fiber extraction technology will be applied through mechanical extraction, alkali treatment, and yarn processing. The extracted textile fiber for each species will be characterized for its fiber property and processability. Bamboo is a remarkably sustainable and versatile source of raw materials, especially for textile. Bamboo textile is known for its benefits such as being antibacterial, highly absorbent, hypoallergenic, and eco-friendly fabrics. These fabrics are usually subject to a high price in the market due to its intensive production process. Sustainability of raw materials is the priority to cope with the demand for naturally made fabrics. Erect bamboo is the common source of fibers for textile manufacturing, hence, making it more susceptible to the exploitation of raw materials as the demand for bamboo textile increases. Climbing bamboo characteristics are commonly compared to the same climber species which is Rattan (Calamus rotang) that is normally utilized for handicrafts. Climbing bamboo is less known for its market value since erect bamboo are commonly known to people due to its diverse purpose.  | Publications<br>One (1) technical article on the fiber quality of climbing Bamboo species from Northern Mindanao<br>One (1) technical article on the yarn quality of climbing Bamboo species from Northern Mindanao<br>One (1) technical article on the potential of climbing Bamboo species as textile materials<br><br>Patent<br>One (1) IP (Process of producing fibers from climbing bamboo species)<br>One (1) IP (Utility model/Industrial design for yarns rendered using the bamboo blended and natural textile fiber blended yarns)<br><br>Products<br>At least 100kgs of bamboo fibers for each identified four (4) climbing Bamboo species from Northern Mindanao<br>At least 40kgs bamboo blended yarns for each identified four (4) climbing Bamboo species from Northern Mindanao | DOST-Philippine Textile Research Institute (DOST-PTRI)   | Farmers/farming communities<br>Craft makers<br>Handloom weaving communities  | 01-Jan-23 | 31-Dec-24 | ONGOING                          | 10,184,196         | 4,061,960.35     |
|   | Valorization of Bamboo Processing Wastes for Adhesive and Coating Applications (BAMVALOR)   | Rapid, inclusive and sustained economic growth                            | The climbing bamboo are yet to explore and remain untouched for exploration of its market<br>Valorization of bamboo processing wastes through the development of innovative, eco-friendly and economically-promising products, i.e. bio-adhesives and bio-coatings is aligned to the bamboo industry strategic S & T plan. The transformation of the bamboo processing wastes into value-added products will contribute to the optimal utilization of the resource. The frame adhesive material is intended to replace or substitute existing adhesive materials which contains phenols and formaldehyde. Both phenol and formaldehyde are considered environmentally unfriendly chemicals and associated with several health issues by the Environmental Protection Agency (EPA). The European Chemical Agency (ECHA) has also classified both phenol and formaldehyde as mutagenic, carcinogenic, and reproductive chemicals. Formaldehyde is also used in some other resins in addition to the phenolic formaldehyde resin, such as urea formaldehyde (UF) and melamine formaldehyde (MF). The developed bio-adhesives will be used as a binder for plywood manufacture and engineered bamboo. In addition, its binding characteristics will be tested on different adherents including aluminum, polycarbonate plastic and paper. The coating material, on the other hand, is expected to protect wood and bamboo products used for outdoor applications from the harmful effects of UV radiation. This project will work on the new protocols or improvements on existing ones (if available and applicable) to come with products whose properties are at par with commercially-available ones in terms of quality and safety.<br>As mentioned, these innovations are intended to be applied to bamboo products, thereby effectively repurposing the wastes into new products that could also directly benefit the bamboo industry. Bamboo waste valorization may create markets that will bring about benefits in the form of additional opportunities and income for the different players in the bamboo industry and additional total value added to the supply chain. The development and utilization of these products may address the problems associated with the over reliance to fossil-based materials which are not infinite and have so many detrimental effects on the environment. The main objective of this study is also consistent with the achievements of the Sustainable Development Goals (SDGs) particularly goals 1, 8, 12, or No Poverty, Decent Work and Economic Growth, and Responsible Consumption and   | 6Ps<br>Publication<br>Year 1<br>One (1) IEC material, i.e., information bulletin/brochure on utilization of bamboo processing wastes.<br>Year 2<br>One (1) IEC material, i.e., information bulletin/brochure on utilization of bamboo processing wastes (updated).<br>Drafts of two (2) scientific articles for possible publication in peer reviewed journals.<br>Inbros:<br>Year 2<br>Patents<br>Year 1<br>Invention disclosure application for the developed protocols for the production of adhesive and functional coating material from lignin bamboo processing wastes<br>Inbros:<br>Products<br>Year 1  | University of the Philippines Los Baños (UPLB)   | The target beneficiaries of this project are bamboo processing companies, bamboo plantation farmers, related downstream industries, and consumers who are willing to use sustainable and environmental-friendly products from bamboo processing wastes.                      | 01-May-23 | 30-Apr-25 | ONGOING                          | 4,999,371          | 1,799,223.20     |
| Characterization and Performance of Ten (10) Promising Varieties of Cacao in Different Agro Climatic Zones in the Philippines | Proj. 1 Yield and Bean Quality Evaluation of Ten (10) Promising Varieties of Cacao in Different Agro Climatic Zones in Northern and Southern Mindanao | Integrity of the environment and climate change adaptation and mitigation | The cacao tree, Theobroma cacao L., is one of the very popular crop created a rapidly expanding market and a very high price stimulated production and export in all suitable climate. Technological improvements and emergence of new product like chocolate bar in the late 1800s created rapid increase in demand. In the Philippines, cacao production started in 1917 with an average growth rate in production (1977-1986) due to increase in production area i.e. from 4,400 hectares in 1977 to 15,230 hectares in 1986 with estimated production of 2,800 tons in 1977 to 6,240 tons in 1986. Ironically, as the Philippine Cacao Industry was starting to grow, the implementation of the Comprehensive Agrarian Reform in 1988 fragmented the well performing commercial cacao farm.<br>The Philippine government realized the importance of cacao due to its high demand both in domestic and international markets. The current plan of the government and private sector to increase cacao production to 100,000MT in 2022 calls for a lot of planting material (Philippine Cacao Industry Roadmap 2017-2022). This would mean a lot of hectare to be planted from the current ~30,000 has. If we average 1 ton of bean/cocoa, then we need to plant 70,000 has more.<br>Cacao production however, is beset with several problems like pests and diseases, poor cultural practices, and use of low yielding and poor quality planting materials. Several varieties which are of good quality (i.e. criollo) and promising in terms of yield (i.e. W10) are worthwhile to be tested for future use of our cacao farmers. (Definitely, identification of well adapted varieties will benefit growers as the business of trying out varieties will be filled from the farmers' shoulders and definitely justifies the resources invested in it. The output will be varieties identified to do well in a particular agro-climatic zone and can easily be disseminated by informing accredited nursery centers priority varieties to be propagated in each region and by providing them the mother plants as soon source. The output of this research will benefit the DA for its cacao expansion program, DAR ARBs and NDR of DENR.<br>To-date, cacao production is one of the measurable areas under ISP of PCAARRD through identification of superior varieties in terms of yield and its tolerance to pests and dis-eases adapted to specific locations. Moreover, production of good bean characteristics and their availability to local cacao growers appear to be the best short term strategy to genetically improve cacao and ensure increased local productivity. Newly introduced clones from the International Cocoa Quarantine Center based at the University of Reading, UK and open local varieties represent potential source of desirable traits. Assessment of performance of promising hybrids generated from local and introduced varieties in local conditions is a valuable step to determine their suitability for future genetic manipulation. Moreover, this research undertaking may lead to the identification of superior varieties of cacao for general and specific recommendation. | Selected 1 or 2 cacao varieties with outstanding performance adaptable to high, medium and low elevation.<br>2. Identified varieties for combined elevation and climatic type- with resistance to pest and diseases and high productivity level.<br>3. Production of IEC materials.<br>3. Partial budget analysis for multination cacao trials<br>3. Capacity building and dissemination of new technologies to farmers   | University of Southern Mindanao (USM), Sultan Kudarat State University (SKSU), Agusan del Sur State College of Agriculture and Technology (ASSCAT) | The beneficiaries of the project primarily include nursery owners, cacao farmers, cacao planters/growers, cacao bean processors, cacao breeders, cacao industry, consumers and government agencies such as Bureau of Plant Industry  | 16-May-23 | 15-May-25 | ONGOING                          | 2,760,000          | 535,921.74       |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---|--|---|---|--|--|--|-----------|-----------|----------------------------------|--------------------|------------------|
| Characterization and Performance of Ten (10) Promising Varieties of Cacao in Different Agro Climatic Zones in the Philippines   | Proj. 2 Yield and Bean Quality Evaluation of Ten (10) Promising Cacao Varieties in Type I and Type IV Agro Climatic Zones in Southeastern Mindanao, Visayas and Northern Luzon | Rapid, inclusive and sustained economic growth                            | <p>The cocoa tree, <i>Theobroma cacao</i> L. is one of the very popular crop created a rapidly expanding market with a very high price stimulated production and export in all suitable islands. Technological improvements and emergence of new product like chocolate bar in the late 1800s created rapid increase and demand. In the Philippines, cacao flourished into an industry with 9% average growth rate in production (1977-1986) due to increase in production area (from 4,400 hectares in 1977 to 15,230 hectares in 1986) with estimated production of 2,900 tons in 1977 to 6,240 tons in 1986. Ironically, as the Philippine Cacao Industry was starting to grow, the implementation of the Comprehensive Agrarian Reform in 1988 fragmented the well performing commercial cacao farm.</p> <p>The Philippine government realized the importance of cacao due to its high demand both in domestic and international markets. The current plan of the government and private sector to increase cacao production to 100,000MT in 2022 calls for a lot of planting materials (Philippine Cacao Industry Roadmap 2017-2022). This would mean a lot of hectares to be planted from the current ~30,000 has. If we average 1 ton of beans/ha, then we need to plant 70,000 has more.</p> <p>Cacao production however, is beset with several problems like pests and diseases, poor cultural practices, and use of low yielding and poor quality planting materials. Several varieties which are of good quality (i.e. crisis) and promising in terms of yield (i.e. W10) are worthy to be tested for future use of our cacao farmers. Definitely, identification of well adapted varieties will benefit growers as the burden of trying out varieties will be lifted from the farmers' shoulders and definitely justifies the resources invested in it. The output will be varieties identified to do well in a particular climatic zone and can easily be disseminated by informing accredited nursery owners priority varieties to be propagated in each region and by providing them the mother plants as soon source. The output of this research will benefit the DA for its cacao expansion program, DAR ARBs and NGP of DENR.</p> <p>To date, cacao production is one of the researchable areas under ISP of PCAARRD through identification of superior varieties in terms of yield and its tolerance to pests and 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 increased local productivity. Newly introduced clones from the International Cocoa Quarantine Center based at the University of Reading, UK and open local varieties represent potential source of desirable traits. Assessment of performance of promising hybrids generated from local and introduced varieties in local conditions is a valuable step to determine their suitability for future genetic manipulation. Moreover, this research undertaking may lead to the identification of superior varieties of cacao for general and specific recommendation.</p> | <ol style="list-style-type: none"> <li>1. Selected 1 or 2 cacao varieties with outstanding performance adaptable to high, medium and low elevation.</li> <li>2. Identified varieties for combined elevation and climatic type, with resistance to pest and diseases and high productivity level.</li> <li>3. Production of IEC materials.</li> <li>4. Partial budget analysis for multilocation cacao trials</li> <li>5. Capacity building and dissemination of new technologies to farmers</li> </ol>   | DA Region 11, Visayas State University (VSU), Benguet State University (BSU) | The beneficiaries of the project primarily include nursery owners, cacao farmers, cacao plantation growers, cacao bean processors, cacao breeders, cacao industry consumers and government agencies such as Bureau of Plant Industry   | 16-May-23 | 15-May-25 | ONGOING                          | 2,240,000          | 294,438.00       |
| Managing Cocoa Quality in the Post-Harvest Process: Biological Approaches for the Management of Mycotoxins and Storage Pests of Cacao                                 | Proj. 2 Management of Storage Insect Pests and Mycotoxins of Cocoa Using Biological Control Approaches   | Integrity of the environment and climate change adaptation and mitigation | <p>After harvest, the cocoa bean is fermented, dried, and stored. Farmers remain vulnerable to production losses during these processes and the quality and flavor of the product is defined by the environment and the methods used. Post-harvest processing falls upon the pillars of productivity and adaptation. Farmer incomes are dependent on the amount of cocoa beans they can sell and the success in post-harvest processing is dependent on the interaction between environmental factors (e.g. humidity and factors related to the process (e.g. bacteria during fermentation)). The last step in cocoa processing is storage of dried beans. During storage, beans are risk of damage in particular the presences of insect storage pests such as warehouse moths and red flour beetles.</p> <p>These insect pests of stored products have for long greatly depended on the use of synthetic insecticides and fumigants, which have multiples of problems such as residues in products, and insecticide resistance. Thus, a big concern on food safety. Warranting the need to explore alternative methods, which are bio-based. Losses from insect infestation in the postharvest facility is ranging from 5-30% and can reach 100% if left unattended especially when the beans become unfit for human and animal consumption due to increase Free Fatty Acid (FFA) content brought about by the after effect of the storage insect pests.</p> <p>This project under the cacao post-harvest program will develop a bio-based management system with innovative tools in controlling the population of storage insect pests on cocoa beans. Innovative tools include monitoring and control of insect pests through semiochemicals, the use of biological control agents), and particle film technology with entomopathogens as repellent and biocontrol. This storage pest management system will serve as early detection and quick response to mitigate the effect of storage insect pests as well as tools resulting in superior quality of cocoa beans for local consumption and will increase competitiveness of the country in the international market.</p>  | <ol style="list-style-type: none"> <li>1) Publications (no. of paper published/peer reviewed and IEC materials, citations) Year 1 1 publication Year 2 3 publications Manuals, Guide, IEC materials for on-site detection (at least 3)</li> <li>2) Patents (no. of patents, IP filing) Patent application on the pest management tools</li> <li>3) Products (perceived future value of commercialized products) Kairomone/pheromone trapping system Biocontrol agent</li> <li>4) People and Services (no. of MS, PhD Graduated, no. of trained personnel, value of public service contributed) Year 1 At least 2 graduate students (MS/PhD in Biology, and Computer Science) Year 2 Farmers (at least 25 for each location); Agricultural technicians (at least 2 for each partner agencies)</li> <li>5) Places and Partnership (if of status formed, MOA/MOU signed) concerned agencies like LGUs, DA, and academic institutions and potential industry partner Michigan State University</li> <li>6) Policies Policy brief governing innovative postharvest operations towards production of superior quality cocoa beans</li> <li>7) Social 2Is (Impacts)</li> </ol>  | De La Salle University (DLSU)  | <p>Postharvest Facilities<br/>Other Partners/Adaptors<br/>Bureau of Plant Industries (Pest Clinic Laboratories)</p> <p>Municipal Agricultural Offices<br/>Farmers as identified by DA Regional Offices</p>   | 01-Jul-22 | 30-Jun-25 | ONGOING                          | 6,742,532          | 1,179,070.60     |
| Mt. Banahaw Biodiversity Assessment, Valuation and Conservation   | Proj. 2 Reproductive Phenology, Propagation, and Habitat Characterization of Threatened and Economically Valuable Flora in Mt. Banahaw de Lucban                               | Rapid, inclusive and sustained economic growth                            | <p>This is a solicited from SLU to support the on-going PCAARRD-funded project titled "Inventory and Assessment of Flora and Fauna, and Macrofungi in Mt. Banahaw de Lucban" under the program "Mt. Banahaw Biodiversity Assessment, Valuation and Conservation". It specifically addresses the conservation of threatened and economically valuable flora in Mt. Banahaw de Lucban (MBL).</p>  | <ol style="list-style-type: none"> <li>1) Journal Article/Book/Institutional materials/Patents/Application for patent on the distribution and habitat suitability maps of the threatened and economically valuable plants in MBL/Products/GIS generated maps of the threatened and economically valuable plants in MBL/Developed protocol on species propagation (sexual and asexual) of the threatened and economically valuable plants in MBL/Developed calendar of Phenology and pollination of species of the threatened and economically valuable plants in MBL/People Services/At least one (1) graduate student and one (1) undergraduate student involved/trained in the observation of phenology, propagation, and GIS mapping of the threatened and economically valuable plants in MBL/Places and Partnership/At least one (1) partnerships forged through MOA/MOU with LGU, POs and/or DENR/policies/Draft policy recommendations on: (1) improvement of the management strategies for MBL towards the conservation of its biodiversity; and (2) conservation and propagation of the threatened and economically valuable plants in MBL/2Is/Economic Impact/Improved propagation protocol can benefit nursery operators. Propagation techniques can be adopted to improved production of high quality planting materials/Social Impact/Results of the project can contribute in improving policies for appropriate management of Mt. Banahaw including the rehabilitation of degraded areas in the locality</li> </ol> | Southern Luzon State University (SLSU)                                       | The immediate beneficiaries of the project are students, faculty researchers, nursery personnel, tree farmers, community residents, decision-makers, Government Institutions engaged in Environmental conservation (DENR, PAIR, LGUE™s), Non-Government Institutions (NGO, POE™s), SLSU other academic institutions (SUCs); Researchers; reforestation programs or tree plantations, stakeholders of MISCPL and vitines. It could also be beneficial as a livelihood option for the community. | 01-Jan-23 | 30-Jun-25 | ONGOING                          | 4,999,650          | 2,359,325.20     |
| A Valorisation of Agri-Fishery Materials Using Opportune Science (AVAMOS): Nanomaterials from mussel shells for agri-aquaculture applications                         | Proj. 2 Valorisation of Agri-Fishery Materials Using Opportune Science (AVAMOS): Nanomaterials from mussel shells for agri-aquaculture applications                            | Integrity of the environment and climate change adaptation and mitigation | <p>AVAMOS, which stands for A Valorisation of Agri-Fisheries Materials using Opportune Science, is a registered trademark of UP Visayas researchers whose goal is to transform low value and/or waste materials into high value bio-based materials. It abides by the principles of green chemistry and circular economy in implementing such transformations, and will showcase the application of these principles on mussel shells. For this project, AVAMOS considers key aspects in valorisation strategies such as proximity of mussel shell waste generators to the valorisation facility and proximity to where the resulting products have a market. UPV developed technologies for the processing of mussel meat. Other companies are also producing fish paste out of mussels. These activities can potentially generate tons of shells as byproducts which can be processed by AVAMOS into products for potential use in agriculture and aquaculture farms in the region. Thus, the specific tasks in this project include the use mussel shells as nanomaterials for the removal and/or recovery of excess nitrogen and phosphorus from aquaculture effluents and synthesize nano-hydroxyapatite from mussel shells for agriculture or aquaculture use.</p> <p>The outlined tasks hope to demonstrate the strength of interdisciplinary work to ensure that innovation anchored on green nanotechnology processes and circular economy is translated into positive impact to society.</p>  | <ol style="list-style-type: none"> <li>1 scientific paper on the product development.</li> <li>1 abstract in conferences</li> <li>1 conference posters</li> <li>1 scientific paper on life cycle assessment of developed product.</li> <li>1 abstract in conferences</li> <li>1 conference posters</li> <li>2 technical manuals/guides</li> <li>2 technical specifications</li> <li>2 training modules</li> </ol> <p>Patent/ Intellectual Property<br/>2 UM applications (process of producing nano-hydroxyapatite and process of preparing calcium hydroxide)<br/>2 trademarks applied</p> <p>Product<br/>1 bioliter matrix powder<br/>1 process of synthesizing calcium hydroxide nanoparticles<br/>1 slow-release fertilizer powder<br/>1 process of producing nano-hydroxyapatite<br/>1 website</p> <p>People and Services<br/>1 BS or MS Students involved<br/>5 researchers trained<br/>2 invention disclosure report<br/>2 prior art search report</p> <p>Place and Partnership<br/>1 Collaborative Research Agreement with an aquaculture farm operator</p> <p>Policy<br/>1 policy recommendation input on the integrated use of mussel waste products to support the creation of livelihood</p>   | University of the Philippines Visayas (UPV)                                  | Mussel Producers, Mussel Processors, aquaculture farm operators, Nanofertilizer developers and consumers, Academia   | 01-Jan-23 | 31-Mar-25 | ONGOING                          | 4,837,122          | 2,083,179.60     |
| An investigation of biological and exogenous cues towards the upgrading of harvest efficiency and spatial prediction of green mussel <i>Perna perna</i> (CUES-Mussel) | Proj. 2 Investigation of biological and exogenous cues towards the upgrading of harvest efficiency and spatial prediction of green mussel <i>Perna perna</i> (CUES-Mussel)     | Poverty reduction and empowerment of the poor and vulnerable              | <p>To enhance the production of mussel culture through the identification of factors influencing the meat quality and spatial leading to the identification of ideal harvest period and spatial patterns.</p>   | <ol style="list-style-type: none"> <li>1) 1 scientific article drafted for submission to ISI/ISI-indexed journal</li> <li>2) technical papers presented in scientific conferences.</li> </ol> <p>Patents<br/>1 IEC material submitted for copyright.</p> <p>People and Services<br/>3 BS Students, 1 MS Student, 5 partners trained in data collection and analysis, 2 faculty mentees</p> <p>Places and Partnerships<br/>4 MOU/MOA with BIFAR X, VI, LGU of Camiguin and Sapi-an Capiz, 2 Higher educational institution</p> <p>Policy Recommendation<br/>Policy recommendation on mussel harvest and culture</p>   | Mindanao State University Naawan (MSU-Naawan)                                | Men and women mussel producers, Men and women Processors, LGUs, communities, fisherfolk, people™s organization, students, researchers, national line agencies, academe, private sectors  | 01-Oct-24 | 30-Sep-26 | ONGOING                          | 4,999,702          | 1,841,826.00     |

| 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, 2024 | Total Project Cost | 2024 PCAARRD GIA |
|---------------|---|---|--|--|--|--|-----------|-----------|---------------------------------|--------------------|------------------|
|               | Antimicrobial resistance (AMR) in tilapia production environments and associated important piscine bacterial pathogens in the Philippines | Poverty reduction and empowerment of the poor and vulnerable              | The dramatic growth in aquaculture production due to an ever-increasing human population has led to the rise of numerous challenges. One of these is the occurrence of disease outbreaks caused by virulent bacterial pathogens. To address this problem, one of the most widely used prophylactic and therapeutic methods is the use of antibiotics. However, the overuse and misuse of antibiotics has led to a high level of antimicrobial resistance (AMR) in aquaculture. Moreover, the drugs used to control bacterial infections in fish farms are usually the same as those used in humans and animals. Antibiotics which can threaten global health and food security. The occurrence of AMR in South East Asian aquaculture has not been completely yet and available information is still scarce. In the Philippines, few studies have been done on AMR, and a comprehensive research work on AMR in tilapia farming is non-existent at the moment. Detection of drug-resistant phenotypes and genotypes can be used to monitor and correlate bacterial infections and epidemics in different tilapia farms. Understanding disease causality outbreaks in tilapia aquaculture production through the lens of AMR research will help contain the spread of AMR via the aquaculture value chain and minimize their associated human health risks.   | Publication: One (1) Scientific Poster/ Oral Presentation/One (1) Draft Scientific Journal Publication/Two (2) Draft Scientific Journal Publications/One (1) Protocol Manual on Rapid Detection of presence of Antibiotic Residues in Tilapia/One (1) Protocol Manual for Metagenomic Analysis for Rapid Detection of Antibiotic Resistance Genes (ARGs) in Tilapia/One (1) Utility model on Rapid Detection of presence of Antibiotic Residues in Tilapia/One (1) Protocol on Rapid Detection of presence of Antibiotic Residues in Tilapia/One (1) Protocol for Metagenomic Analysis for Rapid Detection of Antibiotic Resistance Genes (ARGs) in Tilapia/One (1) Draft Scientific Journal Publications (1 PhD, 1 MSc), and 2 Undergraduate Students supported/At least 2 Research Staff trained/Place One (1) MOA with National Fisheries Research and Development Institute (NFRDI) / Fisheries Biotechnology Center (FBC) and Brachyotter Fisheries Research and Development Center (BFRC)/One (1) MOU with University of Stirling/Policy One (1) Draft policy recommendation on the proper use of antibiotics, and detection of antibiotic resistance in fish production especially in tilapia aquaculture in the Philippines  | Iloilo Science and Technology University (ISAT-U)                | Aquaculture industry<br>Fish consumers<br>Male and Female Researchers<br>Academe<br>Health sector  | 01-Oct-24 | 30-Sep-27 | ONGOING                         | 8,995,676          | 4,131,820.00     |
|               | Assessment of Invasive Exotic Fish in Laguna de Bay   | Rapid, inclusive and sustained economic growth                            | The project will come up with an Atlas of invasive species in Laguna de Bay that includes reference information on the spatio-temporal distribution, prey preference, and reproductive biology of exotic fish in Laguna de Bay. This can be done by regularly collecting enough specimens of present exotic fish at different sampling sites to get a picture of their population size and distribution across time and space; feeding ecology which will be established through routine analysis of their gut contents; reproductive biology of each present invasive exotic fish then will be assessed through monthly gonadal examination of both sexes; and the information on the diversity, abundance and potential negative impacts of these exotic fish will be established.   | Publication: 2 draft ISI journal article submitted for publication<br>1 IEC material (poster/Patent/ N/A/Product: Map of species distribution/People: 2 Undergraduate Thesis/Student Training/Workshop of Researchers/Place: 1 potential MOA/MOU with LIDA and BFAR/Policy: Policy recommendation for management of alien invasive fish  | University of the Philippines Los Baños (UPLB)                   | Primary beneficiary of this project will be the fisherfolks relying on fish catch from Laguna de Bay for their source of income. Conservation efforts for endemic fish species of Laguna de Bay will benefit from more information on the potential threats posed by the presence of alien invasive aquatic species.   | 01-Aug-24 | 31-Jul-26 | ONGOING                         | 5,000,000          | 3,112,074.70     |
|               | Bangus Expositoms: Integrated Profiling and Health Monitoring of Milkfish in the Philippines  | Rapid, inclusive and sustained economic growth                            | Aquaculture has been rapidly increasing in recent years and is one of the fastest-growing food sectors, serving as a valuable element for national and community development in many areas worldwide. Significant advances have been made in microbiology and molecular biology to allow for better management of pathogen risks in natural environments, including aquaculture production. In the Philippines, several efforts have been undertaken to determine and identify milkfish microbial pathogens, though most identification methods remain culture-dependent. To date, most studies on milkfish pathogens in the Philippines have relied on culture-dependent methods in the detection and identification of these pathogens. This can lead to an underestimation of less-studied and non-culturable pathogens. Furthermore, the interplay of different factors including environmental exposures affecting bangus health and productivity has not been fully studied. The main gap addressed by this project is the lack of characterization of the exposure of bangus as it relates to bangus health and productivity which can be done through early detection of pathogens, unraveling microbiomes, analyzing fish health and monitoring water quality, impacting milkfish aquaculture in the Philippines.<br><br>This project aims to investigate the microbiomes, emerging pathogens, water-environment quality, histopathology, and potential N-glycan biomarkers related to the overall health of bangus. By focusing on these, the project seeks to fill the identified gap by providing a clearer understanding of the bangus exposure, that is, relationships between microbial communities, pathogens, environment, and possible health biomarkers impacting the biology of bangus. The data gathered will enhance knowledge of bangus health and productivity, ultimately contributing to more effective disease management, sustainable aquaculture practices and a boost in bangus productivity.  | 6Ps<br><br>Year 1<br><br>Year 2<br><br><br>Publication<br><br>One (1) ISI Scopus Publications<br><br>Two (2) ISI Scopus Publications<br><br><br>Products<br><br>None<br><br>One (1) Scorecard guide for health assessment of milkfish  | University of the Philippines Los Baños (UPLB)                   | This project will benefit the consumers, businesses and milkfish farmers by providing an avenue for the development of new targets for the early detection of unknown and less studied pathogens in milkfish. Early detection of possible new emerging pathogens would put the Philippines one step ahead in case an outbreak will happen in the future.   | 01-Dec-24 | 30-Nov-26 | ONGOING                         | 23,716,100         | 9,129,296.90     |
|               | Broodstock Development of the Mangrove Crab <i>Scylla olivacea</i>  | Rapid, inclusive and sustained economic growth                            | <i>Scylla olivacea</i> (Herbst, 1796) is one of the four mangrove crab species (Keenan et al., 1998) and the most widely distributed and dominant mangrove crab species in the West Philippine Sea and between islands of the archipelago (The Mangrove Crab Technical Committee 2018; Walton et al., 2006). Being relatively smaller compared to other mangrove crab species, <i>S. olivacea</i> are less exploited in aquaculture production (Castro-Gonzalez et al., 2018) but has also become a major cultured crab in countries with a significant estuarine mangrove area such as the Bangladesh. The importance of this species as an aquaculture commodity is associated with its high tolerance to the wide fluctuation of environmental parameters of estuarine area (Lubana et al., 2009) and resilient to many viral diseases that affects other crab and shrimp species making them ideal for restocking in mangroves, estuarine and other areas with highly fluctuating or low salinity environment. Protocols for breeding and seed production of mangrove crab has been published (Shelley and Lovell 2011; Quinto et al. 2008; Fortes et al., 2002) but this was mainly developed and established for other species. As a particular species distinct from other mangrove crabs, there must be unique and specific requirements for their rearing and management to ensure good survival, development, growth and reproduction. These works however would be a very valuable basis for the development of breeding and seed production technology very much suited for <i>Scylla olivacea</i> . The Philippine population of <i>S. olivacea</i> is composed of several genetic clusters (Paran and Ranao-Gutano 2017). These stocks being adapted to the dynamics of their local environment had acquired different levels of growth and reproductive potential, and tolerance to disease and environmental challenges. The findings of the study will serve as basis for the selection of areas for <i>S. olivacea</i> collection to be evaluated for their suitability as breeders for aquaculture production. The present study is an initial step toward enhancement of their aquaculture potential through selective breeding and domestication. This approach would ensure supply of high health broodstock for the hatchery facility and for other larval rearing facilities to be established in other parts of the country in the future. The project envisions to establish sufficient supply of crab seeds to encourage <i>Scylla olivacea</i> aquaculture in more areas and as a strategy to mitigate the impact of climate | Publication: 3Patent: 2Product: 2People: 3Place: 3   | University of the Philippines Visayas (UPV)                      | 1. Brackish water pond operators and workers<br>2. Hatchery operators and personnel<br>3. Men, women and children in coastal communities<br>4. People in academe (Faculty, Researchers, and students)<br>5. Local Government Units   | 01-Mar-25 | 28-Feb-27 | ONGOING                         | 5,000,000          | 2,791,312.00     |
|               | Chemical Residue Profiling of Milkfish using XRF Technology   | Rapid, inclusive and sustained economic growth                            | Research interest in mercury poisoning and other heavy metal contamination has recently risen due to their potential health implications. Heavy metal poisoning is chronic in nature, such that constant exposure over long periods of time results in accumulation which leads to a multitude of different medical conditions. Such medical conditions may at times be fatal. Due to the greater than average amount of heavy metals present in the environment of certain localities in the Philippines, there is a need to survey the heavy metal content in common food sources, specifically fishes.<br><br>X-ray fluorescence (XRF) spectrometry has become one of the most effective methods for determining the elemental composition of samples because of its non-destructive, fast, and continuous measurements. This study aims to use a benchtop x-ray fluorescence (BXRf) analyzer to screen Philippine milkfish ( <i>Chanos chanos</i> ) for mercury (Hg), arsenic (As) content, and other toxic heavy metals. In effect, this would lead to generation of a heavy metal profile of Philippine milkfish obtained from various regions in the country. In addition, the study contributes to the method development, optimization, and validation of detecting heavy metals in milkfish using the handheld x-ray fluorescence (HXRF) available in ADMATEL Chemical and Metallurgical Laboratory, thus enhancing the capability of ADMATEL for heavy metals analysis. Efficiency between the BXRf and HXRF in heavy metal content determination in terms of the limit of detection, precision, and accuracy will also be compared in this research study.   | Publication: One (1) publication or presentation in peer-reviewed scientific conference and/or conference proceeding/Patent/N/A/Product: Evaluated method on application of HXRF for Heavy Metal screening for Milkfish<br>Validate method on application of XRF for Heavy Metal screening for Milkfish/People: At least Two (2) staff trained on XRF/Place: Partnership with local aquaculture/Policy/Advocate safer milkfish sourcing based on the results of the study.   | DOST-Industrial Technology Development Institute (DOST-ITDI)     | Target beneficiaries include policy makers, small-scale aquaculture sector, local barangays, and everyday Filipino fish consumers.   | 01-Jan-23 | 31-Dec-24 | ONGOING                         | 4,999,239          | 2,029,674.32     |
|               | Development of Baculovirus Expression Vector System (BEVS)-based subunit protein vaccine against Tilapia Lake Virus                       | Integrity of the environment and climate change adaptation and mitigation | Tilapia Lake Virus (TLV) has been reported to infect wild tilapia <i>Sarotherodon galilaeus</i> , farmed tilapia <i>Oreochromis niloticus</i> and commercial hybrid tilapia ( <i>O. niloticus</i> X <i>O. aureus</i> ) (Bacharach et al., 2016; Engor et al., 2014; Fasgun et al., 2016) and cowbirds have also detected TLV in wild river carp ( <i>Barramundi schwanenfeldii</i> ) in Malaysia (Abdullah et al., 2018). Zebrafish ( <i>Danio rerio</i> ) was also found to be susceptible to TLV infection and a good animal model to study fish-pathogen virus (Raines et al., 2020). To date, one mentioned species of fish found to be susceptible to TLV infection but it is possible that other species will be found to be susceptible when epidemiologic studies on its susceptible hosts would be intensified. The emergence of TLV is the first ever reported infectious disease in epidemic proportion in tilapia aquaculture which threatens the global tilapia industry. The risk is further exacerbated by irresponsible trade in live marine and fresh water animals and disregard to biosecurity. The very high mortality (20-90%) of tilapia raised by TLV infection may also affect food security and nutrition since tilapia serves as a cheap protein source especially in the developing parts of the world. The threat of TLV to global tilapia industry and to ecology, economy, food security, and nutrition is alarming. Immediate action to control, prevent, and mitigate this aquaculture disaster to farmed tilapia caused by TLV is warranted through the development of prophylactic vaccine, diagnostics, and antivirals.   | Publication: 1 ISI-indexed publication/Patent: 1 Oral subunit protein fish vaccine against TLV/Product: 1 Potential vaccine candidates against TLV<br>1 Oral subunit protein fish vaccine against TLV/People: 5 Training of project staff, students (MS, PhD), and other beneficiaries to be proficient to perform recombinant protein production<br>3 Training of project staff, students (MS, PhD) and other beneficiaries to be proficient on performing vaccine challenges and vaccine administration/Place: 1 Coordination and consultation meeting with Cooperating agencies (Chung Yuan Christian University/Policy: It is expected that through this project, both National Fisheries Research and Development Institute, Department of Agriculture, Philippines and Chung Yuan Christian University, Taiwan, will come up with policy to share more resources, expertise, and best practices in aquaculture/aquaculture biotechnology. This project may also be a basis for the institutionalization and establishment of Vaccine Research Institute in the Philippines and expand vaccine development cooperation with Taiwan not only for fisheries/aquaculture and animal use but also for human use to prevent human and animal disease to explode into another pandemic. | National Fisheries Research and Development Institute (DA-NFRDI) | Local fisherfolks, tilapia farm owners, tilapia industry<br>Fish Health management sector (BFAR Fish Health Management and Quality Assurance Laboratory, BFAR Regional Offices/Regional Fish Health Laboratories)<br>Local Government Units, NGOs, private stakeholders<br>Researchers, academics, and extension workers.<br>Individuals in the field of serology, aquatic pathology, fish production, molecular diagnostics, etc. | 01-Oct-22 | 31-Mar-25 | ONGOING                         | 10,471,330         | 988,492.31       |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---------------|--|--|---|--|--|--|-----------|-----------|----------------------------------|--------------------|------------------|
|               | Development of locally-available essential oil as a growth-promoting and anti-microbial feed additive for saline tolerant tilapia <i>Oreochromis niloticus</i>                           | Poverty reduction and empowerment of the poor and vulnerable | As a vital support to the economic development of the country, the needs of the Tilapia farming industry should be continuously addressed to secure its profitability and sustainability. One of the ways to improve tilapia aquaculture production is to improve the quality of feeds. Addition of small doses of antibiotics in the fish feed has been practiced promoting growth and prevent infectious disease outbreak in fish culture. However, the negative impact of antibiotic use animal culture industry such as the persistence of antibiotic-resistant bacteria and accumulation of residues in the environment and fish flesh which could harm the consumers, has resulted in the search for more sustainable and environment friendly materials as feed additive. Additional natural products from plants such as essential oils have gained great interest as these compounds have been established to have low toxicity, beneficial bioactive components and are economically viable. Essential oils extracted from indigenous plant species such as ginger, garlic, lemon grass and bamboo leaves are now available in the market and can be utilized in variety of ways. The proposed study will attempt to explore the potential of these locally available essential oils as growth promoter and antibacterial agent in tilapia aquaculture. The outcome of this proposed project will provide in developing efficient management strategies for disease control and growth promotion, which will subsequently contribute to achieving sustainability in tilapia aquaculture.                  | Publication: 2 Scientific paper publications; Patent: 1 patent application; Product: 1 Product related to essential oil-based feed additive; People: support 2 undergraduate and 2 MS students; Place: 1 industry and 2 academic partner.<br>Industry Partner: Iloilo City Aquaculture Association<br>Academic Partner: A: University of Antique Taro Lim Memorial Campus, Poblacion, Tibao, Antique<br>C: Capa State University-Sayayon Satellite College, Fisheries Department/Rosita City, Capa<br>Policy: Policy related to the regulation of indiscriminate use of antibiotics as antimicrobial growth promoters in tilapia aquaculture through environment-friendly alternatives.  | University of the Philippines Visayas (UPV)                  | Accredited Tilapia breeders<br>Accredited Tilapia growers<br>Feed Companies<br>Scientific community  | 01-Mar-23 | 28-Feb-25 | ONGOING                          | 4,983,933          | 2,286,516.19     |
|               | Development of Natural Hatcheries for Green Mussel, <i>Perna perna</i> , in Tagabuli Bay, Davao del Sur: A Model for Sustainable Production of Green Mussel                              | Poverty reduction and empowerment of the poor and vulnerable | Green mussels are an excellent source of cheap but high-quality protein and unsaturated fatty acids. They are also very suitable for aquaculture due to their ability to easily adapt to different cultivation methods and fluctuating environmental conditions. The growth of this industry is however, hindered by challenges posed by inadequate supply of quality seedstock. This problem was further exacerbated by the dismantling of over 200 mussel farms in 2022 to make way for the Navotas Coastal Bay Reclamation Project. These traditional culture sites account for a considerable bulk of green mussel production both for consumption as well as broodstock source. There is therefore, a pressing need to identify new sites for green mussel production and enhance the natural seedbed in those areas. Mindanao is a potential area for the expansion of green mussel culture due to its weather, location (less prone to typhoons) and many sheltered coves and bays that are ideal production sites. By happenstance, the LGU of Sta. Cruz, Davao del Sur sought the help of MSU Naawan for the development of green mussel culture to provide an alternative livelihood opportunity to coastal communities heavily reliant on the bangus industry which is facing decline of production due to the proliferation of unregulated fish cages and environmental degradation.  | 6Ps<br>Year 1<br>Year 2<br>City<br>Publications<br>2 paper presentation<br>2 draft journal articles for submission<br>2 paper presentation<br>At least one (1) IEC material (brochure/ pamphlet) on the results of the project.  | Mindanao State University Naawan (MSU-Naawan)                | Bureau of Fisheries and Aquatic Resources (BFAR)-Region XI and Provincial Fisheries Office - Digos City Davao del Sur (Assist in the survey and site selection and implementation)<br>Municipal Agriculturist Office, Municipality of Sta Cruz, Davao del Sur (Assist in the survey and site selection, assist in the acquisition of required documents and implementation)              | 01-Oct-24 | 30-Sep-26 | ONGOING                          | 4,999,304          | 1,702,107.00     |
|               | Enhancing the natural population of green mussel in Taguines Lagoon, Camiguin: A strategy for sustainable seedstock production for expansion of the mussel industry in Northern Mindanao | Poverty reduction and empowerment of the poor and vulnerable | The green mussel production in the country is declining, highlighting the urgent need to identify additional areas for mussel culture and explore potential sources of healthy and clean seedstocks for expansion. One such promising area sourcing seedstocks for the expansion of mussel culture in Northern Mindanao is Taguines Lagoon in Camiguin. The lagoon has a naturally occurring mussel population and serves as the primary source of green mussels in Region X. Recent surveys have revealed the absence of plankton known to cause Harmful Algal Blooms (HABs), making Taguines Lagoon an ideal seedbed area. However, the current farming practices in Taguines Lagoon require modification and improvement to enhance production. The Lagoon Seashells Production Association, a cooperative that produces green mussels, has requested technical assistance from MSU at Naawan to enhance their spat collection and grow-out technology. Therefore, this project aims to provide technical assistance to the association, addressing their challenges by introducing efficient spat collection technology and improving grow-out culture methods. Additionally, the project aims to identify potential expansion sites in the region through a preliminary in-situ culture, enhancing mussel production in Northern Mindanao. Furthermore, the project will assess social factors that influence the acceptability of new technology within the community. This ensures that the technology aligns with the preferences and needs of the local community, thereby ensuring its long-term success. | 6Ps<br>Year 1<br>Year 2<br>City<br>Publications<br>1 draft journal publication<br>1 paper presentation   | Mindanao State University Naawan (MSU-Naawan)                | Lagons Seashells Production (Mussel Farmer's Association) € primary collaborators in Camiguin<br>LGU of Camiguin € collaborator in the trial sites and primary adopter of the project<br>LGU (e.g. Marcolagos, and Lanao) € collaborators in the trial sites   | 01-Oct-24 | 30-Sep-26 | ONGOING                          | 4,999,928          | 1,701,732.00     |
|               | Enhancing the Quality of Measurement of Local Testing Laboratories in the Philippines for the Analysis of Toxic Elements in Mussels through Proficiency Testing Scheme                   | Poverty reduction and empowerment of the poor and vulnerable | In this project, the performance of local testing laboratories in determination of toxic elements in mussels will be assessed through proficiency testing scheme in accordance with the requirements of ISO 17043. Proficiency test items will be produced from mussel matrix in accordance to ISO Guide 35 standard. The assigned value of the proficiency test item will be determined using high order method and gravimetric sample preparation.  | 6Ps<br>Year 1<br>Year 2<br>Publication<br>One (1) paper submitted to scientific forum<br>Product<br>Three (3) validated methods: GF-AAS for Pb and Cd, HVG-AAS for As, and DMA for Hg in mussels   | DOST-Industrial Technology Development Institute (DOST-ITDI) | Local testing laboratories are the primary beneficiaries of this project as support will be given through local PT provision. These include DOST regional laboratories, Bureau of Fisheries and Aquatic Resources (BFAR), National Food Authority-Food Development Center, private testing laboratories and other ONELAB members which are capable of testing toxic elements in mussels. | 01-Jan-23 | 31-Dec-24 | ONGOING                          | 4,999,987          | 1,981,754.58     |
|               | Establishment of Biological Water Quality Index Based on Diatoms for Fishery Production and Environmental Conservation in Batangas and Marikina Rivers, Philippines                      | Rapid, inclusive and sustained economic growth               | The Philippines has a vast surface of freshwater resources. They provide a large percentage of its population. However, the freshwater productivity of freshwater bodies in some parts of the country has declined in recent years as a result of deteriorating water quality and degradation of freshwater ecosystems. To date, there are no existing guidelines and integrative indices to measure river health tailored for the Philippines and there are also gaps in performing river assessment in the country (Mattice, 2018). The establishment of Water Quality Management Areas (WQMA) by DENR-EMB includes consideration of water quality problems, potential sources of water pollution and measures to achieve improvement of water quality. However, there are means of quickly assessing water quality of rivers to present their deterioration. Hence, the need to develop an index of water quality using diatoms tailored for the Philippine condition.   | Publication: Checklist of Diatoms of Marikina River and Batangas Rivers (Pansipit and Palanas) Patent: N/A Product: Deposition of type diatom specimens and material references on Diatoms in the herbarium. Establishment of a Diatom Herbarium at the Museum of Natural History, UPLB. Publication of a website on the identification up to species level of common diatoms in Marikina River and Batangas Rivers (Pansipit and Palanas) and their diversity index in relation to some abiotic factors. A People Seminars: Importance of the Diversity of the Diatoms on the Sustainability of Marikina and Batangas Rivers (Pansipit and Palanas), with as many as 30 participants, including fisheries, students, professors, researchers, and administrators. Place: Region 4A, Bureau of Fisheries and Aquatic Resources Region 4A, Department of Environment and Natural Resources (MOA/Policy: Policy recommendation for the Sustainability of Marikina River and Batangas Rivers (Pansipit and Palanas) as Possible sources of Supply of Drinking Water and/or as Fish Sanctuary; Policy recommendation on the use of a standard measurement of water quality of Philippine rivers using diatoms as index of water quality. | University of the Philippines Los Baños (UPLB)               | Researchers and Professors in Various Research and Academic Institutions; Students both in Secondary and Tertiary Level of Education; Regional and National Offices of the Bureau of Fisheries and the Department of Environment and Natural People around the river, like the fisherfolks, farmers, etc.  | 01-Jan-23 | 31-Dec-24 | ONGOING                          | 4,964,694          | 2,145,061.03     |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---------------|--|---|---|--|---|---|-----------|-----------|----------------------------------|--------------------|------------------|
|               | Field Testing and performance evaluation of saline tolerant Philippine Tilapia strain cultured in different geographical brackish water ecosystems | Integrity of the environment and climate change adaptation and mitigation | The Philippine Tilapia aquaculture industry has a significant contribution to the national economy. Tilapia is the second largest aquaculture-produced fish species in the Philippines with a total production of 281,114 metric tons valued at Php24.26 Billion in 2021. However, the growth of this industry has become minimal with an average annual production rate of 0.8% from 2012-2021. This declining production trend could be attributed to congested production system in lake and in cages coupled with the dwindling water quality due to mismanaged production (high stocking density, without consideration of the lake carrying capacity). The productivity of lakes and freshwater fishponds in terms of tilapia production appeared to reach its maximum capacity and for the industry to further expand. Farming of tilapia is expected to expand towards the estuarine and brackish coastal areas. Brackishwater ponds and estuarine coastal water cages are seen to have a high potential for growth and expansion of tilapia farming. The research would identify the best performing saline tolerant tilapia strains, existing in the Philippines, when cultured in brackishwater ponds, coastal brackishwater and estuarine cages. The best strain that would exhibit better growth, feed efficiency, survival and harvest yield will be identified as per particular culture environment. Result of this project would be vital in designating particular strain to specific brackishwater and estuarine culture ecosystems in the country.  | Year 1-People and Services: Train and mentor 3-5 tilapia culture technicians and 2 students Places and Partnership: MOU or collaboration with 1 tilapia grower and 2 state college researchersYear 2: Publications: 1 IEC material, Saline tolerant tilapia rearing manual, 2 Academic Journal publicationsProduct: 1 protocol for saline tilapia culture in estuarine cages and 1 protocol for saline tilapia culture in brackishwater ponds People and Services: Train and mentor 3- 5 tilapia culture technicians and 2 students Places and Partnership: MOU or collaboration with 1 tilapia grower and 2 state college researchers | University of the Philippines Visayas (UPV) | Tilapia hatchery operators, tilapia growers, coastal, estuary and river dependent communities.  | 01-Dec-22 | 30-Nov-24 | COMPLETED                        | 4,999,179          | 1,103,596.99     |
|               | Field Testing of Azolla filiculoides and Amaranthus spinosus "Kolis" Leaf Meal for Improved Tilapia in Pond Culture                                | Integrity of the environment and climate change adaptation and mitigation | Tilapia is the most preferred cultured fish species in many tropical and subtropical countries of the world. This has commercial importance in aquaculture because they are highly resistant to diseases, exhibit rapid growth, efficient feed conversion, easy to breed, and have good consumer acceptance (Nyonyie et al., 2011). A variety of factors affecting its growth rate include sex, stocking density, decrease in water temperature, and supplemental feeding (Mizanur et al., 2011 & Lili et al., 2005). Since farmed tilapia is expensive as a feed ingredient, the use of non-conventional feedstuffs has been reported with good growth and better cost-benefit values. The utilization of non-conventional feedstuffs of plant origin had been limited as a result of the presence of various biological activities to mention a few despite their nutrient values and low-cost implications (Sogheim et al., 2006). Therefore, the most important aspect of tilapia farming is to identify economically viable and easily available ingredients for formulating diets that are nutritive and palatable, and have a minimal conversion ratio to give the greater fish yield per application. The research is expected to evaluate the low-cost tilapia diet with Azolla filiculoides or Amaranthus spinosus leaf meal for utilization in tilapia aquaculture. Results from this field testing will be submitted for publication in refereed journals, local conferences, and symposia.   | Publications 2 IEC materials (brochure/pamphlets) and 1 scientific paper Product Feed with 20% Azolla Feed with 47% ASLM People and Services 2 BS in Fisheries Students 6 Farm cooperatives Places and Partnership 1 MOU with LGU of Ramon, Isabela, LGU of Nueva Ecija and University of San Carlos, Cebu City. Economic Impacts Additional income to farmers and development of low-cost feed. Social Impacts Good quality and low cost feeds for tilapia growers.   | Isabela State University (ISU)              | The target beneficiaries of the research will be as follows: Aquaculture industry * fish farmers and fish feed developers/industries may use the results of this project for commercial production of tilapia. Research institutions * results of the study will give insights to researchers about the potentials of plant-based protein diet in tilapia. This might also provide an avenue on the utilization of Azolla and ASLM as feed for tilapia aquaculture. Academic institutions * students and professors will acquire new knowledge on the use of Azolla and ASLM as feed for tilapia aquaculture. Government agencies/policy makers * the results of this study can be used by the policy makers in the formulation of guidelines and regulations on the use Azolla and ASLM as feed for tilapia aquaculture. | 01-Mar-23 | 31-Dec-24 | ONGOING                          | 4,998,750          | 1,567,223.45     |
|               | Field testing of hatchery and nursery production and development of broodstock transport protocols for the native catfish Clarias macrocephalus    | Rapid, inclusive and sustained economic growth                            | The decline in the abundance of native catfish, <i>Clarias macrocephalus</i> , in the rivers, with the introduction of competing catfish species for fish farming being a major factor (Tan et al., 2016). The larger and more popular <i>Clarias batrachus</i> and <i>C. gariepinus</i> have outperformed <i>C. macrocephalus</i> , with studies showing that hybrids between <i>C. macrocephalus</i> and <i>C. gariepinus</i> are more resistant to stress and diseases (Nasution et al., 2004). To address the ongoing decline in aquatic ecosystems, reintroduction efforts are crucial (Lyon et al., 2012), and the selection and conditioning of an appropriate source population is critical to the success of reintroduction (Schreiner, 2011). IJCNSSC, 2013; Foraman, 2014). Given the value of native catfish as an important aquaculture commodity in the Philippines and a highly valued food fish in Southeast Asia, there is a significant potential for developing this species as an aquaculture species (Conza et al., 2008). In the previous project of Serrano, he has successfully explored some feed additives that will enhance both the growth rate and period of sexual maturation in captivity both in male and female <i>C. macrocephalus</i> . His findings are very valuable and now awaits testing both in the hatchery as well as in the field i.e., freshwater ponds. Findings of Serrano's previous research will be tested in the field, as well as in actual hatchery, to come up with a practical protocol for the production of the native catfish <i>C. macrocephalus</i> .   | Publication: total of 3 journal publicationsPatent: 1 patent applicationProduct: Hatchery, nursery and transportation protocolsPeople: 2 MS Place: Linkages with Pangasinan State University and Atlatn State UniversityPolicy: 1 policy recommendation  | University of the Philippines Visayas (UPV) | Freshwater fish farmers, aquaculture researchers, feed manufacturers  | 01-Oct-23 | 31-Mar-25 | ONGOING                          | 4,986,924          | 3,965,845.00     |
|               | Gene-based Identification of Growth Promoting Feed Additives for Milkfish Aquaculture  | Rapid, inclusive and sustained economic growth                            | Milkfish aquaculture is the largest producer and contributor of cultured food fish in the Philippines. However, the current production volume is inadequate to satisfy the public demand for the commodity. At present, as sea-cage production intensifies and expands, demand for juveniles has increased and the supply of nursery-produced milkfish is a constraint in the production. The inefficient growth performance in the nursery and low growth of the fish to reach the size ideal for grow-out are major issues threatening the sustainability and economic viability of milkfish aquaculture. The sea-cage milkfish culture requires bigger juveniles (% 30-100g) that are already capable of utilizing artificially formulated feeds and can withstand strong water currents. There is a need to improve the growth rate of milkfish in the nursery system to accelerate the period for it to attain the size required for sea cages. Nutrients and dietary additives that could accelerate growth to attain the final size are essential to shorten the turnover rate of the nursery system and in effect could lead to more production cycles in the grow-out phase. The proposal intends to accelerate the growth of juvenile milkfish in nursery culture, reducing 30-45 days in the current 90-day culture duration, by elucidating nutrients and dietary compounds that could induce the production of growth-associated hormones including Growth hormone, Insulin-like growth factor, and grelin using molecular tools.  | Publication: 2 Draft scientific article publication Patent: 1 Patent for growth promoting additives using hydrolyzed peptides 1 Patent for growth promoting additive from short-chain fatty acids from fermented biomass Product: 1 Peptide growth enhancing supplement for fish 1 short-chain fatty acid growth supplement for fish People: Support 2 graduate ad 2 undergraduate students Place: 1 MOU with academe (CapSU, NSU, UA) 1 MOU with Private Milkfish Operator Policy: NA   | University of the Philippines Visayas (UPV) | 1. Milkfish growers and nursery operators 2 Feed manufacturing companies 3 Government extension officers.   | 01-Oct-24 | 30-Sep-26 | ONGOING                          | 5,000,000          | 2,881,620.00     |
|               | Out metagenomics and transcriptomics for rapid development of single cell protein (SCP) alternatives to fish meal and probiotics for Chanos chanos | Integrity of the environment and climate change adaptation and mitigation | Production of aquafeeds is predicted to increase from 49.7 million tons in 2015 to 87.1 million tons in 2025 (Hua et al., 2015). The supply of fish meal, the primary source of protein in feeds, will increasingly be scarce given the limited fisheries resources and the threats from climate change. There is an immediate need to develop options. This project proposes to escalate efforts to develop protein alternatives for aquafeed from microbial biomass and hasten the process with a genomics-based approach Single-cell proteins (SCP) from microbial biomass are viable sources of protein for feeds. In addition, SCP production involves the valorization of discards from other food, beverage, or petroleum manufacturing systems, a plus for environmental outcomes (reviewed by Hitala, 2017). Examples of SCP include Australia's Novocis, involving sugarcane bagasse with marine bacteria and algae. Uniprotein, from Denmark, involves methane-associated bacteria. SCPs in diets apparently reduce feed consumption, improve FCR, and develop resistance to disease in shrimp and tilapia (Simon et al., 2019; Glenross et al., 2014). In the Philippines, microbes associated aquafeed projects include UPV's "Juan Algal" an algal paste for milkfish larvae (PCARRD, 2019) "Juan BioBio" for fish cultured in tanks (PCARRD, 2016) and UPB probiotics for aquaculture (PCARRD, 2014). None of these involved SCP production similar to Novocis or Uniprotein. We heard about the struggles to source raw materials and the rising prices. The farmers have shown us gut inflammation and how much they lose with longer feeding times and disease. Our strength is in our ability to use genomics tools, to access microbial databases, scan the web for information, and culture microorganisms. We hope to fast-track SCP development in the country from the former hit-and-raise approach of finding microorganisms and matching them to potential substrates. | Publication: At least 3 journal publications .Patent: At least on patent/ utility model for feed development protocolProduct: At least one novel feed prototypePeople: Two (2) MS students substantially advanced to the completion of their programPlace: Collaboration with industry in the process of protocol development . CapS: Aquaculture Producers Cooperative . Sanelec Feeds Corp.Policy: White paper on SCP-development.   | De La Salle University (DLSU)               | Fish farmers Aquaculture industry Feed development industries Down stream/ value chain players to the industry  | 01-Aug-23 | 31-Jul-26 | ONGOING                          | 14,341,580         | 1,904,932.00     |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---------------|--|---|--|--|---|--|-----------|-----------|----------------------------------|--------------------|------------------|
|               | Improvement of Milkfish larval rearing and nursery culture through Gut Metagenome, transcriptome analysis and gut microbial community manipulations  | Integrity of the environment and climate change adaptation and mitigation | Milkfish is an important food commodity in the Philippines and is considered as the main pillar of the country's aquaculture in terms of value (P40.8 billion, PSA, 2019). Currently, the industry is facing insufficient supply of fry and hampers production efforts thus restraining the growth of the milkfish industry. The Philippines' requirement for bangus fry is close to four billion yearly, but hatcheries can produce only 800 million fry a year. Vulnerability of milkfish production is further aggravated by deformities and low survival of hatchery produced milkfish fry. The reduced survival of hatchery reared milkfish fry is linked to physiological challenges caused by poor genetic quality and environmental issues. The gut microbiota of fish has been shown to play an important role in nutritional provisioning, metabolic homeostasis, and immune defense. Further knowledge of these microorganisms will facilitate the selection of probiotics, prebiotics and chemical compounds with potentials to improve the gut homeostasis and health of fish, which are promising alternatives to antibiotics and would be a helpful tool in designing rearing protocols for efficient hatchery production of milkfish. Generally, the gut microbiota can significantly alter the host's physiology, metabolism of nutrients and exogenous toxic substances, and can significantly affect the immune system. However, only limited information about the metagenomic analysis of fish GI microbiomes is available. The present study will evaluate the gut Metagenomics composition of milkfish fry and juveniles. The milkfish fry and juveniles on overall larval physiology will be evaluated by the transcriptome analysis. Information generated will establish the link between ecogenetic differences and look for direct evidence of functional consequences to understand the physiological fitness mechanism of milkfish larvae. With these information, protocols to produce a better and robust milkfish will be developed thus increasing the survival and yield of the farmer. | Publication<br>1 IEC material<br>2 Journal Article<br>1 Protocol manual on basic metagenomic and transcriptome analysis for fish larvae<br>Patent:<br>1 protocol for milkfish larvae gut metagenomic analysis 1 protocol for milkfish larvae transcriptome analysis 1 protocol for probiotic application on milkfish hatchery and nursery operation<br>Product<br>At least 2 probiotic products 1 process of improving milkfish hatchery and nursery productivity by application of microbial manipulation techniques<br>People<br>At least 1 graduate student<br>Places and Partnerships<br>1 industry and 1 academic partner<br>Policy/Ino   | University of the Philippines Visayas (UPV)                       | Hatchery operators, nursery growers, milkfish growers.   | 01-Jul-22 | 30-Jun-25 | ONGOING                          | 21,035,101         | 3,597,700.37     |
|               | Intestinal Amino Acid Transporters as Indicators of Stimulatory and Inhibitory Effects of Dietary Proteins (Fishmeal, Soybean Meal and Copra Meal) on Amino Acid Absorption in Tilapia ( <i>O. niloticus</i> ) | Integrity of the environment and climate change adaptation and mitigation | The study will use nutrigenomics as a tool in the advancement of aquaculture nutrition research in the country and in filling knowledge gaps related to nutritional inadequacy problems in aquaculture species. Further extensive studies will lead to development of desirable feeds or feeds that are specifically designed depending on the desired quality of fish (e.g. firmness of muscle) in the interest of either the farmer or the consumer. This will give new perspective in nutritional recommendations for aquaculture feeds thus will provide benefits to consumers, entrepreneurs, farmers, and the entire aquaculture industry.   | 1 Biological markers using gene and expression patterns<br>2 Recommended feed ratio based on gene expression<br>3 Gene expression method in evaluating protein/amino acids in aquafeeds<br>4 Recommendation for development of personalized and functional feeds.  | University of the Philippines Diliman (UPD)                       | Knowledge acquired from this project will provide new insights on the effect of feed ingredients on fish that is important in the development of feed and improvement of feed quality. Outputs of this project could be used to complement, re-assess and improve conventional practices in aquaculture. Therefore, this project will primarily benefit the aquaculture feed industry, farmers, aquaculture sector. In addition, the academe (students and faculty researchers) and research institutes will also benefit from this project through thesis/dissertation and collaborations.  | 01-Jul-22 | 30-Sep-24 | COMPLETED                        | 9,400,941          | 504,922.59       |
|               | ISDAAN ni SARAI - Integrated Systems for the Sustainable Development and Advancement of Aquaculture Nationwide   | Rapid, inclusive and sustained economic growth                            | The project will focus on assessing the status of aquaculture in Region IVA with Fishpond Licensing Agreements (FLAs) using GIS/Remote Sensing methods. It is expected that the project to obtain real-time data on the extent and location of aquaculture operations that can be used as a basis to monitor the development of aquaculture areas in selected regions in the Philippines.  | Publication:<br>1 publication in Scopus or WoS<br>2 manual of operators<br>Patent/Intellectual Property:<br>Copyright of manual/Product:<br>Developed monitoring systemA.<br>Manual of operators<br>High-resolution maps showing the spatial distribution and extent of aquaculture activities with FLA in region IVA-A.<br>Data sets for the monitoringA.<br>People Service:<br>At least 1 graduate student is capacitated.<br>Trained BFAR personnel (Region IVA-Place and Partnership:<br>MOU with DA-BFAR/Policy: 1 draft policy brief related to monitoring of FLAs   | University of the Philippines Los Baños (UPLB)                    | BFAR, DA-NFRDI, Aquaculture sector   | 01-Jul-24 | 30-Jun-25 | ONGOING                          | 5,000,000          | 3,390,938.00     |
|               | Mannan Oligosaccharide (MOS) Prebiotic Feed Ingredient for Aquaculture From Bioprocessed Coconut Residue   | Integrity of the environment and climate change adaptation and mitigation | Mannan oligosaccharide (MOS) is the most used prebiotic in aquaculture. It has been shown in various studies to be effective in enhancing the growth and disease resistance of milkfish and other fishes like tilapia, and common carp. MOS is produced from the by-product of mannan, a polysaccharide commonly found in yeast and plant cell walls. Coconut residue or copra meal is the by-product after the extraction of coconut milk either for virgin coconut oil production or household use. It is high in fiber. And the fiber is mostly composed of mannan making it a good source of MOS. The project aims to bioprocess coconut residue using solid state fermentation and a mannanase producing microorganism to produce a MOS prebiotic product that can be used in aquafeeds formulations. The mannanase will produce MOS from the mannan, reducing the fiber content. The fermentation will also improve the protein content. Since coconut residue also contains residual oil, the resulting MOS prebiotic bioprocessed coconut residue can also be used as partial substitute for fish oil, and soybean meal in aquafeeds. The solid fermentation parameters will be optimized using the expertise in bioprocessing that has been developed.  | Publication: At least 2 publications in ISI/Scopus/Journal<br>At least 1 paper presentation in conference/Symposium: At least 1 patentability model for the prebiotic bioprocessed coconut residue (PCR) feed ingredient production/Product: One (1) established process of producing Mannan oligosaccharide (MOS) prebiotic feed ingredient product; Characteristics of MOS produced from bioprocessing of coconut residue.<br>One (1) product (MOS prebiotic feed ingredient feed with MOS prebiotic feed ingredient product enhanced aquafeeds)People: Mentored/Trained at least 2 researchers<br>Mentored/Trained at least 2 researchers, and 1 undergraduate student/Place: At least one partnership with aquaculture or coconut processing stakeholder on further field testing of developed product   | University of the Philippines Los Baños (UPLB)                    | Local farmers engaged in aquaculture farming, LGUs and cooperatives<br>Feed manufacturers and compounders<br>Food industry<br>Academe  | 01-Dec-22 | 28-Feb-25 | ONGOING                          | 4,999,298          | 746,015.50       |
|               | Method Optimization of Digestion and Extraction of Microplastics in Milkfish (Chanos chanos)   | Rapid, inclusive and sustained economic growth                            | Research interest in microplastics has risen due to their occurrence and potential health (toxic) implications. However, in the Philippines, only a few studies were conducted regarding the microplastics ingestion (i.e. bivalves and mussels) in the commonly consumed seafoods. There is still a need for more research which can contribute further understanding of this global pollutant, and possibly address solution/mitigations. Hence, this research proposal will serve as an exploratory study on the detection of microplastic found in milkfish, a major species farmed in our local aquacultures. The spatial distribution of identified microplastics in milkfish found in freshwater, marine and brackishwater systems will be covered in this work.&nbsp;&#x2013;&#x2013; Results from this study may provide identification and correlation of possible sources and distribution of microplastics in fish at different water habitats.  | Publication: "One (1) publication or presentation in scientific forum/conference (Year 2)/Product: "NA"/Product: "1. Optimized procedure on microplastics isolation from milkfish (Year 1)<br>2. Microplastics profile of freshwater and brackish water milkfish (Year 1 to Year 2)"People: "1. At least Two (2) staff trained on Microplastics analysis (Year 1 to Year 2)<br>2. At least one (1) MS or related field graduate (Year 1 to Year 2)"Place: "NA"/Policy: "NA"  | DOST-Industrial Technology Development Institute (DOST-ITDI)      | Policy makers<br>Small-scale aquaculture sector<br>Local barangays<br>Everyday Filipino fish consumers   | 01-Jan-23 | 31-Dec-24 | ONGOING                          | 3,223,965          | 1,775,825.74     |
|               | M-Eye Fry Counter: An Innovative Machine Vision-based Precision Fry Counting Solution to Streamline Milkfish Fry Distribution  | Rapid, inclusive and sustained economic growth                            | Philippines <sup>66</sup> , being the 2nd top producing country of milkfish worldwide has produced 315 thousand tons of milkfish in 2020. This amount of production also equates to massive amount of milkfish fry demand. Currently, the Philippine Milkfish Industry has a demand of at least 5 billion milkfish fry annually, to which about 2.3 billion are currently provided by the local hatcheries either private or government owned. According to Bureau of Fisheries and Aquatic Resources, Philippines have an existing 36 milkfish hatcheries, 20 of which are government owned and 16 are private. These local hatcheries are currently putting effort to sustain a self-sufficient supply of milkfish fry. Philippine Milkfish Industry is already a well-established industry in the Philippines. However, development in terms of automation/mechanization in the operations are lagging compared to other countries. One best example is the fry counting operations of milkfish hatcheries, to which until now, uses manual methods in its operations. Philippine having a 2.5 billion milkfish fry produced, to which all of these were counted manually, only shows the tedious and inefficient hatchery operations and technology that the Philippine Milkfish Industry currently have. With that said, the proposed project aims to provide new technology to answer the current problem on manual counting of milkfish fry to elevate the current hatchery methods into a more efficient and productive processes.   | Publication: One (1) scientific paper for the design and development of the system:<br>One (1) developed operators and maintenance manual:<br>One (1) set of IEC materials ( pamphlets/flyers about the functions, features, and specifications of the system)/Patent: One (1) Utility Model registration for the invention/Product: One (1) Fry counter equipment/People: Five (5) trained personnel to operate and maintain the system/Place: One (1) MOU with DA-NFRDI, BFAR-NFDC, and AP/Ino (1) MOU with Private Hatchery Operator/Policy: None   | DOST-Metals Industry Research and Development Center (DOST-MIRDC) | Aquaculture industry in the Philippines; Milkfish hatchery operators and grow out farmers; System integrators and fabricator in the Metals, Engineering and Allied Industry involved in aquaculture.   | 01-Aug-24 | 31-Jan-26 | ONGOING                          | 5,000,000          | 3,267,168.60     |
|               | Molecular Detection of Pathogens in Mangrove Crab: A Step Towards Ensuring a Sustainable Mangrove Crab Aquaculture Industry  | Rapid, inclusive and sustained economic growth                            | Many Filipino farmers in coastal areas made their living by raising mangrove crab, <i>Scylla</i> spp. The nursery and grow-out operations in these areas use a variety of culture approaches that significantly improved production. Western Visayas is the major producer of mangrove crab, with Capiz as the top producer in the region. In spite of the rapid development in the culture mangrove crab, zoonosis and infectious disease-related deaths are major issues during the grow-out phase. To address these problems during the culture operations of mangrove crab, this proposed project aims to detect pathogens of mangrove crab using conventional PCR as an early intervention during culture operations of this species. Through this study, it is expected that this will result in creating early interventions in the management during culture of mangrove crab by way of identifying potential pathogens in the host before disease epidemics are manifested.   | YEAR 1<br>YEAR 2<br>Publications<br>One (1) publishable research article for submission to reputable peer-reviewed scientific journal<br>One (1) publishable research article for submission to reputable peer-reviewed scientific journal<br>Patents/Intellectual Property<br>At least two (2) conventional PCR protocols on molecular detection of common and emerging pathogens from Year 1/Product: YY male and SR YY female saline tolerant tilapia population produced/People: at least two (2) undergraduate and/or graduate students supported/Place: one (1) research partnership at the Philippine Genome Center Visayas in Magway, Iloilo/Policy: 2 Publications: at least two (2) publications in reputable ISI journals/Patent: At least one (1) patent of the protocol/product applied/Product: all natural XY male saline tolerant tilapia population through YY male technology produced/People: at least two (2) undergraduate and/or graduate students supported/Place: one (1) research partnership at the Philippine Genome Center Visayas in Magway, Iloilo | University of the Philippines Visayas (UPV)                       | Mangrove crab grow-out and hatchery operators<br>At least 4 awareness of sending samples to the laboratories for routine diagnosis as part of the early intervention plan could mitigate future losses due to mortality by providing decision should the pathogen is detected in the facility<br>Consumers At least 4 The consuming will be assured of a healthy mangrove crab for consumption<br>Aquaculture Researchers At least 4 This underscores the importance of early detection of the disease-causing pathogen and water researchers shall be crafted on prevention and treatment<br>Fisheries extension workers At least 4 The baseline information that they obtain from this study will be utilized in educating and creating awareness to the mangrove crab farmers on the importance of disease diagnostics on early intervention as part of the health management approaches in mangrove crab aquaculture<br>Educators At least 4 For those who are teaching Diseases of Aquatic Animals and Health Management, they incorporate in their lectures and laboratory activities the various techniques on molecular diagnostics and to create hands-on activities along that line, to better equip students on disease diagnostics<br>Policymakers At least 4 This will provide data on drafting policy on routine diagnosis of infectious | 01-Aug-23 | 31-Jan-25 | ONGOING                          | 4,999,981          | 3,915,510.30     |
|               | Molecular Marker Assisted YY Male Tilapia Production   | Poverty reduction and empowerment of the poor and vulnerable              | This research would try to apply the use of sex specific marker as a selection marker for the efficient development of a YY male saline tolerant tilapia. To our knowledge, development of a YY male saline tolerant tilapia for the first time to be developed in the region. And hopefully it is the Philippines that could lead in the development of this technology that could be used for the efficient aquaculture of saline tilapia. This proposed project further hopes to increase the national production of all XY natural male saline tolerant tilapia through YY male technology and increase the acceptability and marketability of saline tolerant tilapia to general consumers. The findings of this research proposal will have a significant contribution to human food security and will contribute toward SDG2 Zero Hunger.   | At least two (2) conventional PCR protocols on molecular detection of common and emerging pathogens from Year 1/Product: YY male and SR YY female saline tolerant tilapia population produced/People: at least two (2) undergraduate and/or graduate students supported/Place: one (1) research partnership at the Philippine Genome Center Visayas in Magway, Iloilo/Policy: 2 Publications: at least two (2) publications in reputable ISI journals/Patent: At least one (1) patent of the protocol/product applied/Product: all natural XY male saline tolerant tilapia population through YY male technology produced/People: at least two (2) undergraduate and/or graduate students supported/Place: one (1) research partnership at the Philippine Genome Center Visayas in Magway, Iloilo  | University of the Philippines Visayas (UPV)                       | Broodstock growers, Hatcheries, Consumers, Tilapia industry, and Researchers   | 01-Mar-23 | 28-Feb-25 | ONGOING                          | 4,953,073          | 1,935,763.11     |





| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---------------|---|---|---|--|--|---|-----------|-----------|----------------------------------|--------------------|------------------|
|               | Product process optimization at up-scale production and market planning for low-salt fermented mussel (Perna viridis) sauce   | Poverty reduction and empowerment of the poor and vulnerable              | <p>The development and production of salt-fermented mussel sauce was a challenge to come up with potential functional food or ingredient (Peralta et al. 2019). However, in any product development process, the product needs to undergo scale-up production. The proposed project intends to conduct a product process optimization to determine a feasible and profitable level where feed costs in production can be offset by the product volume production and eventually reducing product final cost. Process modifications and innovations, if applicable, can be done to efficiently increase yield without compromising end-product quality. Financial viability in the production of low-salt mussel sauce will necessitate adopting an effective pricing policy and cutting down its production cost. The increase in production capacity will spread out its feed cost resulting to a lower cost per unit of output.</p> <p>Market promotion is significant in translating R&amp;D results into technological products for the use and benefit of society. Market promotion strategies will be designed for the product to highlight its features and benefits and will introduce the product to consumers through institutional end-users and market influencers. Lastly, there is also a need to come up with concrete science-based policy recommendations that would address effective sustainable resource management. This could be achieved through the crafting of a policy brief that includes all issues, identified policy options, and recommendations.</p>  | <p>Zls<br/>6Pa<br/>Year 1<br/>Year 2<br/>Total<br/>Publications<br/>8nbsp;<br/>3 papers published and/or training/manual guide<br/>3</p>   | University of the Philippines Visayas (UPV)                  | Mussel farmers; Fish sauce industry (manufacturing); Consumers; Local government units; Fisherfolk Organizations; Academe   | 01-Dec-22 | 30-Nov-24 | COMPLETED                        | 4,995,184          | 1,295,156.73     |
|               | Production and evaluation of dried microalgal biomass for improved shelf-life and product diversification   | Integrity of the environment and climate change adaptation and mitigation | <p>Microalgae are known to be beneficial in a diverse field of applications but, very limited intensive studies have been conducted for its post-harvest development and its other functionality aspects. One of the challenges faced by local producers is maintaining microalgal post-harvest quality. The high moisture and nutrient-rich medium (fresh and paste form) make it susceptible to fast deterioration. In order to keep a fresh, it needs to be stored in refrigerated temperature, and storage life varies (few days to weeks only) depending on the harvesting method. If proper storage conditions are not properly maintained, supplies could lead to deterioration and wastage. It also makes product transportation very challenging. In addition, the production is based on the immediate market demand to prevent deterioration and wastage during storage. Producers could not stockpile supplies during good weather conditions, and reserve for eventual market demands.</p> <p>The study was conceptualized to be able to address this issue through the different post-harvest methods of moisture removal. In addition, finished products will be characterized using physico-chemical analyses and storage stability studies. The findings of this study aim to help microalgal biomass producers by providing in-depth data about the potential products to be developed, competitive market advantage, and expanded applications.</p> <p>The bottleneck in Philippine production of <i>Macrobrachium rosenbergii</i> is not the number of prawn culture ponds and cages, but the production of postlarvae in the hatchery. The production is constrained by the lack of postlarvae for grow-out, but if resolved, has a good potential for the aquaculture industry. <i>M. rosenbergii</i> is a promising alternative to tiger shrimp due to its high market value, high export potential and low susceptibility to diseases. Many potential investors who visited MSU Naawan and expressed interest to venture into freshwater prawn culture have inquired if MSU Naawan can do something to produce all male prawn fry, to reduce the head-body ratio of the prawn, to reduce the enormous size of the claws, and to delay the spawning of young female prawns. Their contention is that an improvement of these characteristics would make the freshwater prawn more attractive as an aquaculture species. This inquiry is clearly suggestive of the need for innovative researches that are within the realm of genetics and biotechnology.</p> <p>The history of the hatchery operations of <i>M. rosenbergii</i> in Mindanao can be traced from minor activities in different locations by various institutions. Earlier attempts to produce postlarvae of <i>M. rosenbergii</i> in hatcheries were conducted in various government and private sectors but sustainability of the operation was not attained to date. In fact, in Northern Mindanao, there are numbers of hatchery facilities for freshwater prawn previously reported in 2005 and 2007. Nevertheless, continuous operation of these hatcheries were not sustained to date and these were converted for other culture commodity such as tilapia.</p> | <p>Patents/IP<br/>At least 1 in refereed ISI-indexed scientific journal<br/>Patent: 1 possible utility model<br/>Product: at least 1 developed and characterized dried microalgal biomass product<br/>People: at least 2 project personnel trained in research and laboratory techniques<br/>At least 1 MSU student trained<br/>Place: partnership with at least 1 local producer of microalgae (Algaon Aquaeed Manufacturing/Policy: n/a</p>  | University of the Philippines Visayas (UPV)                  | <p>1. Local microalgae producers<br/>2. Consumers of microalgae: Aquaculture and Food Industry 3. Product developers in Food, Health, Nutrition, Pharmaceutical Industry<br/>4. Academe</p>   | 01-Jul-22 | 31-Dec-24 | ONGOING                          | 4,989,330          | 507,097.54       |
|               | Production of all-male and fast-growing progeny using phytoandrogen for sustainable seedstock of giant freshwater prawn <i>Macrobrachium rosenbergii</i> (De Man, 1879) | Integrity of the environment and climate change adaptation and mitigation | <p>The bottleneck in Philippine production of <i>Macrobrachium rosenbergii</i> is not the number of prawn culture ponds and cages, but the production of postlarvae in the hatchery. The production is constrained by the lack of postlarvae for grow-out, but if resolved, has a good potential for the aquaculture industry. <i>M. rosenbergii</i> is a promising alternative to tiger shrimp due to its high market value, high export potential and low susceptibility to diseases. Many potential investors who visited MSU Naawan and expressed interest to venture into freshwater prawn culture have inquired if MSU Naawan can do something to produce all male prawn fry, to reduce the head-body ratio of the prawn, to reduce the enormous size of the claws, and to delay the spawning of young female prawns. Their contention is that an improvement of these characteristics would make the freshwater prawn more attractive as an aquaculture species. This inquiry is clearly suggestive of the need for innovative researches that are within the realm of genetics and biotechnology.</p> <p>The history of the hatchery operations of <i>M. rosenbergii</i> in Mindanao can be traced from minor activities in different locations by various institutions. Earlier attempts to produce postlarvae of <i>M. rosenbergii</i> in hatcheries were conducted in various government and private sectors but sustainability of the operation was not attained to date. In fact, in Northern Mindanao, there are numbers of hatchery facilities for freshwater prawn previously reported in 2005 and 2007. Nevertheless, continuous operation of these hatcheries were not sustained to date and these were converted for other culture commodity such as tilapia.</p>  | <p>Publication<br/>1 paper submitted for publication in refereed journal<br/>1 Manual on hatchery production of <i>M. rosenbergii</i> for conservation and adaptive management<br/>Production of at least four (4) IEC materials which include brochures, pamphlets among others that contain relevant information about the project, rearing protocols, technology generated and the like.<br/>Patent/Intellectual Property<br/>1 IP disclosure for microsatellite markers developed<br/>1 IP disclosure for the utilization of pine pollen as sex inversion and growth enhancer for <i>M. rosenbergii</i><br/>Product/Process<br/>At least 10 sites for broodstock sources identified<br/>At least 50 Broodstock collected<br/>20 Primer pairs sequenced<br/>Production of 80,000 quality <i>M. rosenbergii</i> post larvae<br/>At least 10 microsatellite (SSR) markers developed<br/>People Services<br/>At least 5 mentees and collaborators trained on the hatchery technology of <i>M. rosenbergii</i><br/>At least 5 Undergraduate/graduate students supported<br/>(3 Undergraduates, 2 graduate students)<br/>(3 Undergraduate/graduate students trained (On-the-Job Trainings and immersions)<br/>At least 10 mentees and collaborators trained<br/>(At least 5 Undergraduate/graduate students supported (3 Undergraduates, 2 graduate students)<br/>10 Undergraduate/graduate students trained (On-the-Job Trainings and immersions)</p> | Mindanao State University (MSU-Naawan)                       | This is a science-based project which aims sustainability and food security for the benefits of various stakeholders — Fish farmers, people's organizations and NGO's — Local government units — Academic and research institutions<br>Researchers and students | 01-Aug-23 | 31-Jul-25 | ONGOING                          | 4,999,883          | 1,135,052.46     |
|               | Profiling of Selective Markers of Microplastics in Milkfish and Water Samples Using TG-GCMS   | Rapid, inclusive and sustained economic growth                            | <p>Our current project for CY 2023-2024, <b>Method Optimization of Digestion and Extraction of Microplastics in Milkfish (Chanos Chanos)</b> focuses on the spatial distribution of microplastics in milkfish originating from aquafarms with different water habitats. This mainly uses the optical microscope and the Fourier Transform Infrared (FTIR) Spectroscopy to identify the morphological properties and the composition of detected microplastics. Moreover, the current project identified gaps such as, low precise size resolution of particles.</p> <p>In this proposal, the project team aims to utilize a novel approach in the Philippines in microplastic studies by employing the Thermogravimetric Analyzer (TGA) coupled with Gas Chromatography Mass Spectrometer (GCMS) method. The profile of the selective markers of microplastics present in seawater and milkfish samples will be studied using Thermogravimetric Analyzer coupled to Gas Chromatography Mass Spectrometer (TG-GCMS). This thermo-analytical equipment will be utilized for the semi quantitative analysis of microplastics. The first phase of the study is the establishment of a method to analyze microplastics. The second phase is the application of the TG-GCMS-developed method to environmental samples and milkfish collected from aquafarms in the open water systems. Specifically, this study focuses on using another analytical tool for the detection of microplastics and address the gaps identified in the first project rather than the application of the optimized digestion and microplastic extraction methods in the on-going project.</p> <p>A developed method through TG-GCMS as well as the corresponding profile of the microplastics collected from different sources will be generated from the proposed study. Furthermore, in the Philippines, this technique has not been fully explored as an alternative method to identify microplastics. Hence this will also evaluate the advantages and limitations of TG-GCMS in the detection of synthetic polymers in micro sites.</p>   | <p>IP/Year 1/Year 2/Publication/NA/One publication or presentation in scientific forum/conference/Products/Optimized procedure on microplastics analysis using TG-GCMS from Milkfish/Comparison of the extent of microplastics collected from different sources/Comparison of the extent of microplastics collected from different sources/Bureau of Fisheries and Aquatic Resources regional offices/Bureau of Fisheries and Aquatic Resources regional offices/Year 1 &amp; 2/People Services/At least two (2) staff trained on Microplastics Analysis/Policy/Advocate safer milkfish sourcing based on the results of the study</p>   | DOST-Industrial Technology Development Institute (DOST-ITDI) | Target beneficiaries include Researchers, Policy makers, Small-scale aquaculture sector, Local barangays, and everyday Filipin/o fish consumers.  | 01-Dec-24 | 31-May-26 | ONGOING                          | 4,999,962          | 3,440,320.00     |
|               | Reducing mortalities in crabble packaging and trading for better management of mangrove crab farms  | Integrity of the environment and climate change adaptation and mitigation | <p>This project is based on the results of previous mangrove crab projects of DOST-PCAARRD and the recommendations from the technical panel. Focused group discussions with six of the largest mangrove crabble producing regions in the Philippines show that mangrove crabble packaging materials need to be evaluated during transport and when purchased from locations with a huge difference in environmental conditions. The current packaging materials need to be evaluated for effectiveness and we need to continue improving the existing Ninmango approach to provide farmers with a way to choose the best source of crabs for their farms. To address these issues, the study will document the stress levels of crabs in different packaging materials and propose an alternative design based on the results. It will select variables in water parameters in Philippine coasts to ground truth Alimango, which is still based on modes and satellite data, and improve awareness and increase engagement of local communities in understanding coastal ecosystems by employing a citizen science approach.</p>  | <p>Publication: Year 1 - Training manual for citizen science activities on (1) water monitoring, (2) mangrove vegetation assessment, and (3) mangrove crab species monitoring<br/>Year 2 - 3 papers drafted for publication<br/>Patent: N/A<br/>Product: Year 1 - Preliminary set of markers for stress determination in crabble. Preliminary design of improved crabble packaging<br/>Year 2 - Database of water parameters in target sites. Design of an improved crabble packaging for transport. Best practice in transporting crabs<br/>People: Year 1 - 30 additional coastal community members trained to collect information on the ground. Year 2 - 30 additional coastal community members trained to collect information on the ground. 3 MSU students supported<br/>Place: Year 1 - 2 - MOUs with LGU/ Government agencies in Regions 1, 2, 5, 8, and 10/Policy: Year 2 - 1 policy recommendation on improved management of mangrove habitats to help mitigate the impact of climate change and anthropogenic factors on the wild populations of mangrove crabs</p>  | De La Salle University (DLSU)                                | Mangrove crab stakeholders; Youth groups; Women's groups with environmental concerns; Fishing communities; Philippine fisheries industry; local schools and state universities; environmental managers, LGUs, NGOs  | 01-Aug-23 | 31-Jul-25 | ONGOING                          | 4,994,792          | 1,259,948.00     |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---------------|--|---|--|---|--|--|-----------|-----------|----------------------------------|--------------------|------------------|
|               | SMuG-UP: Sustainable Strategies for Mussel Glycogen Upscale Production   | Poverty reduction and empowerment of the poor and vulnerable              | Phase 1 of the mussel glycogen project has established that the three Philippine mussels: <i>Perna perna</i> , <i>Modiolus philippinensis</i> and <i>Mytilus striatatus</i> are good sources of glycogen. The extraction and isolation of glycogen from these mussels, particularly <i>Perna perna</i> , provides additional value to green mussels especially even for green mussels affected by red tide. The occurrence of red tide for months causes economic losses to mussel farmers. To further add market value to the mussel glycogen, we need to develop products that utilize mussel glycogen and can be commercialized or made available in the Philippine market. This adding value will result in having more buyers of green mussels aside from the food business sectors. In the extraction of glycogen from mussels and in cosmetic product development, farmers of the local community will be the source of the green mussels. This in effect will contribute to more participation of women in product development as they also participate in the mussel production in preparation of the culture, harvesting and preparation of mussels for selling. In order to highlight the economic importance of producing glycogen, the group proposed to produce glycogen in a scale that it can be commercialized and used by the cosmetic industry. Pilot scaling of the production is an essential step toward the commercialization of glycogen from mussels. This study will help establish an optimized production process. Moreover, it will test the feasibility of the production process and identify potential problems that may arise during full-scale production.   | Expected Output<br><br>Year 1<br><br>Year 2<br><br>Publication<br><br>Abstract:<br><br>1 draft article submitted to a peer-reviewed journal for possible publication<br><br>Patent/Intellectual Properties<br><br>Abstract:<br><br>1 optimization process, and 1 improved quality of the glycogen product.  | University of the Philippines Tacloban College (UP Tacloban) | Mussel farmers - value addition of their products, industry - to produce glycogen which will be used in the development new cosmetic products  | 01-Jun-24 | 30-Nov-25 | ONGOING                          | 4,999,530          | 4,070,183.00     |
|               | Supporting Cyanotoxins Risk Assessment through Nuclear and Isotopic Techniques for Food Safety and Water Quality Management of Freshwater Lake Systems | Rapid, inclusive and sustained economic growth                            | Freshwater cyanobacterial blooms (cyanobacteria) has been in the rise globally in recent years. The secondary metabolites produced during these blooms are collectively called cyanotoxins, which are known hepatotoxic, cytotoxic, or genotoxic agents. The presence of cyanotoxins in the waters and fishes in areas with cyanobacteria indicates a potentially underestimated exposure routes for human intoxication. The Laguna Lake, which is the largest lake in the Philippines, provides freshwater reserve and resource for the fisheries industry. However, extensive fisheries and aquaculture practices, accompanied by nutrient over-supply and effect of climate change, have caused recurrent episodes of cyanobacteria over the years thus putting the health at high risks of intoxication through the consumption of fish and water likely contaminated with highly noxious cyanotoxins. The lack of detailed assessment of toxin and other metabolite levels released in the waters or accumulated in fishes, and the non-implementation of water safety regulations call for a timely and more efficient monitoring and management approach. The proposed project intends to support the existing analytical capabilities as well as promote nuclear technologies in the development of risk assessment tools to effectively monitor cyanotoxins and help implement measures and policies towards sustainable management of the lake. The overall program will comprise two R&D components: (1) toxin and/or metabolic analysis of the bloom-forming algal species, lake waters and farmed fishes using advanced analytical methods to support risk assessment strategies; and (2) development of an aptamer-based test kit through radiation-induced graft polymerization (RIGP) technique to augment the current capabilities for toxin detection and decontamination. We anticipate that the proposed project will increase our knowledge and understanding of inland water algal blooms, cyanotoxins in foods farmed using waters that may contain cyanotoxins, and their potential effects on human and environmental health for a more effective management of the lake and its resources. | Publication: Attached file (DOST Form 5-B - Expected Outputs)<br>Two (2) research papers for dissemination of findings and promotion of technology/Patent: Attached file (DOST Form 5-B - Expected Outputs)<br>Three (3) (Pa: 1 patent, 1 utility model, & 1 trademark)<br>Discovery & development of reagent, processes, and utilization of Aptamers & RIGTO: Attached file (DOST Form 5-B - Expected Outputs)<br>Two (2) products: Aptamer & Prototype test kit (RIGTO)/People: Attached file (DOST Form 5-B - Expected Outputs)<br>Two (2) undergraduate/graduate thesis students/Place: Attached file (DOST Form 5-B - Expected Outputs)<br>Establish one (1) new collaborative partnership with the Laguna Lake Development Authority (LLDA) as technology adopter/Policy: Attached file (DOST Form 5-B - Expected Outputs)<br>Science-based recommendations to adopt toxin risk analysis matrix in the formulation of regulations & policies in the management of Laguna Lake resources and activities to safeguard the environment and public health   | DOST-Philippine Nuclear Research Institute (DOST-PNRI)       | The target beneficiaries include the following industry:<br><br>regulatory & resource management agencies; fisheries and aquaculture sectors that include the common fisherfolk, fish pen/age owners; food & export industry that includes the farmed fish product developers and exporters; general public. | 01-Jan-23 | 31-Dec-24 | ONGOING                          | 11,901,181         | 3,343,645.60     |
|               | Thraustochytrid Cultivation in Wastewater for Polyunsaturated Fatty Acid Production as Alternative Fish Feed Ingredient for Fish and Seafood Products  | Integrity of the environment and climate change adaptation and mitigation | The demand for aquaculture products and docosahexaenoic and eicosapentaenoic acids (DHA and EPA)-enriched food will continue to increase, but the production using fish oil dependent on optimum of fish will eventually reach their limits. If the technology in this project is implemented for alternative fish oil production, it will contribute to the realization of a robust and sustainable fishery, as well as the development of new industries such as production of high-value poultry products and human supplements. The novelty of this project in the Philippines is centered on using wastewater streams as substrate for growing thraustochytrid meant to replace or enrich fish feed. This methodology of culturing thraustochytrids in wastewater offers a number of advantages addressing particular problems in the Philippines: 1) alternative and more sustainable source of fish oil for the aquaculture industry, thereby lessening the demands of fish oil meant for human consumption, which in the long run can decrease incidences of overfishing, 2) recycling organic residuals and wastes as an improvement of wastewater treatment technology towards zero-waste discharge, and 3) decreased cost associated with feeding valuable high-PUFA to farmed fish, that ultimately helps the aquaculture industry.  | 6PYear 1Year 2Year 3Publication4 publications in scientific journalsAt least 1 paper/poster presentation/Patent/ Intellectual Property/ at least 3 patents on improved treatment technology for foot waste/water/optimized conditions for the propagation of thraustochytrids using low-cost substrates and organic residuals; and advanced aqua feed formulation with thraustochytrid/ Product 1 product - Thraustochytrid biomass as alternative fish oil for farmed fish and seafood products/People and Services: MS students 2 MS student 2 MS student/Places and Partnerships 3 collaborations (Nishinomiya University (Japan), Institut Teknologi Sepuluh Nopember (Indonesia), and UP Visayas/Policy/At least 2 Policy recommendations: 1. use of alternative industrial or manufacturing wastewater treatment methods aimed at zero-liquid waste discharge 2. sustainable sources of fish oil for animals, fish, and seafood products to lessen competition for human consumption and lessen overfishing due to the demands of fish meal and fish oil/Social Impact/ Increased knowledge and awareness on the social contributions of the projects among the three countries, particularly in the use of sustainable resources in aquaculture and livestock feeding/2. Enhanced exchange of knowledge, skills, technology among relevant stakeholders for the realization of the positive effects of recycling carbon systems through the use of organic residuals and high-organic wastes and wastewaters for production of highly valuable organic products/3. Strengthened cooperation between research institutions and stakeholders (food and beverage processing industries, aquaculture industry) towards achieving technologies that solve premier issues in the society (waste and wastewater management, high-cost feed products for aquaculture and livestock overfishing/Economic Impact/ Fish feed or fish ingredient from the thraustochytrids can be commercialized and sold to fish farmers for a much lower cost decreasing operation and maintenance cost in seafood product-rearing. 2. Using wastewater streams and in the long run, solid wastes, for the purpose of producing highly valuable commodities, like microbial oil, indirectly improves the condition of our environment since they are no longer disposed in the environment like our waterways and land, thereby lessening socio-economic concerns regarding environmental pollution. | University of the Philippines Los Baños (UPLB)               | 1. Scientific Community<br>2. Feed manufacturing industry<br>3. Aquaculture Industry<br><br>Early career researchers   | 01-Apr-22 | 31-Mar-25 | ONGOING                          | 11,387,157         | 4,898,138.81     |
|               | Utilization of fruit processing waste as a source of prebiotics and immunostimulants for the development of healthy and improved aquaculture feeds     | Poverty reduction and empowerment of the poor and vulnerable              | The fruit processing industries in the Philippines are thriving, however, these industries produced a significant amount of waste. If unutilized they can cause negative effects in the environment (e.g. clogging of waterways due to indiscriminate disposal of waste, emission of greenhouse gases such as methane during the decomposition process). Pomace and peelings are common waste produced and are discarded after fruit processing. These waste products are rich in fiber and still contain a significant amount of bioactive compounds. Thus, they can be a good source of prebiotics and antioxidants that can improve the health and growth of the organism. Hence, these wastes can be utilized as feed ingredients to develop healthy and improved aquaculture feeds. This proposed research project plans to develop aquaculture feeds for tilapia and/or shrimp to utilize pineapple and calamansi wastes which are abundant in Mindanao. Furthermore, there are already established fruit-processing industries for both commodities thus supply of these fruit-processing by-products is readily available. Further, the present study will also determine the nutritional profile and antioxidant activities of fruit waste. Further the project will also utilize and optimize the fermentation process to improve nutrient availability and minimize anti-nutritional factors present in the fruit waste. The study will also determine the optimum inclusion rate of fermented and unfermented fruit waste in the diet of saline tilapia and shrimp, as well as evaluate their physiological effect on the cultured organism if they can modulate immune response as well increase the beneficial microorganism in the gut.   | Publication: (1) Publications on the nutritional profile, antioxidant activities and levels of anti-nutritional factors in fermented and unfermented fruit waste meal<br>(2) Publications on the nutritional profile, antioxidant levels of the formulated diets<br>(3) Publications on the growth and physiological response of the cultured organism fed with different inclusion levels of fermented and unfermented fruit waste/Patent: Utility Models<br>(1) A Optimized method for processing fruit waste meal as feed additive<br>(2) Optimized methodology for fermentation of fruit waste<br>(3) Feed formulation with optimum inclusion of fermented fruit waste meal (calamansi or pineapple)<br>(4) Feed formulation with optimum inclusion of fermented fruit waste meal/Product: (1) Formulated feeds with unfermented fruit waste as feed additive<br>(2) Formulated feeds with fermented fruit waste as feed additive<br>(3) Unfermented fruit waste meal<br>(4) Fermented fruit waste meal/People: 2A, MS Student<br>2A, Ph. D. Student/Place: UP Visayas Iloilo Science and Technology University Fisheries Biotechnology Center-National Fisheries Research and Development Institute Mindanao State University-Buug, Charles and Charis Food Products DOLE Pineapple Philippines/Policy: (1) Policy recommendation that will utilize fruit processing waste as sustainable sources of feed additive A.  | Mindanao State University (MSU-Naawan)                       | Feed industry<br>Aquaculture industry<br>Researchers<br>Students<br>Fruit processing industry<br>Government agencies (BFAR, NFRDI), and universities   | 01-Feb-23 | 31-Jan-25 | ONGOING                          | 4,998,347          | 1,850,524.37     |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|--|---|---|--|--|---|--|-----------|-----------|----------------------------------|--------------------|------------------|
| Development of a Framework for Resource Management, Mitigation of Impacts, and Guidance Towards Rational Utilization of <i>Mytilus</i> strigata in the Philippines | Project 1. The fishery, socio-economic aspect, and governance of <i>Mytilus</i> strigata in Philippine waters                                       | Integrity of the environment and climate change adaptation and mitigation | A DOST-PCAARRD-funded study showed that <i>Mytilus</i> strigata, a non-indigenous mussel species, has infested Philippine waters (Montecarlo et al., 2021). The same reported that the occurrence of this alien species has become both a boon and a bane among local communities in coastal areas of the country. <i>M. strigata</i> has emerged as a source of human food and has demonstrated the potential of being a source of income for local communities. The caveat, however, is that the non-indigenous species has caused negative impacts in other communities particularly in areas where shellfish harvesting and farming are considered traditional livelihood activities. The non-indigenous species have been shown to outcompete local shellfish commodities, resulting in decreased production of cultured shellfish, and loss of livelihood. This study, therefore, aims to develop draft recommendations on the management of <i>Mytilus</i> strigata in the country and guidance on the utilization of <i>M. strigata</i> , especially in areas where infestation has occurred. This is to help prevent the spread of the indigenous mussel species in non-infested sites and, for those who utilize the resource, to ensure that these products are safe for consumers.   | Publication:<br>2 manuscripts submitted to WoS- or Scopus-indexed journals;<br>2 brochures on <i>M. strigata</i><br>Patent: IP- copyright for published material<br>Products:<br>1 Occurrence and Vulnerability GIS Map<br>1 website developed;<br>1 video documentary on <i>M. strigata</i> in the Philippines<br>People and Services:<br>3 MS and/or BS students supported through their thesis' special problem;<br>1 scientific meeting conducted<br>1 consultative meeting with DENR and other key agencies<br>Places and Partnership:<br>3 MOUs/MOAs inked with NGAs/Academe (i.e., BFAR/NFRDI, DENR, MSU Naawan)<br>Policy:<br>1 policy paper submitted to relevant agencies<br>Social Impact<br>Sustainable utilization of mussel resources<br>Economic Impact<br>Livelihood protection (for shellfish farmers) and livelihood promotion (for residents in infested areas) | University of the Philippines Visayas (UPV) | Target beneficiaries of the project are shellfish farmers, collectors, and vendors, local government units, national government agencies (DENR, BFAR), peoples' organizations, industries, mentored students and young researchers from the academe.   | 01-Apr-23 | 31-Mar-25 | ONGOING                          | 7,396,286          | 3,072,230.45     |
| Development of a Framework for Resource Management, Mitigation of Impacts, and Guidance Towards Rational Utilization of <i>Mytilus</i> strigata in the Philippines | Project 2. Biological and Ecological Aspects, and Socioeconomic Impact of the Non-indigenous Mussel <i>Mytilus</i> strigata, in Newly Infested Area | Integrity of the environment and climate change adaptation and mitigation | <i>Mytilus</i> strigata, a possibly invasive mussel, was recorded for the first time in the Philippines in 2014. Established populations throughout the country's major islands and eventually spread to the southern region of the country in just seven years (i.e., Luzon, Pangasinan, and Mindanao). To develop effective policies for the management and potential use of biological invasions, knowledge of the species' biology and ecology, effects on native species, and socioeconomic effects is essential. Because we still know very little about this species, this study project aims to fill in knowledge gaps about its biology, the affecting biophysical conditions, and socioeconomic implications in Pangul Bay, southern Philippines. This would result in the formulation of policy recommendations on the management and possible utilization of this non-indigenous mussel species which would serve as a model/reference site. Ultimately, the expected outcome of the project is to improve the resilience and adaptive capacity of local communities in the country considering this biological invasion.  | Publications<br>3 scientific papers submitted for publication<br>3 IEC material produced<br>Patent/Intellectual Property<br>1 copyright for the pamphlet<br>Product<br>1 Distribution map of <i>M. strigata</i> in Pangul Bay<br>2 Initial information on reproductive and population dynamics of <i>M. strigata</i><br>People and Services<br>1 Graduate student (MS)<br>3 Undergraduate students<br>1 Training on monitoring and surveillance (at least 10 participants)<br>1 Graduate student (MS)<br>2 Undergraduate students<br>Place and Partnership<br>4 MOAs signed: (3) LGUs and (1) DA-BFAR X<br>Policy<br>1 Policy recommendation on the management and mitigation options for the occurrence of <i>Mytilus</i> strigata in Pangul Bay  | Mindanao State University (MSU-Naawan)      | The target beneficiaries of the project are fisherfolks, local government units (municipal and provincial), peoples' organizations, industries, academe, regional offices of national government agencies (DA-BFAR and DENR), and non-government organizations operating within the jurisdiction of the study area.  | 01-Mar-23 | 28-Feb-25 | ONGOING                          | 4,966,967          | 2,206,046.20     |
| Development of a Framework for Resource Management, Mitigation of Impacts, and Guidance Towards Rational Utilization of <i>Mytilus</i> strigata in the Philippines | Project 3. Pest to Feed: The Potential Use of Invasive Mussel <i>Mytilus</i> strigata as Wet and Dry Feeds  | Integrity of the environment and climate change adaptation and mitigation | The non-indigenous mussel <i>Mytilus</i> strigata was first recorded in the country 8 years ago. To date, this species is of interest to many experts for 1) spread exponentially and affects other marine species. Research efforts are focused on the species' biological invasions, information on the biology and ecology of the species, its impacts on native species, and socio-economic impacts and possible utilization of the species. This project aims to explore the potential use of <i>Mytilus</i> strigata as feed and mineral supplement to broiler and layer chicken because aside from it being non-indigenous, information on its utilization as animal feed is very limited. The positive results of this study would also provide good inputs to the poultry feed industry since protein feed source like fish meal is primarily the most expensive feedstuff. The potential outcome of the study is to contribute to the decision support system and management plan on the possible utilization of non-indigenous mussel <i>Mytilus</i> strigata. And at the same time possibly provide a cheaper feed source for poultry and crab.  | Publication<br>1 presentation in scientific fora<br>3 published articles<br>At Least 1 IEC materials on mussel as feeds<br>Patent<br>1 potential patent on <i>Mytilus</i> strigata meal processing and utilization as animal feed<br>Product<br>Information the proximate composition of <i>Mytilus</i> strigata<br>Formulated feeds for trials<br>Mussel as dry and wet feeds<br>People and Services<br>Participation and mentoring of at least 2 undergraduate students<br>2 Trainings on the utilization of mussel ( <i>M. strigata</i> ) as feeds<br>Places and Partnership<br>Partnership with 3 LGUs<br>Partnership with 3 farmers/people's organizations<br>Partnership with DA-BFAR X supported by a memorandum of agreement.<br>Policy<br>Policy recommendation on the utilization of non-indigenous mussel species <i>M. strigata</i> as feeds                           | Mindanao State University (MSU-Naawan)      | The target beneficiaries of the projects are the following:<br><br>Broiler and mangrove crab farmers<br>Government agencies such as DA-BFAR, LGUs and other stakeholders<br>Farmers of asian green mussel, oyster, and crab- indirectly they will benefit to the positive results of this study<br>Researchers of related fields and undergraduate students  | 01-Mar-23 | 28-Feb-25 | ONGOING                          | 5,296,209          | 1,851,123.00     |
| Enhancement of Milkfish Aquaculture Productivity through Genomics (Bangus Aquaculture Enhancement through Genomics and Unified Sciences (BANGUS))                  | Project 2. Developing Genomic Resources for Improved Production Traits in Hatchery-bred Milkfish  | Integrity of the environment and climate change adaptation and mitigation | Seaflood has a fundamental role in meeting current and future food needs. In view of the overexploitation and decline of capture fisheries, aquaculture production increasingly contributes to food supply and security. An important food fish in Southeast Asia, the milkfish ( <i>Chanos chanos</i> , Family Chanidae) has centuries-long history of farming in the region. In the Philippines, milkfish production is almost exclusively sourced from aquaculture, and is the leading aquaculture species in both production volume and economic value. However, hatchery production of seedstock is considered inadequate to supply industry needs, and continued improvements in scale, efficiency, and sustainability of aquaculture are essential. One strategy to improve aquaculture production is through genetic improvement of milkfish hatchery broodstock. Growth performance is considered one of the key production traits for selection programs in aquaculture. The development of genomic resources for milkfish, and characterization of the genetic determinants for growth performance are of scientific and commercial interest and are fundamental towards the development of marker-assisted selection protocols for broodstock management, selection, and improvement. The project will employ high-throughput sequencing of the milkfish genome and transcriptome to investigate the genomic basis of growth performance, and identify putative molecular markers such as candidate gene/region and STR variants. Identification of putative markers will be essential for the development of marker-assisted selection methods and genetic improvement of milkfish broodstock to enhance milkfish aquaculture production. | 1 Profiling milkfish gene expression for growth performance through transcriptome sequencing and identification of growth-related genes/transcripts;<br>1 Identified genetic variants putatively associated with growth performance;<br>3 Discovery of putative molecular markers (genes, genetic variants) associated with growth performance for phenotype selection.  | University of the Philippines Diliman (UPD) | 1. Stakeholders in the milkfish aquaculture industry (government, private sector) may benefit from the development of molecular markers for genetic improvement of hatchery broodstock.<br>2. Local researchers (research staff, graduate students) who will be provided opportunities for further training in advanced methods for genomic analysis and bioinformatic analysis.<br>3. The research/scientific community in general as results from these studies will provide further avenues for research related to milkfish genomics, biology, aquaculture, and resources management | 01-Feb-21 | 30-Nov-24 | COMPLETED                        | 22,256,906         | 2,333,758.67     |
| Genomic Technologies for Improved Production of <i>Penaeus monodon</i>   | Project 1. Validation of genetic markers associated with body weight in the tiger shrimp <i>Penaeus monodon</i>                                     | Integrity of the environment and climate change adaptation and mitigation | This project is a sequel to a previous project implemented under the DOST-PCAARRD-funded Tiger Shrimp Genomics Program and is part of a longer-term effort that aims to capitalize on genomic technologies to enhance <i>P. monodon</i> production in the country. The previous project succeeded in generating a draft genome assembly for <i>P. monodon</i> and, in collaboration with SEA-DECAAD and UPV, in identifying candidate markers based on single nucleotide polymorphisms, or SNPs for body weight / growth. This project represents the next phase of the effort and will focus on the validation of the genetic markers through studies to be implemented in collaboration with a commercial <i>P. monodon</i> farm. This will enable the project to evaluate and confirm the performance of the markers under an environment that is representative of industry-based culture operations.  | Publication<br>1 scientific paper published in an international refereed journal<br>Patent/Intellectual Property<br>Intellectual property application on genotypic markers for <i>P. monodon</i> body weight<br>Product<br>A set of genotypic markers for <i>P. monodon</i> body weight<br>People Service<br>Training of 1 MS student<br>Place and Partnership<br>Partnership with 1 <i>P. monodon</i> farm operator   | University of the Philippines Diliman (UPD) | The direct target beneficiaries of the project are <i>P. monodon</i> farm operators who will be enabled by the genotyping technology to increase their production through selection and use of genetically higher-quality broodstock. The whole <i>P. monodon</i> -based industry (fisheries, aquaculture, processing, export) also stands to benefit from the increased production of the farms.  | 16-Sep-23 | 15-Sep-25 | ONGOING                          | 8,440,919          | 1,228,934.00     |

| 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, 2024 | Total Project Cost | 2024 PCAARRD GIA |
|---|---|---|--|---|---|---|-----------|-----------|---------------------------------|--------------------|------------------|
| Genomic Technologies for Improved Production of Penaeus monodon   | Project 2. Targeting Essential Genes Utilizing RNA Interference to Mitigate WSSV in Tiger Shrimp  | Integrity of the environment and climate change adaptation and mitigation | Shrimp production has been one of the major contributors to the country's economy and an essential source of food. In the effort of controlling White Spot Syndrome Virus (WSSV) in shrimp, the study aims to gain a deeper understanding of host-virus interactions, targeting genes that may play a role in the infectivity or pathogenicity of WSSV. This project will focus on available information in the published database (e.g., GenBank), in published reports, and in previous studies such as the recently concluded Tiger Genomics Program. This study will explore on the previous results of the earlier projects the researchers have implemented. Specifically, in Project 1, Mass production of dsRNA to mitigate WSSV infection in shrimp) where a VP9, a viral non-structural gene was identified to have therapeutic potential against WSSV infection. Project 2 (Application of genomics in the development of genome-wide markers related to production traits in Penaeus monodon) has initially identified marker genes for WSSV resistance. These previous data/processes can be utilized as a springboard in identifying genes for this project. In addition, this project will innovate and develop existing methodologies for local applications to control and/or neutralize WSSV such as the in vivo and in vitro utilization of RNA interference (RNAi).  | Publication<br>2 publications in an international-refereed journal<br>1 IEC material<br>Place and partnership<br>MOA with MSU-IT<br>People and Services<br>3 Undergraduate and 2 Graduate students supported<br>Product/Process<br>Low-cost dsRNA production system   | University of Santo Tomas (UST)                                 | Shrimp farmers, Biotech Laboratories, Aquaculture industry, Research students, Academe  | 16-Sep-23 | 15-Sep-25 | ONGOING                         | 8,475,864          | 2,142,044.00     |
| MECO-TECO   | Role of Type VI Secretion System during Shrimp Infection of Vibrio spp. -causing Acute Hepatopancreatic Necrosis Disease (AHPND)                  | Integrity of the environment and climate change adaptation and mitigation | This project will investigate the potential role of Type VI Secretion System encoded by Vibrio-causing AHPND during shrimp infection. It has been shown that AHPND is caused by plasmid-encoded binary toxins V. parahaemolyticus Photorhabdus insect-related toxins (PvAV and PvIBV). However, little is known about the pathogenicity and it remains unknown whether other virulent factors are present that might play important roles during shrimp infection. Interestingly, comparative genome sequence analysis revealed that Type VI Secretion System (T6SS) is the differentiating factor between AHPND-causing V. parahaemolyticus strains (AHPND/V) and non-AHPND strains. Only AHPND/V strains encode T6SS, the V. parahaemolyticus not causing AHPND does not have T6SS. T6SS is a nanomachine used by gram-negative bacteria to inject the growth and kill by injecting toxins into target bacteria or eukaryotic cells. To date, all of the studies on the disease-causing mechanism is on V. parahaemolyticus. Recently however, other AHPND-causing Vibrio spp. were identified from affected shrimp populations, such as V. Harvey (Kondo et al., 2015), V. orientalis (Lu et al., 2018), V. campbelli (Dong et al., 2017) and V. parahaemolyticus (Restrepo et al., 2018). There is very limited AHPND-related information available for these strains. This study aims to extend our understanding on how Vibrio spp. causing AHPND colonize and thrive in the shrimp.   | Publication<br>2 publications<br>1 Indexed Conference presentation<br>People and Services<br>Trained staff<br>NFRDI<br>1 Science Research Specialist<br>1 Project Staff<br>1 undergraduate/ graduate students (OJT internship/ thesis advisee)<br>Places and partnership<br>MOA with Academia Sinica<br>Dr. En-Min Lu<br>Dr. Chih-Hong Kuo<br>MOA with UP Diliman PGC Core Facility for Bioinformatics<br>SEA/DEC Aquaculture Department  | National Fisheries Research and Development Institute (DANFRDI) | P. vanarnaei and P. monodon farms/growers, Aquatic animal health researchers, TSS scientists/research community, NFRDI technical staff  | 01-Jan-22 | 30-Sep-25 | ONGOING                         | 9,675,131          | 2,525,549.89     |
| Nursery of Eel Enhancement and Development Program  | Glass Eel Early Weaning and Nursery Grow-Out Operations   | Integrity of the environment and climate change adaptation and mitigation | The project will conduct research on early weaning and nursery rearing grow-out operation to develop protocol and policy recommendation on stock enhancement through aquaculture. This effort ensures sustainability and increase in production that would help the industry in moving forward.  | Publication:<br>Effect of different salinity and stocking density in pre-nursery rearing of glass eel<br>Patent: Protocols on green water technology<br>Protocols on cyclic feeding scheme for glass eel during early weaning and nursery rearing stage<br>Product: Protocols on eel Pre-Nursery and Nursery Rearing<br>People: Symposium, Training/Seminar-workshop on eel Pre-Nursery and Nursery Rearing, 2 undergraduate student<br>Place: Local Government Unit, Small Scale Private Farm, Bureau of Fisheries and Aquatic Resources 01 (BFAR RO), LUPV, ESPC<br>Policy: Policy Brief on Eel Stock Enhancement Through Aquaculture   | Mariano Marcos State University (MMSU)                          | Glass eel gatherers, glass eel traders, eel growers, extension workers and researchers, policy makers/legislators   | 01-Jan-22 | 30-Nov-24 | COMPLETED                       | 9,453,394          | 1,339,637.65     |
| Assessment of the Production Performance and Profitability of Raising Itapinang (IP-Kayumanggi) at Bureau of Corrections (BuCor), Muntinlupa City | Assessment of the Production Performance and Profitability of Raising Itapinang (IP-Kayumanggi) at Bureau of Corrections (BuCor), Muntinlupa City | Integrity of the environment and climate change adaptation and mitigation | Itapinang (IP) is a new breed of Philippine native duck developed in 2017. Two parental lines (IP-Itim and IP-Kahak) and one commercial hybrid line (IP-Kayumanggi) were developed through years of breeding and selection through research funded by DOST-PCAARRD. This new breed of layer type ducks is genetically superior to the traditional "Pinarang" ducks. It can lay 200 eggs, IP-Kayumanggi now produces 260 eggs per duck per year, 80% of which weigh 55g or more, which is the minimum requirement for ballul production. Assessment of the production performance of the Itapinang now will be done in small scale under BuCor that will be funded by DOST-PCAARRD.   | Publication: At least 1, copyrighted IEC materials/promotional materials<br>Patent: N/A<br>Product: Performance Data of IP-Kayumanggi, established farm and BuCor Muntinlupa. No. of ballul and sated eggs sold/People: Technical guidance and training provided to<br>4 BuCor Personnel<br>... 100 PDL trained on IP-Kayumanggi management and egg processing<br>Place: BuCor and Manila State University  | DOST Region VI  | LGUs, PDLs, researchers, students, IP raisers, Native duck industry, ballul and sated eggs vendors  | 01-Jul-23 | 30-Jun-25 | ONGOING                         | 5,900,000          | 1,008,267.20     |
| Creating Stable Supply of Duck and Duck Eggs in Camarines Sur Through Itapinang Production  | Creating Stable Supply of Duck and Duck Eggs in Camarines Sur Through Itapinang Production  | Rapid, inclusive and sustained economic growth                            | Itapinang is one of the superior breeder ducks developed through intensive selection and breeding using Philippine mallard duck or Patinos duck as parent stocks. It is a type of breed where the production performance potential exceeds the performance level of its parent reaching up to 70% egg production rate (Medenita, 2022). In the Bicol region specifically in Camarines Sur, duck raising was popular among backyard raisers for the production of sated and embryonated eggs. However, this sector often suffers from low productivity, high mortality and limited profitability due to lack of access to key inputs such as trainings, quality breeder stocks and affordable feeds and biologicals. Preliminary studies conducted in PNH, Camarines Sur, Ampong, et. al (2019) identified one major supplier of ducklings which is "Noly's". Balul, who also practices traditional method of incubation. In terms of duck egg production, 27,000 eggs per month were reported by the raisers in two barangays under study. The gaps identified Balul production was also done at the same processor that produces about 32,000 balul per month. The increase in number of balul produced is due from the fact that raisers from other barangays also sell their eggs to the Balul maker in exchange of their fresh duck eggs. The prevailing price of duck eggs as of August 2023 is at 10.00-141.00 per piece while balul sells at 425.00 per piece and sated eggs at 415.00 per piece. On the other hand, ready-to-ly mallard ducks are sold at 430.00 - 450.00 per head while day-old ducklings are sold at 445.00 - 450.00 per head. With the aforementioned figures and data, there is a clear indication that the duck and duck egg production is very much unfulfilled and of low quality due to the low productivity of the raisers and unreliable practices of processors. Moreover, there is still a prevailing travel restrictions and temporary banning of duck dispersal due to avian influenza outbreak according to Department of Agriculture. With this, local raisers find it hard to transport or ship breeder stocks from other provinces resulting to high prices of inputs and difficulty finding stock replacements by developing Itapinang breeding and hatchery management system, plant-based feed resources, and antibiotic alternatives. This program will try to ensure food safety and stable supply of duck eggs and breeder stocks. Likewise, optimal performance of Itapinang can be achieved by providing them the ideal factors such as nutrition, housing, health and feeding management among others. This will result | Publication: 64 IEC materials (brochures, flyers, techno guides and other marketing paraphernalia) using local dialects<br>64 Business model/plan<br>64 Scientific publication to accredited journal<br>64 Research presentation/ 64 Audio visual presentation<br>Patent: 64 Technical improvement to management systems of Itapinang in the region<br>Product: 64 Itapinang breeder multiplier farms<br>10,000 male and female IP-Kayumanggi produced in the CBSUA and partner multiplier farm/egg produced by CBSUA and partner farm producers<br>People: 50 farmers trained in IP-Kayumanggi production<br>64 Technology adopters to sustain the production/ 15 capacitated single parents and PWOMs in duck farming<br>Place: 64 MOA with PCAARRD regarding implementation of the project<br>64 MOU with other schools, government institutions, associations, and private farmers/ 64 MOU with Learning Sites for Agriculture/Policy: 64 Promotion of locally produced Itapinang pure and IP-Kayumanggi<br>Sustainability of duck industry in the Bicol region/ 64 Promotion of duck meat as alternative to chicken<br>64 Local legislative passed resolution on the use of IP breeds by raisers | Central Bicol State University of Agriculture (CBSUA)           | Existing layer duck farmers/ Learning Sites for Agriculture/ Potential duck farmers/ Local government units/ Balul and sated egg vendors/ Balul and sated egg processors/ Consumers of duck eggs and (culled or male) duck meat/ Agriculture Technicians, researchers, teachers and students in layer duck breeding, production, and marketing  | 01-Jan-24 | 31-May-26 | ONGOING                         | 4,992,895          | 2,676,447.40     |
| Development of an Efficient Hog Distribution and Marketing Model for an Improved Disease Management in Luzon, Philippines                         | Development of an Efficient Hog Distribution and Marketing Model for an Improved Disease Management in Luzon, Philippines                         | Rapid, inclusive and sustained economic growth                            | In the Philippines, the hog industry remains to be a major contributor to the livestock sub-sector. As of July 1, 2023, total hog inventory of the Philippines was estimated at 10,070 heads. In 2022, Luzon was the major source of hogs, producing 37% of the total production, followed by Mindanao (16%) and Visayas (28%). Top provinces in Luzon include Batangas with 8% of the total production, followed by Palawan (1%) and Pangasinan (2%). As the population grows and the demand for pork and other pig products increased, the swine industry experienced intensification and globalization enabling a notable increase in the movement of animals and their products. This raised both the risk and rate of disease transmission within the country and among different nations. The current network of hog movement as well as supply distribution and marketing models should be characterized in order to adapt to these changes in the hog industry and economy. The proposed study aims to analyze the contribution of pork movement to local disease transmission and assess the interplay of various key players to identify efficiencies in the supply chain in terms of marketing and distribution. Although the findings will offer a valuable insight for the development of strategies for disease surveillance and control, an efficient hog marketing and distribution models that are resistant to various price shocks.   | Publication: 1 article submitted for publication in scientific journal<br>Patent: N/A<br>Product: Model for distribution and marketing of hog/People: Consumers will have traceability of their pork and its by-product/Place: Private-Public Partnership (government, hog producers, accredited slaughterhouses, local government of Batangas and private investors). The government will fund the establishment of the facility to be operated by the private sector to ensure sustainability. Research linkages established with hog industry stakeholders/Policy: Policy Recommendations to support: 1) implementation of improved live hog marketing and distribution system (establishment of designated roads/highways for transport of live hogs) and 2) establishment of integrated facility for slaughtering, meat cutting and cold storage of pork.  | Bureau of Animal Industry (DA-BAI)                              | Farmers- There will be a ready market for the hogs produced by the commercial farmers and there is no need to transport the hogs to the neighboring provinces. This will save logistic cost, transport loss, and incidental expenses, among others thus, profit.<br>Consumers- Improved efficiency of distribution and marketing of pork thus, fair price for consumers. Also, consumers can be assured of quality pork because of a better traceability system.<br>Batangas LGU- After the assessment of the disease management system of Batangas, policy recommendations to address the gaps and weaknesses in the system will be formulated. Perhaps, there will be policy recommendations that can be applicable at the national level that would help minimize the risk of spreading the disease. A | 01-May-24 | 31-Oct-25 | ONGOING                         | 4,159,410          | 3,219,440.00     |
| Development of Antibodies Against African Swine Fever Virus Intended for Feed Fortification to Prevent Farm-To-Farm Transmission                  | Development of Antibodies Against African Swine Fever Virus Intended for Feed Fortification to Prevent Farm-To-Farm Transmission                  | Rapid, inclusive and sustained economic growth                            | African Swine Fever (ASF) is a viral hemorrhagic disease of swine that currently poses a serious threat to global food security and livelihoods in many regions. In the Philippines, ASF was first detected in the death of more than 3 million heads of hogs due to the virus. Despite various preventive actions, there is an absence of any drug or vaccine to ASF anywhere in the world indicating that ASF will be here for the long haul. This proposal addresses the ASF problem head-on by targeting the virus itself to keep it from being transmitted by designing an antibody product that will bind to and neutralize the ASF virus inside the gut to block its entry into the systemic circulation and prevent colonization/infection by the virus.   | The project aims to deliver the following output: 10 project members trained for BSL2 protocol; 2 samples collected from infected hogs; 3 viral material isolated and inoculated onto cell lines; 4. Verified ASF virus; 5. Isolation pens established; 6. Successful inoculation of chicken; 7. Anti-ASF antibodies have been quantified from poultry.   | De La Salle University (DSU)                                    | Swine Farmers, Feed manufacturers, Research community, Researchers and graduate students.   | 01-Jan-23 | 31-Dec-24 | ONGOING                         | 21,828,595         | 4,179,673.86     |
| Development of Forage-Targeted Starter Culture for Ensilaging Forage Feeds for Native Chickens and Ducks  | Development of Forage-Targeted Starter Culture for Ensilaging Forage Feeds for Native Chickens and Ducks  | Integrity of the environment and climate change adaptation and mitigation | The availability of low-cost feed ingredients is one of the problems faced by native chickens and duck raisers in the country affecting farm production efficiency and profitability. Many of poultry species raisers depend mainly on commercially available feed and/or ingredients and if not, will leave their birds to browse their food to the pasture with no or minimal care, resulting to lower productivity through inconsistent product quality. Although, there are some raisers that started to utilize locally abundant feedstuffs, forages, farm biomass and kitchen waste (to minimize feed cost). However, because of lower digestibility of these feedstuffs due to higher crude fiber and presence of antinutritional factors (ANF), its utilization is not fully maximized. This problem on lower digestibility due to higher crude fiber and presence of ANF can be mitigated through fermentation. Fermentation of forages improved its nutritive value and degrades antinutritional factors present in the plant material, leading to an improved availability of proteins and other nutrients. However, change in quality is inconsistent as no changes were observed on fermentation. Addition of inoculants can improve the fermentation, but efficiency of fermentation of inoculated forages is largely dependent on the interactions of the microbial species in the inoculant with specific microbial populations and chemical components within the forage and therefore consistency of fermentation product/usage can only be attained if a forage-targeted-starter culture will be developed. The developed starter culture can be used to establish an improved fermentation protocol for easier and consistent fermentation products, resulting to increase utilization of forages and other locally abundant feedstuff for zampen native chicken and Itapinang and its adoption by farmers will be increased because it is very easy to use.   | Publication: 1. IEC materials for improved fermentation protocol<br>2. Substrate specific starter culture for improved fermentation.<br>3. Nutritional composition of Fermented Forage<br>4. Nutritional Composition of Formulated feeds mixed with fermented forages<br>Patent: 1. Starter Culture<br>2. Utility Model for improved fermentation protocol utilizing starter culture<br>3. Formulated feeds mixed with fermented forages<br>Product: 1. Starter culture<br>2. Improved existing protocol utilizing developed starter culture<br>People: 15 farmers/ 15 feed processors/ 15 farmer adoptors<br>MOA to Farmer Adoptors<br>80 Students<br>15 Farmer/Place: 1 MOA to UPLB<br>MOA to Farmer Adoptors<br>Policy: Starter culture developed to specific forages may be a policy recommendation to the developed. The developed starter culture can be used to establish an improved fermentation protocol for easier and consistent fermentation products, resulting to increase utilization of forages and other these forages for sustainability of the technology.  | Western Mindanao State University (WMSU)                        | Local farmers engaged in aquaculture farming LGUs and cooperatives Feed manufacturers and compounders Food industry Academe   | 01-Apr-23 | 31-Mar-26 | ONGOING                         | 4,999,745          | 910,960.60       |

| 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, 2024 | Total Project Cost | 2024 PCAARRD GIA |
|---------------|--|---|--|--|--|--|-----------|-----------|---------------------------------|--------------------|------------------|
|               | Development of Philippine Signature Muscovy Duck Breed   | Integrity of the environment and climate change adaptation and mitigation | A breeding and selection project geared towards the development of Philippine signature Muscovy duck breed that will support sustainability of quality breeder stocks leading to availability of duck meat supply in support to scarcity of pork brought about by ASF. This project also promotes livelihood to smallholder farmers thru Muscovy duck meat production and other potential duck meat specialty products.  | At the end of four years, the project is expected to deliver the following:<br><ul style="list-style-type: none"> <li>-2,000 stable breeding true-to-type Philippine Muscovy ducks with predictable production performance and consistent product quality (Y2 and Y3).</li> <li>-Quality breeder duck production and distribution systems developed (Y3 and Y4)</li> <li>-At least 2 private breeder farms engaged in breeder Muscovy duck production (Y4)</li> <li>-Nutrient composition and sensory characteristics of Muscovy duck meat (Y4)</li> </ul>   | Iligao State University (IFSU), Bureau of Animal Industry (DA-BAI)   | —Iligao and Quezon local farmers<br>—Day-old duckling, slaughter and ready to lay pullet producers<br>—Researchers   | 01-Jan-22 | 31-Dec-25 | ONGOING                         | 19,707,422         | 2,199,100.00     |
|               | Development of Sustainable breeding and production systems for Paraoakan native chicken in Palawan   | Integrity of the environment and climate change adaptation and mitigation | Paraoakan, the known genetic group of native chicken in Palawan has varying phenotypic characteristics and production performance within its group as perceived by paraoakan raiseers. A sustainable breeding and selection R&D program for paraoakan native chicken can intensify the improvement of the native chicken industry.   | Information on the productive and reproductive performance of breeding true-to-type Paraoakan native chicken;<br>Information on appropriate production and management practices for Paraoakan native chicken;<br>Paraoakan breeding and selection, and hatchery technology;<br>> 5,000 head breeder Paraoakan native chickens;<br>> 20,000 head quality Paraoakan hardened chicks<br>> Two (2) private entrepreneurs identified as multiplier farms;<br>> Two (2) scientific articles published in refereed journal.<br>Publication: A peer-reviewed journal article and conference proceedings paper detailing the design, development, and validation of the non-invasive duck egg sexing device Patent: An IP application for the non-invasive duck egg sexing device Product: A fully functional non-invasive duck egg sexing device prototype People: Not Applicable Place: Establishing partnerships with hatcheries and breeders to pilot test the device Policy: Not Applicable.   | Western Philippines University (WPU), Palawan State University (PSU) | Native chicken raisers in the province and in the region, faculty, students, NGOs, cooperatives, and other institutions who wish to engage in native chicken production, native chicken domestic and institutional consumers   | 01-Aug-21 | 31-Oct-24 | COMPLETED                       | 8,478,601          | 952,996.10       |
|               | EGGIOTYPE: Non-invasive in-egg sex identification of ItikPNAS Eggs   | Rapid, inclusive and sustained economic growth                            | This proposal aims to develop a non-invasive duck egg sexing device using spectroscopy technology specifically for ItikPNAS Kayumanggi (IP-Kayumanggi) duck eggs. Traditional methods of sexing duck embryos in the Philippines are invasive to the embryo and prone to errors. The proposed device will offer a faster, more accurate, and non-invasive approach to sexing duck embryos, leading to enhanced productivity, minimized economic losses, and increased profitability for duck breeders and hatcheries. The project objectives include conducting a comprehensive literature review on spectroscopy, designing and developing a prototype device, optimizing device parameters, validating its accuracy, evaluating its economic viability, and assessing potential industry impact. The findings will be disseminated through publications and presentations. This proposed project holds immense potential to revolutionize the industry by providing a more efficient and cost-effective method of sexing duck embryos, thereby boosting productivity and reducing economic losses, while also contributing to the advancement of spectroscopy in animal breeding. The product will employ a mixed-methods approach, incorporating qualitative and quantitative research methods. The project team comprises experts in animal breeding, imaging technology, and agricultural economics, ensuring successful completion within an estimated timeframe of 18 months. Anticipated outcomes include the development of a fully functional non-invasive duck egg sexing device, scientific publications and presentations, as well as potential patents or intellectual property. These outcomes are expected to yield improved productivity, reduced economic losses, increased profitability, and significant contributions to the advancement of spectroscopy in animal breeding.   | Publication: A peer-reviewed journal article and conference proceedings paper detailing the design, development, and validation of the non-invasive duck egg sexing device Patent: An IP application for the non-invasive duck egg sexing device Product: A fully functional non-invasive duck egg sexing device prototype People: Not Applicable Place: Establishing partnerships with hatcheries and breeders to pilot test the device Policy: Not Applicable.   | Technological Institute of the Philippines (TIP)                     | The target beneficiaries are the following:<br>1. Breeders and commercial farmers involved in the production of Itik PNAS Kayumanggi ducks.<br>2. Researchers and scientists involved in the development of animal welfare and sustainable agriculture practices<br>3. Government agencies responsible for the regulation of animal welfare and sustainable agriculture practices. | 01-Jun-24 | 30-Nov-25 | ONGOING                         | 5,000,000          | 3,652,284.00     |
|               | Enhancing the Feed Supply System for Dairy in Negros Oriental through Corn Silage Production   | Rapid, inclusive and sustained economic growth                            | This project will have four (4) different component studies, namely: Economic viability of growing open-pollinated and hybrid varieties of corn for silage production, growth and milk production performance of dairy cattle and goat breeds fed with corn silage, and genetic diversity of native pig breeds and feeding of corn silage and promotion of corn silage as a business venture and as a component of the feed supply system for dairy in Negros Oriental.  | NonProduct: Minimum of two publications upon the termination of the projectPatent: NoneProduct: Maize SilagePeople: Extension works promoting silage production to local farmers (50 dairy and dairy cattle and goat farmers) A Place: Selected municipalities in Negros Oriental MOU with participating agencies and LGU/Policy: A policy incorporating maize silage in the feed production and distribution in Negros Oriental   | DOST Region VII  | Maize and dairy cattle and goat farmers in Negros Oriental   | 01-Jul-23 | 30-Jun-25 | ONGOING                         | 4,915,314          | 3,575,575.00     |
|               | Enhancing the Genotypic and Phenotypic Characteristics of Markaduke Native Pig Through Close Nucleus Breeding System                             | Rapid, inclusive and sustained economic growth                            | The project titled "Enhancing the Genotypic and Phenotypic Characteristics of Markaduke Native Pig Through Close Nucleus Breeding System" aims to significantly enhance the current herd of Markaduke Native Pig at Marinduque State University, which could lead to breakthroughs in pig breeding and genetic research. The Markaduke native pig is genetically valuable, with traits that contribute to growth, profitability, and meat quality. However, its population is declining due to inbreeding, loss of genetic diversity, and marbling, are currently present at low frequencies. To address this, the project will implement a close nucleus breeding system, using assortative mating to increase the frequency of these important genes. The stocks from the current herd identified to possess these valuable genes will serve as the foundation lines for breeding. Future lines will undergo genetic and phenotypic evaluations to develop a line with predictable outcomes. Through rigorous selection and health management and improved Markaduke native pig herd with enhanced traits to support the local pork industry, boost income opportunities, and ensure a reliable supply of high-quality native pigs for techon production and other pork products.  | Publication: &nbsp;One scientific paper and/or ECPatent: &nbsp;Technology on production of greenProduct: 100 gilts and 20 junior boars (top 25%) produced; 400-500 farrow pigs producedMarket: &nbsp;People: 60 Farmer-cooperators trained for Markaduke native pig production management and artificial insemination; 20 Undergraduate/MS Students engaged in the project activities; 5 industry actors and/or playersPlace: 5 MOU between MarSU and LGU; 1 MOU between MarSU and the project, the project will implement a close nucleus breeding system, using assortative mating to increase the frequency of these important genes. The stocks from the current herd identified to possess these valuable genes will serve as the foundation lines for breeding. Future lines will undergo genetic and phenotypic evaluations to develop a line with predictable outcomes. Through rigorous selection and health management and improved Markaduke native pig herd with enhanced traits to support the local pork industry, boost income opportunities, and ensure a reliable supply of high-quality native pigs for techon production and other pork products. | Marinduque State University (MarSU)                                  | Industry actors and players such traders, and processors Farmer-cooperators Would-be industry actors and players (Interested partners) Academe: Researchers and students Consumers   | 01-Oct-24 | 30-Sep-26 | ONGOING                         | 5,000,000          | 3,250,992.00     |
|               | Enhancing the Production and Profitable Utilization of ISUbeItik Native Pig  | Rapid, inclusive and sustained economic growth                            | This proposal aims to re-establish the population of ISUbeItik Native Pigs at ISU to ensure a sustainable and profitable production system. The ISUbeItik Native Pig Research and Development Station is expected to provide superior breeding stocks for local native pig breeders, to improve the productivity of native pig farms, and to ensure the availability and feeding of the steady supply of native pigs for techon with uniform product quality will allow the native pig farmers to demand higher prices for their products. Sustainable native pig production through the application of technologies in feeding, organized breeding and selection, production and health management are essential to achieve higher productivity and production efficiency. The proposed project is expected to create sustainable livelihoods in rural farming communities and augment supply upon conservation by profitable utilization of ISUbeItik Native Pig.  | Publication: At least 2 research papers submitted for publication in a scientific journal or conference proceeding. IEC materials on ISUbeItik Native Pig production will also be developed Product: 50 Breeder Pigs and 300 Lechon PigsPeople Services: 3-5 local native pig entrepreneurs in ISUbeItik native pig production; at least 5 undergraduate students (DVM Animal Husbandry Animal Science) and at least 3 graduate students, who will conduct their thesis on ISUbeItik native pigPlaces and Partnerships: At least 2 LGU or local cooperative engaged in the project or 3-5 farmer entrepreneur engaged in ISUbeItik native pig production Policy: At least 1 science-based policy recommendation to support and sustain ISUbeItik native pig production.  | Isabela State University (ISU)                                       | 1. ISU researchers and students2. Local entrepreneurs engaged in native pig production3. Native pig traders4. Native pig product processors5. Municipalities/ Breeding LGUs  | 01-Oct-24 | 30-Sep-27 | ONGOING                         | 5,000,000          | 2,375,991.00     |
|               | Enhancing the Productivity and Sustainability of Benguet Native Pig Production   | Rapid, inclusive and sustained economic growth                            | This project aims to promote the production of native pigs in the province by providing a sustainable source of stocks with improved and consistent performance. This will encourage more farmers to engage in native pig production, while contributing to sustainable supply of pork in the province and the country as well.  | Publication: 1. One (1) techno-guide on Benguet native pig productionPatent: 1. One (1) trademark registration of Benguet native pig 2. Feeding guide for Benguet native pigsProduct: 1. Forty (40) Benguet native pig breeder animals 2. One (1) nucleus herd established at BSU 3. Developed breeding system and mating plan for the improvement of Benguet Native Pig 4. Techno-guide on improved native pig production system in BenguetPeople: 1. Technical guidance and training provided to the following: 60 farmers trained 65 LGU extension workers 5 technical project personnel trained on breeding and selection of pigs Place: 1. At least two (2) MOA forged with farmer cooperators and M/G/LGU/ PLGU in BenguetPolicy: 1. Consolidated results of research conducted as result to policy on local genetic resource conservation, improvement and profitable utilization of Benguet native pigs  | Benguet State University (BSU)                                       | Researchers, professors, students, and swine breeding practitioners Native pig farmers Native pig consumers Institutional markets  | 01-Jul-24 | 30-Jun-27 | ONGOING                         | 5,000,000          | 1,532,680.00     |
|               | Establishment of a breeding population of Markaduke Native Pig in the Province of Romblon as a strategy to widen its production and distribution | Rapid, inclusive and sustained economic growth                            | The adoption of Markaduke from MSC to the province of Romblon could have a significant effect on the development of the economy of the province and can contribute as well as a source of income for swine raisers. The proximity of Boracay, the number one tourist destination in the country is seen as a potential market for native pig. The demand for native pig techon is very high. Moreover, the establishment of breeding population of Markaduke native pig in Romblon is deemed necessary to preserve its breed for further propagation and distribution in the country in case the population of Markaduke in Marinduque will be affected by ASF or any other pest and diseases. It is in this context that this proposal is conceptualized and also in line with the current initiatives of the Swine ISP of DOST-PCAARRD   | Publication: Publications A. Es: Journal article A. Es: Annual Reports A. Es: Terminal Report A. Es: Promotional slides A. Es: IEC materials (brochure and A pamphlet)Patent: Patents/IP A. Es: Copyrighted Brochures and/or Pamphlets A. Es: Patent (LHM)Product: Products Breeding farm Forage area Piglet People: People Services - Capability and skills training programs - Number of native pig growers trained - Technical assistance to possible adopters of the new technologyPlace: Places and Partnerships MOA/MOU signed: One each for MSC and NSPRDC-BAI MOA/MOU signed: One for each of the organized native pig growers A. Policy: Policy A. Es: Provincial ordinance on the utilization of Markaduke NP piglet in hog raising A. Es: Drafted policy for LGU to A provide support services to NP piglet growers   | Romblon State University (RSU)                                       | Native pig growers Farmers Community organization Out-of-school youth Entrepreneurs Policy makers Women association, cooperatives, etc. LGUs, OFWs, 4Ps, TUPAD Single mother/single father Faculty/students researcher   | 01-May-24 | 30-Apr-27 | ONGOING                         | 4,999,380          | 1,904,460.00     |
|               | Establishment of an Economically Viable and Sustainable ItikPNAS Breeder Farm in Mabini, Davao de Oro  | Rapid, inclusive and sustained economic growth                            | The ItikPNAS duck industry is a multibillion enterprise with a wide range of stakeholders. In Davao Region, the value of production for duck eggs and meat amounted to 319 million pesos, and the volume of production was estimated at 1,633 thousand MT for duck eggs and 1,233 thousand MT for duck meat in 2022 (PSA, 2023). The continued survival and growth of the industry depend on efficiency in the production and marketing systems relative to competitors from overseas as well as from other products (Chang and Dagaas, 2004). ItikPNAS (IP) is a genetically superior breed developed through the initiative of DOST-PCAARRD in 2016 implemented by the Bureau of Animal Industry-National Swine and Poultry Research and Development Center (BAI-NSPRDC) in Tausog, Quezon (Julian et al., 2022). IP ducks outperform Pateros ducks in terms of higher egg production (200 vs. 200 eggs/double/year), egg quality in terms of weight which 80% of eggs weigh 60 g or more, predictable egg production performance, and body weight uniformity (DOST-PCAARRD, 2017). Previous studies found that the egg production performance of IP was 176% (Bentale et al., 2016), 187% (Bentale et al., 2020), and 70.30% (Santiago et al., 2022). IP lim and IP Khaki are two pure lines that have been developed over six to eight generations of line breeding and selection (Santiago et al., 2022). IP Kayumanggi is a commercial hybrid produced in the country by selected multiplier farms both government and private (Santiago et al., 2022). ItikPNAS Multiplier Farms in Davao Region include: a) Subasta Farm, Caltan, Davao City; b) Banaybanay Multiplier Farm, Banaybanay, Davao Oriental; c) SPWASMT Multiplier Farm, Digos, Davao del Sur, and d) Department of Agrarian Field Office (DARFO), X, Tubok, Davao City. One challenge these multiplier farms face is securing quality breeder stocks, i.e., day-old ducklings or ready-to-lay pullets. Reputable stocks are typically obtained from Luzon, and due to the rising cases of avian influenza, poultry movement is restricted within the country, affecting the sustainability of production and resulting in higher production costs among growers. Furthermore, due to a lack of high-quality genetic materials, multiplier farm operators tend to practice indiscriminate breeding/mating to maximize the utilization of the available stocks. This breeding practice may result in a loss of genetic variability, an increased risk of genetic defects, reduced population fitness, and decreased flock productivity.&nbsp; | Publication: 1 publication on the technical and economic feasibility of an ItikPNAS Breeder FarmPatent: 1 patent for IP duck egg smart incubatorProduct: 1 IP duck egg smart incubatorPeople: 1 training conductedPlace: 1 institutional partnerPolicy: None   | University of Southeastern Philippines (USEP)                        | Duck industry stakeholdersIP Multiplier Farms in Davao regionAcademeResearchersStudents  | 01-Jul-24 | 30-Jun-26 | ONGOING                         | 5,000,000          | 2,654,872.50     |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---------------|---|---|---|---|---|--|-----------|-----------|----------------------------------|--------------------|------------------|
|               | Establishment of the Batanes Native Pig Breeding Herd   | Integrity of the environment and climate change adaptation and mitigation | To boost the native pig production in Batanes, the Batanes State College through its agriculture department, intends to implement an R&D project to develop breeding true-to-type populations of Batanes native pigs. This is to realize the potentials of the native pig in contributing to the country's attainment of food security, agricultural growth, and in providing livelihood opportunity not only for the Iatan people but for the Filipino in general.   | Publication: At least two papers on the production system of native pigs in Batanes, phenotypic characteristics and genetic diversity of Batanes native pigs<br>Production guide on Batanes native pig raising<br>Breeding goal and selection criteria for Batanes native pig<br>Patent: NA<br>Product: Batanes native pig breeder animals<br>People: Farmers, Agriculture Department, and partner agencies will receive technical knowledge and training<br>Place: Partnership with LGUs in Batanes Province<br>Policy: Policy on breeding and conserving the unique genetics of native pigs in Batanes  | Batanes State College (BSC)   | Researchers, professors, students, and swine breeding practitioners<br>Native pig farmers<br>Native pig consumers<br>Institutional markets   | 01-Sep-22 | 31-Aug-25 | ONGOING                          | 5,000,000          | 963,386.90       |
|               | Genetic structure analysis and development of genetic screening protocols for traceability of Philippine Native Pig populations   | Integrity of the environment and climate change adaptation and mitigation | Several native pig R&RD stations have established and purified breeding herds of native pigs sourced from different locations/regions, e.g. O. Black from Davao, Marabula from Marabou, Sinangan from eastern Samar, ISUbeha from Isabela, Yookah from Kaligang and the Benguet native pig. Unfortunately, the African Swine Fever (ASF) outbreak diminished the number of breeder animals in native pig R&RD stations. Reproduction is being done with animals coming from multiple farms and communities where the native pigs originate. Identifying and selecting animals from communities or multiple farms to reconstitute the established/purified herds of native pig R&RD stations would be facilitated with a set of DNA markers to determine their genetic profile. Furthermore, having a specific genetic profile for each of the established native pig genetic groups would prevent commercial farms misrepresenting their animals to be belonging to one of the established genetic groups that the various R&RD stations worked so hard to develop. This research project will look into the genetic diversity of the native pig population and identify a set of DNA markers for use in breed identification, breed composition and parentage testing, which are essential in establishing animal traceability and Breed Registry in both native pigs and commercial pigs.   | Publication: At least one (1) publication in scientific journal; At least two (2) poster presentations from scientific conference; At least one (1) IP filing on UI/Patent on genetic screening protocol/Product; At least one (1) Percentage testing protocol established suitable for native and/or commercial pig; At least one (1) protocol on determining breed purity established suitable for native commercial pig; At least one (1) protocol on genetic profiling or breed ID of various breed/genetic group/People; Training of SGARS staff on next genetic testing protocol for parentage and genetic profiling or breed identification/Place: Genetic testing protocol and parentage testing service to be made available by PCC molecular genetics laboratory and SGARS, in participating technology/Policy: Recommended policies on the use of DNA verification in setting up of breed registry   | Philippine Carabao Center (PCC)   | Various native pig R&D stations, Cooperatives and farmer's association, individual households raising native pigs, including women, a group of multiplier farms and commercial native pig raisers  | 01-Jul-23 | 30-Jun-26 | ONGOING                          | 19,179,054         | 4,272,391.30     |
|               | Improvement of forage species for high yield, improved quality, persistence to cutting, and drought tolerance towards a sustainable dairy production  | Rapid, inclusive and sustained economic growth                            | Revitalizing animal nutrition and productivity in the backyard/smaller dairy farms through forage gene bank enhancement using farmer's™ forage-of-choice, selection of elite accessions through agro-morphological characterization, biochemical and nutrient profiling. Finally, will conduct an initial hybridization of the promising fodder accessions equipped with high yield and good nutritional properties.  | Publication: At least 1 Scopus or ISI indexed publication.<br>At least 1 indeed conference presentation.<br>Patent: There is no patentable product or technology from this research.<br>Product: 1 A. A. A. At least five selected forage accessions equipped with high yield, good nutritive potential, and drought tolerance 2 A. A. A. At least 10 forage accessions added to the gene bank repository 3. A collective data on agro-morphology, biochemical profile, drought tolerance, nutritive value, A. analysis of the forage materials/People: 1 A. A. A. At least four personnel trained on identification, collection, and management of forage species 2 A. A. A. At least 1 BS/MS student working on forage breeding/Place: 1 A. A. A. Collaborative research with three UPLB research department (IPB, IOP&S, and OTR&A. A. A. At least 3 dairy farm partners who adopt the recommended forage materials and collaborate with us for future forage research and breeding/Policy: There is no policy/tax to be generated from this research. | University of the Philippines Los Baños (UPLB)  | The key stakeholders include forage crop and dairy cattle farmers, community extension staff, academe (e.g., students, researchers, faculty members), private organizations (associations and cooperatives), policy and decision makers, business community engaged in agro-industrial enterprises, smallholder farmers, and local government units.   | 01-Aug-24 | 31-Jul-26 | ONGOING                          | 4,998,483          | 2,534,179.20     |
|               | Improvements of the Egg Vending Machine as Commercial Model   | Rapid, inclusive and sustained economic growth                            | Balut is one of the delicacies in the Philippines that transcend geographical regions, and this traditional food item directly contribute to the performance of the duck egg industry. In our previous study, we have shown that the efficiency of marketing strategies for Philippine ethnic delicacies is highly dependent on understanding the processes, rituals, and human interactions with relation to balut as a cultural product. Balut is widely considered a local delicacy.<br><br>This market research will explore the potential of adopting technology in its marketing and distribution activities. Competitive marketing and distribution strategies based on inferences from empirical data can definitely improve the industry's production and growth rates.  | Publication: publications in Scientific journal (submitted for publication)/Patent: utility models for system components of balut vending machine/Product: 5 Balut vending machines/People: Balut stakeholders/Place: Memoranda of agreement (MOA) between PCAARRD and participating agencies as regards to the implementation of the program/Policy: Technical inputs to policies pertaining to promotion of the local duck egg industry   | University of Santo Tomas (UST)   | balut consumers and balut producers  | 01-Apr-24 | 30-Sep-25 | ONGOING                          | 5,000,000          | 3,373,619.20     |
|               | Improving Growth and Reproductive Performance of Caraga Black Native Chicken through Selection and Breeding   | Rapid, inclusive and sustained economic growth                            | Caraga State University (CSU) has developed the Philippine version of black chicken, which has the potential to be marketed as a "healthy meat" product. Locally known as "patani", the Caraga black native chicken is a black-skinned chicken with grayish flesh, black plumage, and comb. It has a distinct taste and is resilient to climate extremes (Alvarez, 2021). The black skin color can be associated with higher pigmentation and higher antioxidant level present in this chicken and has the potential for nutraceutical properties attributed to its higher market value (DOST-CARAGA, 2022). That is why it was not surprising that Caraga black native chickens gained enormous attention from the different sexes outside in the Philippines. The Philippine native chickens have higher muscle to bone ratio, less fat, and unique taste, flavor, texture, and nutraceutical compounds (Regorio et al., 2013; Alano, 2019). The health benefits of the native chickens are the reasons why the price of the native chickens' meat and eggs are higher than commercial chickens (Lambio, 2000). The Caraga State University established the data on the phenotypic characteristics of the Caraga black native chicken. However, for this native chicken to thrive and be subjected to commercialization, a study of the reproductive traits of the Caraga black native chicken is necessary. Fertility, hatchability, egg production, and growth are economically essential traits in local poultry production systems. The high fertility and hatchability of breeder stock and chicks high survivability produce large numbers of birds, which is why most breeders aim at conserving and increasing the productive efficiency of native chickens thus their genes for the improvement of the economic traits (Foleng et al., 2014). This study will be conducted to gather information and improve the reproductive traits and performance of the Caraga black native chicken thus breeding and selection. To date, the existing data on the Caraga black native chicken comes from the findings of the "breeding and purification of the project." The outcome of this proposed research will be used for managing and handling the Caraga black native chicken to improve the quantitative traits of Caraga black native chicken through strategic breeding and selection to ensure productivity and quality of breeder stock. | Publication: 2Patent: 10Product: 14, 24, 28, 26, 27, 28, 30People: 31, 32, 34Place: 38, 43, 44Policy: 48<br><br>At the end of two years, the project is expected to deliver the following:<br>1. Information on fresh milk quality as influenced by production practices, handling, packaging and marketing in Northern Mindanao<br>2. Reduced milk wastage due to spoilage by 80%<br>3. Validated technologies on milk handling, storage and packaging that are suitable for dairy farmers in Northern Mindanao  | Department of Agriculture Regional Field Office XIII (DA-RFO XIII), Caraga State University (CarSU) | The project beneficiaries are the following:<br><br>Native chicken raisers in Caraga Region and other Regions<br>Native chicken domestic and institutional consumers<br>Farmer Entrepreneur<br>Tourist Destinations sites<br>Faculty, researchers, students, NGOs, Cooperatives and other organizations who wish to engage in native chicken production<br>Women Government Organization (at least 50 women)<br>Local Environment Units (LGUs)<br>Youth Development Programs | 16-May-24 | 15-May-26 | ONGOING                          | 4,994,600          | 2,697,974.00     |
|               | Improving the Efficiency of Assisted Reproduction Techniques in Support to Dairy Cattle Breed Development   | Rapid, inclusive and sustained economic growth                            | the project aims to increase the number of genetically superior dairy cattle through the use of assisted reproduction techniques to enhance the reproductive efficiency and overall productivity of local dairy farms.  | Publication: 2Patent: 10Product: 14, 24, 28, 26, 27, 28, 30People: 31, 32, 34Place: 38, 43, 44Policy: 48  | University of Science and Technology of Southern Philippines Claveria Campus (USTP-C)               | Dairy Cattle Farms<br>Local Ruminant Farms<br>Milk Producers/Processors  | 01-Jan-25 | 31-Dec-26 | ONGOING                          | 5,000,000          | 3,125,180.00     |
|               | Integrating S&T Interventions with Common Farm Practices to Ensure Quality and Safety of Locally-Produced Cow's Milk (Enhancing the Handling and Packaging Technologies of Locally-Produced Cow's Milk) | Integrity of the environment and climate change adaptation and mitigation | The project will help the dairy farmers minimize milk spoilage and wastages while ensuring the quality of the milk produced in the farms and the it will be safe for the consumers. It will reduce milk deterioration attributed to long storage shifts in milk temperature because, as practiced by most full-faring farms, milk is stored at freezing temperatures and removed from freezers overnight to be delivered to the processing plant on the following day. The study will be integrating S&T technologies that will minimize milk contamination and keep the consumers safe from the ill effects these contaminations.  | At the end of two years, the project is expected to deliver the following:<br>1. Information on fresh milk quality as influenced by production practices, handling, packaging and marketing in Northern Mindanao<br>2. Reduced milk wastage due to spoilage by 80%<br>3. Validated technologies on milk handling, storage and packaging that are suitable for dairy farmers in Northern Mindanao  | University of Science and Technology of Southern Philippines (USTP)                                 | The following entities are the target beneficiaries that would potentially benefit from the project.<br>Local Government Units<br>Milk plants and processors<br>Dairy Farms<br>Schools implementing the milk feeding program<br>People in the community  | 16-Apr-22 | 15-Oct-24 | COMPLETED                        | 9,506,881          | 722,112.34       |
|               | Operationalization of the Swine Breed Registry System in the Philippines  | Rapid, inclusive and sustained economic growth                            | Establishment of the Breed Registry System (Phase 1) initially aimed to ensure the supply and quality of breeder animals sold locally and to legitimize local swine breeder farms. In support of the current initiatives of Accredited Swine Breeders Association of the Philippines (ASBAP) and in line with DOST-PCAARRD's Swine BR R&RD framework, a local Swine Breed Registry for purebred swine was developed. It is a web application with an embedded database where breeders input swine data into the system, request for swine inspection, and after actual farm inspection, the certificate requested will be approved. The certificate contains information on the pedigree and performance of breeder pigs.   | Publication:<br><br>Publish at least 1 improved Breed Registry User Manual.<br>Patent:<br><br>Possibly produce a copyrighted software<br><br>Product: Breed Registry System Web Application/People:<br><br>Train a minimum of 3 swine breeder farm representatives on the use of the improved Swine Breed Registry Software<br><br>Place:   | University of the Philippines Los Baños (UPLB)  | (1) Association of Accredited Swine Breeder Farms in the Philippines (ASBAP) members who can use the certificates as means of promoting quality breeders in the market.<br>(2) Academe and students(3) Multiplier and commercial swine farms that buy breeder animals for their specific purpose.  | 01-Jun-24 | 30-Nov-25 | ONGOING                          | 4,008,503          | 3,146,584.70     |

| 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, 2024 | Total Project Cost | 2024 PCAARRD GIA |
|---------------|---|---|--|---|---|---|-----------|-----------|---------------------------------|--------------------|------------------|
|               | Optimized Utilization of Brine as a Nutritional Supplement for Cattle in Batan Island, Batanes                          | Rapid, inclusive and sustained economic growth                            | The project will also result to optimized salt production processes and provide critical infrastructure for water security. The outcomes will directly benefit the batanes by improving food quality and security, ensuring consistent salt production, and providing the batanes with the overall well-being and economic resilience of the island. With this, the researcher aims to optimize the brine utilization in Uyugan, Batanes. The research results are deemed beneficial in supplementing cattle nutrition using brine, and in strengthening the production of salt which is already being commercialized by the Municipality of Uyugan in the Province of Batanes.  | (1) ISI- and/or SCOPUS-indexed Publications/ Journal Publication, (1) sea salt processing/ procedure for human and animal consumption will be applied with intellectual property protection, (1) prototype brine dispenser and one (1) Kerosene salt feed additive (2) migrant farmers at least three(3) personnel trained to use the salt processing machine. Memorandum of Understanding will be forged among NOLAs, LGUs, and SLUG during project implementation. LGU Batanes, LGU Uyugan, and LGU Marabut will have fruitful collaborations with DOST - PCAARRD, DOST RO2, PSTO Batanes, PLUGU Batanes - Provincial Veterinary Office, and Batanes State College. Policy recommendation on salt use.  | PSTO Batanes (DOST RI)  | The following are the groups/persons who will be positively affected in the conduct of this project.<br><br>LGU Uyugan<br>PLUGU Batanes<br>Nolan salt producers<br>Nolan fishermen and fish processors<br>Nolan cattle raisers<br>Foods and feeds industry  | 01-Oct-24 | 30-Sep-25 | ONGOING                         | 4,999,824          | 4,999,824.00     |
|               | Production Performance and Profitability Testing of Purified Native Pig Breeds  | Integrity of the environment and climate change adaptation and mitigation | In 2015, the DOST-PCAARRD funded a research initiative led by the Marikina State College in collaboration with the BANANGRO and other research institutions on the conservation improvement and profitable utilization of Philippine native pigs. The R&D initiative has resulted in the establishment of 6 breeding true-to-type native pig populations (Q-Black, Benguet Native Pig, Sinarangan, Isabela, Marikina, and Yookah) with with at least 80% uniformity in physical characteristics and with improved production performance and product quality. The program also developed technology on breeding and selection, free-range and healthcare management, feeding and forage production, and artificial insemination. The Q-Black native pig from Quezon province is one of the most significant genetic groups that has the potential for commercial native pig production. However, the production performance and profitability of Q-Black native pig is yet to be tested under farm-level. BuCoor, Marikina is one of the strategic areas for the testing of Q-Black native pig. BuCoor, Marikina has already been engaged with several DOST-PCAARRD projects and has the potential to promote native pig production as a livelihood option for the persons deprived of liberty or PDLs. Also, BuCoor has already been reported as ASF-free for many months and has pink status which will allow implementation of the project. The Cavite State University will provide technical expertise and will facilitate the conduct of this research in partnership with BuCoor, Marikina.   | Publication: Publications - At least 2 copyrighted EIC materials/promotional materials.<br>Patent: N/A/Product: Performance Data of Obscure Native Pig, established farm at BuCoor Marikina, 4 pigs for testing, 1000 pax (Personnel and PDL) trained for swine management and processing<br>1000 pax (Personnel and PDL) trained for swine management and processing<br>..... Place: Bureau of Corrections and Cavite State University/Policy: N/A   | Cavite State University (CVSU)  | LGU, PDL, ..., researchers and students, native pig raisers/farmers, Native pig industry, Lechoneros  | 01-Jul-23 | 30-Jun-25 | ONGOING                         | 5,000,000          | 1,587,405.55     |
|               | Rapid Enzymatic Fermentation and Nutrition Enhancement of Corn Stover and Rice Straw Silages                            | Rapid, inclusive and sustained economic growth                            | Livestock is one of the most important industries in the Philippines that largely contribute to our current food supply chain. However, shortage of fodder especially during the lean periods has negatively affected livestock productivity. Silage is a valuable feed resource utilized by farmers to maintain high livestock productivity during these times. The value of the feeding material is achieved through the natural action of microorganisms during the fermentation of different forage. However, several issues also affect silage applicability such as spoilage brought about by the presence of undesirable microorganisms, low aerobic stability, and low palatability. Different additives such as enzymes and lactic acid bacteria starter cultures are being explored to address these concerns and improve silage quality. The project is proposed to respond to one of the priority areas of the DOST-PCAARRD which is the enhancement of the country's current animal feed resources. Silage processing from corn stover and rice straw, which are major byproducts from corn and rice farming, will be refined through the use of additives. Cellulase and Xylanase enzymes will be used to maximize the digestibility of the forage substrates while microbial starter cultures will be formulated to produce high quality silage end-products. The results of the project are expected to help farmers and their families to have increased income due to the valorization of corn stover and rice straw wastes and increased livestock productivity. It will also impact the environment by providing an efficient way to valorize these waste products into highly valuable end products (i.e., silages). Lastly, development of a commercializable product for silage improvement will provide a sustainable response to the feed resource requirements of the Philippines.   | Publication: At least two (2) papers ready for submission to reputable, peer-reviewed, and SCOPUS-indexed scientific journals/Patent: Patent and/or utility model draft on enzymatic protocol for silage for submission to UPLB/TBDO; patent and/or utility model draft for a microbial starter culture for silage/Products: Enzymes (Cellulase and Xylanase)/Microbial starter culture formulation for silage/Enhanced corn stover and rice straw silage and product/People: At least one (1) seminar/training on the application of the developed enzyme product and microbial inoculant for silage/Place: Partnership with local farmer cooperatives for trial run/Policy: None  | University of the Philippines Los Baños (UPLB)  | Corn and rice farmers/Livestock farmers/Dairy industry/Consumers  | 01-May-24 | 30-Apr-26 | ONGOING                         | 4,997,555          | 2,605,740.00     |
|               | Serologic Evaluation of Herd Immunity Against African Swine Fever (ASF) in Backyard Pigs in Camarines Sur               | Rapid, inclusive and sustained economic growth                            | This research may provide significant implications for both local and national contexts. In Camarines Sur, where backyard pig farming is an integral culture, understanding ASF herd immunity will be beneficial for agricultural resilience, ensuring food security, and economic stability. Furthermore, gaining insights into ASF herd immunity may serve as an evidence-based model of biosecurity measures for farmers across the country. By providing data that may potentially benefit the country, this study aims to contribute to national policies and strategies, enabling more effective ASF control and prevention. Additionally, it adheres to the One Health perspective, recognizing the intricate interplay between human (psychosocial impact), animal, and environmental (nutritional impact) health, thus contributing to global efforts aimed at mitigating the impact of ASF while benefiting local communities and the wider international community alike.   | Publication: The output of this study will be subjected to presentation and submitted for publication if accepted in a relevant refereed journal, possibly a Scopus/Patent: The produced output of this research, such as an EIC material, will be subjected to a patent and recorded in the CBSUA/..., via PMO office/Product: The product produced in this study will be focused on the community-based framework for the Local Government Unit policy guide. This will be subjected as mentioned in the presentation and publication/People: As mentioned in the methodology, the concerned community will be given the opportunity to know the importance of these undertakings and be able to give them knowledge as to mitigation, prevention, and specific guidance/Place: The created policy in this study will be the basis of the LGU to address the gaps identified for implementation/Policy: Assessment of government policies and programs in place to control ASF. Implementation and adherence to preventive measures promoted by healthcare authorities through creating a community-based framework that will serve as a guide. | Central Bicol State University of Agriculture (CBSUA)                                 | This project will benefit the local backyard farmers of Camarines Sur province. This study will also benefit the province's LGUs and provincial veterinary health units.  | 01-Sep-24 | 28-Feb-26 | ONGOING                         | 3,290,275          | 2,682,350.00     |
|               | Strengthening the Thriving Duck Egg Industry in Negros through the Introduction of tikPNAS                              | Poverty reduction and empowerment of the poor and vulnerable              | Negros Oriental is not a major duck producing province. In 2022, there was an inventory of 84,000 heads as reported by the Provincial Veterinary Office of Negros Oriental. The Philippine Statistics Authority (PSA) reported 171,153 ducks in Negros Oriental for January 2023 which represents a meager 1.2% of the national population. Despite the low production in the province, Negros Oriental received 3.9M balut eggs from Central Luzon in 2022 according to the Bureau of Animal Industry. This amount is expected to increase since for the month of January 2023 alone, the Bureau of Animal Industry has reported 1.1M balut eggs entering Negros Oriental. One of the limitations of Negros Oriental duck industry is the type of ducks used. At the moment, duck farmers use their own stocks whose breeds are not known in order to produce the next generations. This results in birds that have varying characteristics especially that many duck farmers mix ducks of different ages. These pose challenges in projecting production and nutrition as varying sizes will have different nutritional needs. Furthermore, threat of Asian Influenza (AI) hinders ease in transport of live breeder animals especially in inter-island shipment particularly in areas affected by AI. In 2006, tikPNAS (IP) was launched by DOST-PCAARRD. This breed includes 2 purelines (IP-Aim and IP-Kaha) and a commercial hybrid line (IP-Kayamanggi) that is bred to produce eggs for balut and salted eggs. IP produce around 270 eggs/duck/year which is higher than what most traditional or mongrel ducks can produce. Further, IP mature birds weigh uniformly around 1.1 to 1.3 kg. These characteristics allow for better production and management. Several studies have been conducted on the management of IP and its advantages for duck production. However, IP is not yet used and available in Negros Oriental. This project will establish an IP breeder multiplier farm and create stable supply of IP. Kayamanggi farm specific management practices in order to encourage and promote its use so that Negros Oriental will be less dependent on other provinces for its duck egg needs. This will further help the local economy by creating livelihood opportunities for women, youth, and men. Furthermore, the establishment of legitimate source of IP in Negros Oriental will ensure sustainability of quality breeder stocks for duck egg production with or without transport restriction due to AI. This project will partner with local farmers and institutions to help develop management systems and leverage on these partners' networks to further promote IP and duck farming as a whole. | Publication: EIC materials (technique and brochures) for Duck egg production and marketing, and costs and returns/Patent: Paper on IP management in Negros Oriental/ Paper on value chain analysis of the duck industry in Negros Oriental/Product: 10,000 female IP Kayamanggi produced in the breeder farm/Database of duck farmers in Negros Oriental/Profile of Negros Oriental duck farmers and their practices/People: 15 capacitated women in Duck production/10 farmers trained in Duck production/10 capacitated women in making Balut/15 capacitated women in making salted eggs/15 Capacitated women in entrepreneurial activities related to tik PNAS/15 capacitated women in using IP eggs for balut/Place: MOA with PCAARRD regarding implementation of the project/MOU with other schools, government institutions, associations, and private farmers. MOU with LGU-ns for training of farmers (men, women, youth)/Policy: Promotion of locally produced IP products   | Foundation University (FU)  | 1. Existing layer duck farmers, 2. Potential duck farmers, 3. Balut and salted egg vendors, 4. Balut and salted egg processors, 5. Consumers of duck eggs and (culled) duck meat, 6. Agriculture Technicians, researchers, teachers and students in layer duck breeding, production, and marketing. | 01-Mar-24 | 28-Feb-26 | ONGOING                         | 4,998,052          | 874,488.00       |
|               | Varietal Improvement and Innovative Production of Alfalfa (Medicago sativa) to Augment Feed Resources for Dairy Animals | Rapid, inclusive and sustained economic growth                            | Improving livestock production and productivity is to introduce improved forage integration and proper supplementation with leguminous forages. One such potential legume species for integration into existing livestock feeding system is alfalfa (Medicago sativa). Pioneering research on alfalfa will enable to select and identify high yielding and better quality forage adaptable to Philippine agro-ecologies and production systems particularly grown in mid-elevation condition. Recommended cultural management practices for herbaceous legumes.  | Publication: Publish at least one research output to scientific journal/Patent: N/A/Product: Production of seeds (seed increase) and silage/People: Engage BS Agriculture students major in Animal Science and Dairy Science/Place: Forage MOA/MOU with People/..., via Organization, Local Government Unit and Farmer Cooperators/Policy: N/A  | University of Science and Technology of Southern Philippines Claveria Campus (USTP-C) | Local dairy farmers<br>Livestock industry<br>Research community<br>Local government units   | 01-Aug-24 | 31-Jul-26 | ONGOING                         | 5,000,000          | 3,246,629.72     |
|               | Conservation, Improvement and Production of Central Luzon Native Pig  | Rapid, inclusive and sustained economic growth                            | A nucleus farm of native pig will be established. Breeding objectives will be formulated based on the farmers' interest and the breeders' requirements and also based on the requirements of the breeder processors. The results of phenotypic and molecular characterization of native pigs in Project 1 will be the basis of selection of foundation native breeders. Further evaluation of male and female breeder stocks will be conducted and the sperm of male animals will be evaluated based on visual and efficacy assessment of ejaculate, such as semen volume and sperm concentration, motility, and morphology. Preferably, males with acceptable physical characteristics, and sperm quality will be used as breeders based on the description of Risenbloom (2000).   | Established foundation herd at PSAU<br>Established breeding and selection protocols<br>Produced foundation stocks populations of CL native pig  | Pampanga State Agricultural University (PSAU)   | a. Native pig raisers<br>b. Researchers and development workers<br>c. Students<br>d. Consumers<br>e. Market agents<br>f. Local government   | 01-May-21 | 30-Apr-24 | COMPLETED                       | 6,354,300          | 792,385.80       |
|               | Conservation, Improvement and Production of Central Luzon Native Pig  | Rapid, inclusive and sustained economic growth                            | Breeder animals from the nucleus farm will be tested and evaluated at the multiplier farms based on their reproductive and growth performance.   | Reproductive and growth performance data of improved CL native pigs<br>Trade name/mark applied for registration at IPO<br>Established multiplier farm at PSAU<br>Established feeding and healthcare management protocols<br>Conducted techno-promotional activities<br>Trained 40 farmer co-operators on production and management of CL native pig<br>Established 4 private techno-demo farms<br>Developed techno-guide on reproduction of CL native pig   | Central Luzon State University (CLSU)   | a. Native pig raisers<br>b. Researchers and development workers<br>c. Students<br>d. Consumers<br>e. Market agents<br>f. Local government   | 01-Jul-22 | 30-Jun-26 | ONGOING                         | 4,177,066          | 1,051,084.34     |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---|---|--|---|--|---|---|-----------|-----------|----------------------------------|--------------------|------------------|
| Novel Approaches in African Swine Fever Diagnostics, Genomics, and Proteomics (Old Title: MEGA ERA/DICATE ASF (Molecular Epidemiology, Genetic Analysis, Epitopes of Recombinant Antigenic Determinants, and Immunologic Characterization for Total Elimination of African Swine Fever) | Proj 4. Gene Expression Profiles of Immune-Related Cytokines: Highlighting the Potential Role of Cellular Immunity against Local Isolates of ASF in the Philippines | Integrity of the environment and climate change adaptation and mitigation  | African Swine Fever is a highly contagious disease that causes high mortality swine. There is no treatment and vaccine and the only way to control is to isolate affected and exposed swine. These measures stimulate development of animals, biosecurity in farms, and banning the importation of meat products from affected countries. Early detection and diagnosis are critical for effective control of disease spread. However, for this to be successful, adequate laboratory support and effective diagnostic platforms must be available. The limited data on the genetic characteristics of ASFV makes it challenging to develop diagnostic platforms that are specific to a local setting. Knowing the ASFV specific diagnostic tools and markers. Hence, this study aims to utilize molecular techniques to develop tools for detection and immunological characterization of African Swine Fever virus in the Philippines. Obtaining ASF isolates from cell culture and determining whole genome sequences of ASF isolates in the Philippines will aid in the molecular characterization of ASFV straining outbreaks in the Philippines, phylogeographic patterns of outbreak, and eventually aid in the prevention and control of ASFV in the country. Through genomics, we propose to develop recombinant ASF proteins and antigenic epitopes specifically circulating in immunity that will be used for the development of ELISA. In order to elucidate their relative contributions of immune-related cytokines, chemokines and cell receptors ASF-infected pigs, we will investigate molecular mechanisms mediating viral pathogenesis, pathogen-host interaction, and immune responses of the domestic swine disease in the country. The materials and information outputted by this program are all important in the development of local ASF vaccine. | 1. Quantified relative expression levels of immune-related cytokines in the whole blood and macrophages of ASF-affected and exposed swine. 2. Comparative expression analysis of blood and macrophages stimulated with recombinant proteins to elucidate the extent of the host immune responses to ASFV both in natural infection and in vitro stimulation. 3. List of potential ASFV recombinant proteins that recognize ASFV which can be used for future vaccine and diagnostic technique development. | University of the Philippines Los Baños (UPLB)  | 1. Outputs from the project will aid government organizations such as the Department of Agriculture and the Bureau of Animal Industry for policy recommendations such as control and prevention strategies against ASF. 2. Published data can help scientists in the development of potential diagnostic methods, drug and vaccine candidates. 3. Veterinarians will be guided in their evidence-based decision making in the epidemiological surveillance and implementation of effective control and eradication strategies against ASF. 4. Farm owners will be benefited by the improved diagnostic efforts, policy recommendations, and control and eradication strategies which will help alleviate the socioeconomic consequences caused by the ASF outbreak. 5. Undergraduate students from the cooperating academic institutions will be able to learn the laboratory skills and techniques used to conduct related researches in the future. | 01-Apr-23 | 31-Mar-25 | ONGOING                          | 16,826,512         | 5,616,652.72     |
| Application of the Single-laboratory Validated Radio-Receptor Assay to Support Environmental Risk Assessment (ERA) on Ciguatera Poisoning   | Rapid, inclusive and sustained economic growth  | Ciguatera Poisoning (CP) is a major risk from the consumption of several species of tropical fish. This ignored disease represents a serious problem for community health, tourism and fishing industries in countries with tropical reef ecosystems. It is an increasing problem that exacerbated by degradation of coral reef ecosystems (Darius et al., 2007). CP in the Philippines and worldwide is characterized by limited knowledge of the biology of microalgae species causing toxic outbreaks (mainly <i>Gambierdiscus</i> spp), their toxin production, their distribution and their uptake plus toxin metabolism by fish species. Other negative factors are the lack of recognition of CP, epidemiological studies, adequate specific treatments, low public awareness and poor capabilities for predicting the toxicity of fish production areas or measuring toxin levels in harvested fish (Chinain et al., 2010). In this proposed project, the Receptor Binding Assay technology established during the previous projects will be applied further for the analysis of other marine invertebrates. An RBA based assay for CP will be designed for the country to have capabilities to analyze CFP levels in seafoods. This will assist the regulatory body to have a monitoring scheme on CFP, and will cater private companies who export either fresh or canned seafoods to comply with the international standards on the levels of contaminants/toxins in their products. The RBA for quantifying ciguaterins are developed using the AOAC guidelines in method development for wide acceptance and accreditation.   | Publication: Scientific publication<br>People Services: Trained personnel on RBA from BFAR laboratories<br>Places and Partnerships: BFAR Central Region 6; health institutes such as the Epidemiological Bureau   | DOST-Philippine Nuclear Research Institute (DOST-PNRI)   | Bureau of Fisheries and Aquatic Resources, Region 6 and Central Office<br>Provincial and Municipal Agricultural offices of Region VI<br>Health institutions in Region 6   | 16-Nov-24   | 15-Nov-26 | ONGOING   | 12,144,717                       | 8,424,796.00       |                  |
| Assessment and Innovation in Reducing Post-Harvest Losses for Enhanced Profitability and Sustainability in Sardine Fishery in Tawi-Tawi, Southern Philippines   | Rapid, inclusive and sustained economic growth  | The study builds upon the findings of a recently completed DOST PCAARRD-funded project on the fish reproductive biology and catch documentation of small-scale commercial sardine fishery in the Sulu Archipelago. The previous study found that local fishers in Bongao mainly catch sardines using Kuluks, a small-scale commercial fishing vessel that uses nets. The catches are mainly landed local at the landing site near the public market, Bongao, which has a population of more than a hundred thousand people, is the capital and commercial center of the province of Tawi-Tawi. The previous study identified post-harvest losses as one of the major issues in the sardine fishery primarily due to a lack of post-harvest facilities such as solar driers and storage, as well as limited market access. This has resulted in significant drops in prices, with some fish being given away or discarded. The study aims to assess the extent of post-harvest losses in the sardine fishery and identify their major causes, as well as their impact on fishers. Furthermore, the study will evaluate the feasibility of innovative solar drying technology developed by DOST and used by the NICSS project MSU TCTO for seaweeds. This technology has the potential to be adapted for use with sardines. Additionally, the study will introduce a smoking technique as a strategy to address post-harvest losses. Generally, the crucial in providing valuable insights into the challenges and opportunities for reducing post-harvest losses in Kuluks fishery. It will inform the development of targeted interventions to improve the sustainability and profitability of the fishery. Furthermore, it will contribute to enhancing the resilience of the small-scale commercial sardine fishery in the Sulu Archipelago, and contributes to the local food security. | Publication: 2 manuscripts submitted for publication in ISI indexed journal<br>Manual on drying technique<br>Manual on smoking technique<br>Patent:<br>Solar drier<br>Smoking facility<br>Product:<br>2 Solar driers fabricated<br>1 Smoke house fabricated<br>2 types of product (Dried and Smoked Sardines)<br>People:<br>Support at least 1 undergraduate thesis student<br>Develop capacity of MSU TCTO, MAFAR and fishers on drying and smoking techniques<br>Place:<br>MOA with MAFAR and Kuluks operators<br>Policy: S&T based information that help inform policies and management plans to effectively address post-harvest losses, improved income for the fishers, and sustainable sardine fisheries   | Mindanao State University - Tawi-Tawi College of Technology and Oceanography (MSU-TCTO)  | Local small-scale commercial and municipal fisheries sector<br>Fisheries stakeholders & consumers<br>LGUs<br>MAFAR<br>Academe   | 01-Mar-24   | 28-Feb-26 | ONGOING   | 8,013,992                        | 2,839,835.00       |                  |
| Assessment and Mobilization of Research Initiatives on Philippine Marine Mammals (PHLMarMams)   | Integrity of the environment and climate change adaptation and mitigation   | To date, there are 31 species of marine mammals (30 cetaceans and the dugong) in the Philippines (Aragones, unpublished data). Globally, there are 83 cetaceans and 4 sirenians. Studies on Philippine marine mammals have been wanting. The more recent limited studies have been mainly conducted by the Marine Mammal Research & Conservation Laboratory of the Institute of Environmental Science & Meteorology of the University of the Philippines - Diliman in collaboration with the Philippine Marine Mammal Stranding Network (PMMNS), BFAR and CS PHIL (for the dugong part). Most of these have had limited funding and were especially limited in scale (coverage & duration; except the stranding data, which is national and 15 years running). The other related literature is already old (1990s and early 2000s). Unfortunately, these animals are already vulnerable due to their demanding biology: long-lived, large size, mostly single live birth, extensive pre-reproductive period, resulting in low reproductive potential. In addition to these biological vulnerabilities, these animals are mostly threatened by overexploitation, by catch, pollution, changing climate, and habitat degradation and loss. Under the IUCN Red List, most marine mammals are either threatened, vulnerable, endangered and critically endangered. Proper management of these species, require information on data on their abundance and distribution (i.e., ecology and population genetics). Also, the quantification and documentation of their threats is imperative to address these problems systematically. It is about time that the Philippines comprehensively study these megafaunas in the light of our changing environment and continuing biodiversity loss.  | End of the Project Outputs/Products/Assessment Profile Tazon Strait and Calauit Island. Enhance Repository for the samples collected from stranded marine mammals<br>Publication/At least one (1) peer-reviewed publications<br>People and Services/One (1) mentored MS student/Conduct one (1) necropsy training/ twenty (20) trained personnel to necropsy and pertinent samples collected.<br>Places and Partnerships/Partnership with LGUs in southern Tazon Strait, Negros and Cebu in Visayas and in Calauit Island in Palawan. Partnership with BFAR, DENR and CS/PH<br>Policy/Results of the study can be used as input to policy conversation of Philippine Marine Mammals in Tazon Strait (Negros and Cebu in Visayas) and in Calauit Island in Palawan.  | University of the Philippines Diliman (UPD)  | Select Local Government Units (LGUs) (Regions 4B & 7)<br>Local communities and Indigenous People (IPs)<br>Bureau of Fisheries and Aquatic Resources (BFAR)/Department of Environment and Natural Resources (DENR) (Regions 4B, 7)   | 01-May-22   | 30-Apr-24 | COMPLETED | 5,000,000                        | 643,062.93         |                  |
| DeepFish 2.0: Mesophotic Depth Fish Surveys using an ROV-mounted 360-degree Imaging System  | Rapid, inclusive and sustained economic growth  | The availability of high-resolution underwater cameras that are mounted on open-sourced Remotely Operated Vehicles now allow for long-term abundance surveys in both horizontal and vertical directions to be conducted at lower costs and without the diver risks inherent in deep dives. As a platform, the ROV has the advantage that it is capable of hovering above the seafloor in a direction controlled by the operator from a laptop surface vehicle and the camera angle can also be changed. In this project we propose a stereo camera system mounted on an ROV that collects videos to provide qualitative and quantitative information for fish in mesophotic ecosystems. Sea trials will be conducted in Verde Island Passage while surveys will be undertaken Catiagan, Batangas, Apo Reef National Park, and Bolinao, Pangasinan.   | Publication:<br>Paper describing the system for presentation in a local/international conference<br>Patent:<br>Filed 1 Patent or Utility Model or Copyright for 360-degree camera set up and survey protocol<br>Product:<br>1 ROV-based Mesophotic Fish Survey System (one for conventional cameras and one for 360 degree cameras) (Note: 360-degree cameras can only be deployed at upper mesophotic depths (up to 40 m) due to limitations of camera castings)<br>People:<br>Technical training and knowledge on the use of the ROV system for at least 5 researchers  | University of the Philippines Diliman (UPD)  | Marine science researchers in the different Philippine universities<br>Local Government Units (LGUs) and NGOs tasked with monitoring the marine ecosystem   | 01-Jun-24   | 31-May-26 | ONGOING   | 13,939,174                       | 4,412,587.00       |                  |
| Developing Sustainable Macroalgal Feeds to Enhance Production of Sea Cucumber Culture   | Integrity of the environment and climate change adaptation and mitigation   | The overexploitation of wild sea cucumber stocks has affected the livelihood of many fishing communities. As this dilemma continues to persist, stock enhancement efforts and aquaculture programs were initiated. However, the dependency of hatchery rearing on cultured live macroalgae as feed remains a major bottleneck in the production of juveniles for grow-out. Hence, the development of alternative supplemental feeds that are optimal for growth but are accessible and less costly is strategic. In this project, different locally available species (e.g., <i>Sargassum</i> , <i>Ulva</i> , <i>Gracilaria</i> , <i>Sargassum polyceratum</i> , <i>Ulva</i> sp., and <i>Gracilaria</i> sp.) will be tested to determine their effectiveness in enhancing growth and survival of juveniles of two high-value sea cucumbers, <i>Holothuria scabra</i> and <i>Stichopus diabolus</i> . Hatchery and field trials to be conducted will be geared towards the refinement of the use of macroalgae (i.e., <i>Sargassum</i> ) as early juvenile feed that can be used to develop sustainable, affordable, and locally available feed for enhancing sea cucumber juvenile culture in the hatchery and ocean nursery. This project will capitalize on the diversity of seaweed resources in the country and will address the challenges of developing sustainable aquaculture systems that will have socio-economic benefits for different stakeholders, while maintaining the productivity of coastal ecosystems.   | End of the Program Outputs/Products/At the end of the project, it is anticipated that an alternative/supplemental macroalgal feed for H. scabra and S. diabolus will be developed/Alternative nutritional factors (ANFs) are characterized, and threshold concentrations determined/Published/At least one paper submitted for publication/Paper presenter presentations in regional/local conference/Alternative/Intellectual Property/Process of sediment enrichment/People and Services/In this 2-year project, researchers and graduate students will be mentored and trained in hatchery production and ocean nursery rearing of two sea cucumber species. In addition, at least 2 research assistants/students will be trained/People and Partnerships/Interdisciplinary collaboration with researchers specializing in seaweeds including private and academic institutions/Policy/S&T-based recommendations on management of sea cucumber and seaweed resources, focused on S. diabolus and H. scabra for LGUs and DA-BFAR  | University of the Philippines Diliman (UPD)  | The research/scientific community, as results generated from the abovementioned studies and observations will open doors for further researchable areas on sustainable mariculture feeds and practices and fishery stock management (e.g., culture-based restocking and stock enhancement)/Local fisher partners in pilot demo sites/LGU and local resource managers will have science-based information to improve sea cucumber fisheries management | 01-May-23   | 30-Apr-25 | ONGOING   | 4,988,589                        | 1,339,878.23       |                  |



| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---------------|---|--|---|---|--|--|-----------|-----------|----------------------------------|--------------------|------------------|
|               | Development of qPCR Assay for the Detection and Quantification of Harmful Karenianacean Dinoflagellates in Selected Coastal Waters of Central Luzon | Rapid, inclusive and sustained economic growth | Harmful algal blooms (HABs) caused by dinoflagellates of the family Karenianaceae pose significant threats to marine ecosystem and human health. Understanding their spatio-temporal distribution and genetic diversity is crucial for effective management and mitigation strategies. In the Philippines, monitoring programs have heavily relied on morphology-based identification. However, this is time-consuming and labor-intensive requiring taxonomic expertise, and sometimes lead to high levels of technical bias and inconsistency. Therefore, the proposed project aims to develop a qPCR assay for quantifying the spatio-temporal abundance of harmful karenianacean dinoflagellates in three coastal waters of Central Luzon. This type of molecular technique requires a laboratory established cultures to create a species-specific primer and target the harmful species using the karenianacean cultures established from the previous project, this limitation can be addressed. The developed qPCR assay will be tested on water samples collected from selected coastal waters of Central Luzon with a high diversity of karenianacean dinoflagellates.<br><br>As part of the priority projects under the Natural Resources and Environment R&D Agenda of Updated Harmonized National Research and Development Agenda in Agriculture, Aquatics and Natural Resources (2022-2028) of DOST-PCAARRD, the proposed project will provide valuable information in support to the Biodiversity R&D program which will specifically focus the genetic diversity and temporal abundance of karenianacean dinoflagellates in the marine ecosystem using qPCR assay.<br><br>This study aims to establish a high-resolution method to look into the diversity and quantification of the karenianacean dinoflagellates in the three main coastal areas of Central Luzon which will assist the country's monitoring program and fish-farming operators. With the effective and efficient molecular method, BFAR will efficiently monitor and understand the occurrence of harmful karenianacean dinoflagellate and issue early warnings to local stakeholders to   | Publications<br><br>At least 2 International Scopus Indexed Publications<br><br>Presentation in local and international conferences<br><br>Products<br><br>Culture of small karenianacean dinoflagellates species<br>Protocol in using qPCR for identification of karenianacean dinoflagellates<br>EAC materials on karenianacean dinoflagellates<br>Infographics about karenianacean dinoflagellates<br><br>People and Services<br><br>Training of fisheries technician and BFAR monitoring personnel in the use of qPCR in identification of small dinoflagellates<br><br>Undergraduate Thesis Students   | Central Luzon State University (CLSU)  | Academic and research institutions<br>BFAR monitoring personnel<br>Fish farming operator<br>LUGS<br><br>Academe  | 01-Aug-24 | 31-Jul-26 | ONGOING                          | 5,000,000          | 3,099,999.00     |
|               | Diversity, prevalence and virulence of the Ostreid Herpesvirus-1 (OshV-1) to enhance sustainability of oyster production in the Philippines (ViOyS) | Rapid, inclusive and sustained economic growth | The potential for oysters to continue early warnings to local stakeholders to significantly to the fisheries sector in the Philippines is high. Although the industry has started picking up in recent years, many aspects of the commercial production are yet to be improved. This includes understanding the threats and risks that may be experienced by the Philippine oyster industry, such as potential diseases causing mortality and low-quality products. Some of these threats include the Ostreid herpesvirus (OshV-1), which significantly affected many industries in Europe, America, and some parts of Asia but has never been reported and investigated in the Philippines due to lack of studies to detect and monitor its presence and prevalence. Initial results of the DOST-PCAARRD-funded project entitled SCOSOS, knowledge and genetic diversity of microvariants of these OshV-1 viruses in some of the oysters collected in both the wild and hatchery settings. This proposed study then aims to understand the diversity, prevalence, and virulence of oyster-infecting viruses and their microvariants and hosts in the Philippines, and test the susceptibility and factors driving infections in oysters to enhance sustainability of the oyster industry in the Philippines. It will use a combination of culturing, molecular biology assays, omics approaches, and deep learning to understand the ecology and dynamics of the virus and the potential approaches to mitigate and lessen its effects in the local settings. This collaboration will strengthen research partnerships and direct translation of research to developmental settings with the IP Diliman and UST leading the research and the IACAF-BFAR-NBIC and the private industry AGIN Inc. directly benefiting from the results of the study. Their experiences can then be models for other sectors and industry players.<br><br>Having taken off from the NICER Sea Cucumber R&M-D Center Program under the Project, Refinement of Culture Production of the Sandfish <i>Holothuria scabra</i> (Jaeger, 1833) in Mindanao, we were able to upgrade our hatchery and laboratory facilities, and also gain valuable knowledge and experiences that can be used to take the project to greater heights to help address the gaps in sandfish pond culture and community-based growth, and the decline of sandfish wild stocks. From the refinement of culture production, the project will move forward to culture of the sandfish in earthen ponds. By shifting the focus from mass producing in ocean nurseries to mass producing sandfish in ponds and sea pens, can lead a significant breakthrough in sea cucumber aquaculture, especially here in the Philippines where there is very limited data on fishpond grow-out. Developing protocols for culture and sandfish in earthen ponds, experiments to determine best suited feeding techniques for grow-out, and options for viable polyculture.<br><br>The NICER Project witnessed that results were better with an engaged community with this, the project will strengthen community participation and engagement since science cannot be applied without the community. To further supplement their livelihood, post-harvest and processing trainings will be enhanced for better value-added products. Sea cucumber fishing is an important livelihood in coastal community and harvesting of sea cucumbers from the wild has been a staple in coastal communities. The Project will continue to conduct seeding of sandfish juveniles for stock enhancement in identified locations to help alleviate the declining population of sandfish in the wild.<br><br>As the Niche Research Center for Sea Cucumber, we received Certificate of Commendation as Expedition Champion in Region 10E during the DOST National Innovation Day in Region 10, and as SeaCucumber Niche-R&M-D Center during the DOST Science for Change Program summit @ Mindanao Cluster.  | Undergraduate Thesis Students<br><br>Publication: Due to the novelty of the proposed work, several scientific (S1) publications are expected, including but not limited to: diversity of oyster viruses in the Philippines, genome characterization of OshV-1 in the Philippines, factors driving the virulence of oyster viruses, susceptibility of different oysters to various oyster viruses, host-virus specificity and interactions, among others.<br>The project will be able to come-up with protocol guidelines for the 1) isolation, 2) rapid detection, and 3) possible methods to mitigate the effect or control of infections Patent: N/A<br>Product: Improved techniques and protocols on detecting the virus using rapid assay (LAMP), and also mitigation guidelines to control the spread of viruses in oyster farms<br>People: This research will protect the consumers and growers. It will also lead to a more resilient oyster industry, safeguarding food security and the livelihood of families dependent on oyster growing Place: Active collaboration between communities of oyster growers, national agencies, academic institutions, and industry partners in collating data in occurrence of OshV-1.<br>The project will also further strengthen the partnership initially established during the SCOSOS project between the private, NGA and academe, and even expanded by including UST in one of the cooperating institutions.<br>The Laboratory to be built in BFAR-NBIC will help enhance and build the capacity of NGA and local SUCs in the use of molecular methods, and can even be a training and demo hub for the technologies to be developed Policy: Since there are no studies yet of viruses in the Philippines, results of this work will help in crafting of management and strategic plans to avoid or lessen spread of these parasites in Philippine oysters. Specifically, this will aid in crafting policies regarding translocation of virus free spats and broodstocks which is one of the gaps identified in the oyster roadmap. | University of the Philippines Diliman (UPD)  | The project will benefit various stakeholders of the oyster industry/Consumers will have access to safe and virus free oysters Oyster growers will be guided in managing environmental risks factors OshV-1 This will prevent mass mortality events which will affect their livelihood. Oyster hatcheries will be able to refine the prescribed hatchery protocols to account for OshV-1. This will reduce mortality and increase production. Local government units will be able to propose and implement appropriate policies guided by the results of this study/Government agencies will have the capacity to monitor the occurrence of OshV-1 with the assistance of higher educational institutions and DOST-PCAARRD. Higher educational institutions will be able to contribute to the body of knowledge specially on the effects of OshV-1 to the local oyster population, specifically <i>Crassostrea irradia</i> . | 01-Apr-24 | 31-Mar-27 | ONGOING                          | 37,000,000         | 15,200,559.00    |
|               | Enhancing production of sandfish, <i>Holothuria scabra</i> (Jaeger, 1833) through pond culture and sea pen farming                                  | Rapid, inclusive and sustained economic growth | The Philippines has been a significant producer of seaweeds for over five decades, primarily driven by global demand for carrageenan. Despite the substantial contribution of the Sulu archipelago to this industry, challenges such as declining production due to genetic diversity loss and sea lice disease persist. Moreover, women engaged in seaweed farming often encounter gender disparities, hindering their opportunities and financial well-being. To comprehensively address these multifaceted issues, we propose a holistic approach. Firstly, we aim to enhance the production system by evaluating the viability of multiplier farms in sustainably supplying quality seedlings and testing the effectiveness of Kappaphycus extract or K-kap in improving seaweed production. Secondly, we will conduct a comprehensive socio-economic analysis, focusing on both traditional and multiplier farms, from a gender perspective to assess if the multiplier farm will improve gender inclusivity. We will establish multiplier farms in two major seaweed-producing municipalities of Tawi-Tawi to mass propagate laboratory-generated seaweed strains. Additionally, we will assess the cost-benefit of these farms to ensure sustainability. Furthermore, the multiplier farms will serve as a testing ground to evaluate the efficacy of Kappaphycus extract or K-kap as a sustainable alternative to conventional inorganic fertilizers. To gain a comprehensive understanding of the challenges, perspectives, and experiences within the seaweed farming sector, we will conduct interviews, key informant interviews (KIs), and focus group discussions (FGDs). We'll utilize a socio-economic questionnaire along with the Niche Framework and the Niche Analytical Framework for Gender Analysis. These methods will be applied in the regular seaweed farming communities and among participants in the multiplier farm project, ensuring equal representation of women and men farmers. Additionally, we will interview children who assist their families in seaweed farming. By integrating a gender perspective, our aim is to evaluate if the multiplier farm can enhance gender equity. This approach enables us to compare insights, identify commonalities, and analyze socio-economic dynamics and gender roles within the seaweed industry. It ensures that research findings represent diverse voices and perspectives within the community. Understanding these dynamics is crucial for shaping policies that promote the sustainable growth of the industry.<br><br>The sandfish species, <i>S. lemanu</i> , is an important food fish commodity and the management of its stock is a top priority. Part of the identified efforts to support resource management is the development of culture techniques that will allow the production of the species in a controlled environment. This project will entail numerous exploratory and experimental trials over a period of years and continuous funding for a successful development. As a critical venture, investigating its achievability is crucial to ensure that resources and efforts would not be wasted. Therefore, this feasibility study is proposed to do a comprehensive review of available resources on the successful conduct of breeding and rearing of sandfish, which will serve as the basis for the development of a hatchery program for <i>S. lemanu</i> in the country.<br><br>The project being proposed aims to expand a similar initiative in Region 10A, particularly in the multiplier farms, which is also a major activity of the coastal communities. Pre-selected fast-growing cultivars from PSU-MSL shall be utilized as seedstocks for the establishment of seaweed experimental plots in selected sites in Batangas. This is to mitigate the declining production of seaweeds in Batangas Province, identification of new farming sites could be one of the immediate solutions to augment the current scenario by using laboratory-reared cultivars from the branch and spore culture. The genetic variability in the newly generated seedstocks from spores is hypothesized to improve the quality of the cultivars. In addition, to have a successful introduction of seaweed farming among selected municipalities in the province, socio-economic profiling of the coastal communities will be implemented. This will determine the acceptability of the selected coastal communities of the introduction of seaweed farming as a possible alternative livelihood and source of income. | Publication: at least 1 paper published in recognized scientific journals, 2 technical papers presented in scientific conferences; Patent: Manual for the culture of sandfish in fishpond; and/or, enhanced version of the manual on community-based sandfish farming; Product: Better quality of farm produced, true proper post-harvest, handling and processing; A improved protocols on sea ranching with local community; A, Natural stocks of sea cucumber enhanced; and mass production of sea cucumbers in fishpond; People: LUGs as local partners trained on sandfish production and post-harvest technology, including at least 4 neighboring LUGs; A, A these students in both undergraduate (4) and graduate (2) studies will be assisted by the project in the A conduct of different experiments on sandfish; Place: partnership with at least 2 HEs and with the local government units within the region enhance; Policy: Policy brief on stock enhancement and harvest of sea cucumbers<br><br>The NICER Project witnessed that results were better with an engaged community with this, the project will strengthen community participation and engagement since science cannot be applied without the community. To further supplement their livelihood, post-harvest and processing trainings will be enhanced for better value-added products. Sea cucumber fishing is an important livelihood in coastal community and harvesting of sea cucumbers from the wild has been a staple in coastal communities. The Project will continue to conduct seeding of sandfish juveniles for stock enhancement in identified locations to help alleviate the declining population of sandfish in the wild.<br><br>As the Niche Research Center for Sea Cucumber, we received Certificate of Commendation as Expedition Champion in Region 10E during the DOST National Innovation Day in Region 10, and as SeaCucumber Niche-R&M-D Center during the DOST Science for Change Program summit @ Mindanao Cluster.   | Mindanao State University (MSU-Naawan)   | LUGs, local communities, A, fisherfolks, A, Peoples organization, Students, Researchers, national line agencies, A, Academic, private investors  | 01-Jan-24 | 31-Dec-25 | ONGOING                          | 5,000,000          | 2,910,048.00     |
|               | Euchematoid Seaweed Farming Innovation in the Sulu Archipelago (SeawhInovate)   | Rapid, inclusive and sustained economic growth | The Philippines has been a significant producer of seaweeds for over five decades, primarily driven by global demand for carrageenan. Despite the substantial contribution of the Sulu archipelago to this industry, challenges such as declining production due to genetic diversity loss and sea lice disease persist. Moreover, women engaged in seaweed farming often encounter gender disparities, hindering their opportunities and financial well-being. To comprehensively address these multifaceted issues, we propose a holistic approach. Firstly, we aim to enhance the production system by evaluating the viability of multiplier farms in sustainably supplying quality seedlings and testing the effectiveness of Kappaphycus extract or K-kap in improving seaweed production. Secondly, we will conduct a comprehensive socio-economic analysis, focusing on both traditional and multiplier farms, from a gender perspective to assess if the multiplier farm will improve gender inclusivity. We will establish multiplier farms in two major seaweed-producing municipalities of Tawi-Tawi to mass propagate laboratory-generated seaweed strains. Additionally, we will assess the cost-benefit of these farms to ensure sustainability. Furthermore, the multiplier farms will serve as a testing ground to evaluate the efficacy of Kappaphycus extract or K-kap as a sustainable alternative to conventional inorganic fertilizers. To gain a comprehensive understanding of the challenges, perspectives, and experiences within the seaweed farming sector, we will conduct interviews, key informant interviews (KIs), and focus group discussions (FGDs). We'll utilize a socio-economic questionnaire along with the Niche Framework and the Niche Analytical Framework for Gender Analysis. These methods will be applied in the regular seaweed farming communities and among participants in the multiplier farm project, ensuring equal representation of women and men farmers. Additionally, we will interview children who assist their families in seaweed farming. By integrating a gender perspective, our aim is to evaluate if the multiplier farm can enhance gender equity. This approach enables us to compare insights, identify commonalities, and analyze socio-economic dynamics and gender roles within the seaweed industry. It ensures that research findings represent diverse voices and perspectives within the community. Understanding these dynamics is crucial for shaping policies that promote the sustainable growth of the industry.<br><br>The sandfish species, <i>S. lemanu</i> , is an important food fish commodity and the management of its stock is a top priority. Part of the identified efforts to support resource management is the development of culture techniques that will allow the production of the species in a controlled environment. This project will entail numerous exploratory and experimental trials over a period of years and continuous funding for a successful development. As a critical venture, investigating its achievability is crucial to ensure that resources and efforts would not be wasted. Therefore, this feasibility study is proposed to do a comprehensive review of available resources on the successful conduct of breeding and rearing of sandfish, which will serve as the basis for the development of a hatchery program for <i>S. lemanu</i> in the country.<br><br>The project being proposed aims to expand a similar initiative in Region 10A, particularly in the multiplier farms, which is also a major activity of the coastal communities. Pre-selected fast-growing cultivars from PSU-MSL shall be utilized as seedstocks for the establishment of seaweed experimental plots in selected sites in Batangas. This is to mitigate the declining production of seaweeds in Batangas Province, identification of new farming sites could be one of the immediate solutions to augment the current scenario by using laboratory-reared cultivars from the branch and spore culture. The genetic variability in the newly generated seedstocks from spores is hypothesized to improve the quality of the cultivars. In addition, to have a successful introduction of seaweed farming among selected municipalities in the province, socio-economic profiling of the coastal communities will be implemented. This will determine the acceptability of the selected coastal communities of the introduction of seaweed farming as a possible alternative livelihood and source of income. | Publication: Papers in peer reviewed journals<br>Gender Perspectives in the Seaweed Value Chain: Insights from Seaweed Communities of the Sulu Archipelago<br>Sustainable Seaweed Production in Seaweed Farming: Lessons from Multiplier Farms<br>Enhancing Seaweed Yields with Kappaphycus cap (K-cap)/Crafting of an investment bulletin for the multiplier farm<br>K-cap production process/Protocol: K-cap use in seaweed farming<br>Disaggregated data of seaweed farmers in the Sulu archipelago<br>People: Trained the following:<br>Faculty<br>10 undergraduate students<br>10 researchers on GAD R&M-D and:<br><br>30 farmers on use of K-cap as fertilizer and best practices in seaweed farming<br>MOAs with MSU Sulu, LUGs, MAFAR and MENRE<br><br>Policy: Science-based information as results of the project that will serve as inputs in crafting policy related to seaweed farming  | Mindanao State University - Tawi-Tawi College of Technology and Oceanography (MSU-TCTO)      | Seaweed Farmers/Faculty and researchers/Students/MAFAR personnel/TESDA personnel/Provincial and Municipal Agricultural Offices   | 16-Aug-24 | 15-Aug-26 | ONGOING                          | 4,999,951          | 2,493,902.00     |
|               | Feasibility study on the captive breeding and rearing of Bali sardine ( <i>Sardinella lemuru</i> ) in the Philippines                               | Rapid, inclusive and sustained economic growth | The sandfish species, <i>S. lemanu</i> , is an important food fish commodity and the management of its stock is a top priority. Part of the identified efforts to support resource management is the development of culture techniques that will allow the production of the species in a controlled environment. This project will entail numerous exploratory and experimental trials over a period of years and continuous funding for a successful development. As a critical venture, investigating its achievability is crucial to ensure that resources and efforts would not be wasted. Therefore, this feasibility study is proposed to do a comprehensive review of available resources on the successful conduct of breeding and rearing of sandfish, which will serve as the basis for the development of a hatchery program for <i>S. lemanu</i> in the country.<br><br>The project being proposed aims to expand a similar initiative in Region 10A, particularly in the multiplier farms, which is also a major activity of the coastal communities. Pre-selected fast-growing cultivars from PSU-MSL shall be utilized as seedstocks for the establishment of seaweed experimental plots in selected sites in Batangas. This is to mitigate the declining production of seaweeds in Batangas Province, identification of new farming sites could be one of the immediate solutions to augment the current scenario by using laboratory-reared cultivars from the branch and spore culture. The genetic variability in the newly generated seedstocks from spores is hypothesized to improve the quality of the cultivars. In addition, to have a successful introduction of seaweed farming among selected municipalities in the province, socio-economic profiling of the coastal communities will be implemented. This will determine the acceptability of the selected coastal communities of the introduction of seaweed farming as a possible alternative livelihood and source of income.   | Publication: Patent: Product: People: Place: Policy   | Department of Agriculture - National Fisheries Research and Development Institute (DA-NFRDI) | The target beneficiaries are the fisherfolk and aquaculture operators who would benefit from the development of the seed production technology, the policy makers involved in sandfish stock management and lastly, the sardine industry as a whole.   | 01-Sep-24 | 28-Feb-25 | ONGOING                          | 1,360,000          | 1,360,000.00     |
|               | Field-testing of Laboratory-reared <i>Kappaphycus</i> and <i>Euchematium</i> spp. in Potential Farming Sites in Batangas Province (LIFEK-Project)   | Rapid, inclusive and sustained economic growth | The project being proposed aims to expand a similar initiative in Region 10A, particularly in the multiplier farms, which is also a major activity of the coastal communities. Pre-selected fast-growing cultivars from PSU-MSL shall be utilized as seedstocks for the establishment of seaweed experimental plots in selected sites in Batangas. This is to mitigate the declining production of seaweeds in Batangas Province, identification of new farming sites could be one of the immediate solutions to augment the current scenario by using laboratory-reared cultivars from the branch and spore culture. The genetic variability in the newly generated seedstocks from spores is hypothesized to improve the quality of the cultivars. In addition, to have a successful introduction of seaweed farming among selected municipalities in the province, socio-economic profiling of the coastal communities will be implemented. This will determine the acceptability of the selected coastal communities of the introduction of seaweed farming as a possible alternative livelihood and source of income.  | Publication: Two (2) research papers: local or international publication (peer-reviewed) EOC Materials (e.g. YouTube, vlog, etc.)<br>Product: One (1) biological database of laboratory-reared seaweeds One (1) KAP database/People: Three (3) Research Personnel At least four (4) coastal community-based laboratory/GU personnel/Place: One (1) MOA between Batangas State University and Palawan State University One (1) MOA between Batangas State University and four (4) coastal community/LUGs/Policy: N/A   | Batangas State University (BatState-U)   | Coastal communities in Lobo, Lian, San Luis, and Tingloy Local Government Units in Lobo, Lian, San Luis, and Tingloy   | 01-Jan-24 | 31-Dec-25 | ONGOING                          | 4,996,736          | 2,585,868.00     |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---------------|---|---|--|--|---|---|-----------|-----------|----------------------------------|--------------------|------------------|
|               | Fisheries and Reproductive Biology of the Gold-pearl Oyster <i>Pinctada maxima</i> (Jameson, 1901) in the Philippines   | Rapid, inclusive and sustained economic growth                            | Tagged as the pearl of the Orient, the Philippines is a traditional source of natural pearls from clams retrieved by Bajidos in early history. Due to the advancement of technology, various local companies have ventured into the culture of pearl oysters in some of the pristine waters of Palawan and Tawi-Tawi. The rapid increase in pearl production from farms has led to increased interest and research in its distribution, biology, reproduction, breeding, farming, and post-processing. Many decades ago, rich grounds of <i>P. maxima</i> were located in Sulu between the Philippines and the Indonesian Kalimantan Island (Borner, Strack 2008). Various studies on the stocks (Hart et al. 2016), morphology (Draga, 2017), and cultured marine pearl industry (Soudegate, 2007) in other countries have been conducted. However, similar studies focusing on family Pterididae in the Philippines are still lacking. The fishery of <i>P. maxima</i> is not properly documented, and there has not been an intensive report on the biology of this species. Without baseline information, no science-based policies and strategies for its conservation can be formulated. Thus, it is necessary and needs urgent augmentation to resolve research gaps and properly develop approaches to conserve the dwindling resource. This project will serve as a holistic picture of its fishery and its potential as a primary commodity in the country. Reproductive biology studies conducted in this study will serve as the basis for the closing and banning of the collection during the spawning months of <i>P. maxima</i> . It will also provide information that will serve as the basis for future researchers, specifically on the improvement of wild recruits, genetics, growth patterns, and stock enhancement programs required to replenish wild <i>P. maxima</i> stocks in the country.   | Products: One (1) Protocol for reproductive analysis of <i>P. maxima</i> Knowledge Products (Fisheries Profile Characterization of <i>Pinctada maxima</i> ) Publications: One (1) Scientific Publication (The fishery of <i>P. maxima</i> and Reproductive Biology of <i>P. maxima</i> ) People and Services: Three (3) Undergraduate and graduate students One (1) Trained personnel for biological processes/Phases and Partnerships: One (1) Partnership with SUG (MSU Tawi-Tawi) One (1) Potential partnership with study sites (Palawan and Guimaras) Policy: One (1) based information that may be inputted into policies or policy recommendations on the management and conservation of <i>Pinctada maxima</i> Social Impact: Provide an in-depth understanding of the fishery and reproductive biology of <i>P. maxima</i> that will aid in the formulation of protocols and policies to improve production and community involvement to better conserve and manage this resource. Economic Impact: The project will be offering techniques and protocols which will help improve the production of pearl oysters in the country. Potential improvement in the production will provide additional income to all members of the industry and may possibly provide jobs and develop more innovative and diversified business opportunities. | University of the Philippines Visayas (UPV) | (1) National Government Agencies Personnel (e.g. BFAR)(2) Local Government Units(3) Partnered Universities(4) Fisherfolk(5) Researchers   | 01-Aug-24 | 31-Jul-25 | ONGOING                          | 4,999,998          | 2,735,873.00     |
|               | Impacts of Marine Heatwaves in select West Philippine Sea Reefs   | Integrity of the environment and climate change adaptation and mitigation | This study is part of the program entitled Marine Heat Waves in the Western Pacific: Detection, Mechanisms and Their Impacts on the Coral Reef Ecosystems under the Asia Joint Research Program. The lead Principal Investigator (PI) is Dr. Susi Andjaja Wiratnayanti from Indonesia. He is an expert in remote sensing for observing sea surface temperature phenomena. The second PI is Prof. Toshiro Suga from Japan. His expertise in ocean dynamics made him trusted as the member of Aqua Steering Team, Global Ocean Observing System and IOC. He is experienced in terms of investigating the upper ocean heating in the global ocean. The third PI is Dr. Maria Vanessa Baria-Rodriguez from the Philippines, a coral reef ecologist and the proponent of this project.  | Information on the MHW occurrence in the western Pacific in broader-scale and finer-scale in the Philippines, Indonesia and Japan. Information on the mechanisms of MHW generation in the Philippines, Indonesia and Japan. Coral reef monitoring sites in West Philippine Reefs, Bali, Indonesia and Okinawa, Japan. Standardized coral bleaching monitoring protocol   | University of the Philippines Diliman (UPD) | Scientists and students (UPD MSI, Batangas State University, Diponegoro University, Tohoku University) and local stakeholders (LGU Bolinao and Anda, Pangasinan, Zamboanga, Batangas and Puerto Galera) and, NGAs (DENR and BFAR)   | 01-Nov-22 | 31-Oct-25 | ONGOING                          | 13,251,380         | 5,035,107.07     |
|               | Iron, Nickel, and Nitrate from Aerosol Deposition and their Influence on Growth and Toxin Production of Harmful Algal Bloom Species (IRON-HABS)               | Rapid, inclusive and sustained economic growth                            | The occurrence of harmful algal blooms (HABs) causes fisheries and stakeholder losses, poses health risks to consumers, and disrupts the ecological balance where it ensues. In Bolinao, Pangasinan alone, the financial losses due to fish kill are estimated to be PHP 21.9 million in May 2020 and PHP 107 million in June 2018. The most devastating loss happened in February 2002 with reported loss valued at PHP 500 million. The financial losses alone hinder the economic development of the coastal communities. The factors triggering the occurrence of HABs, Aspects of HAB formation and persistence have been brought into light by excellent research conducted by various groups in the country. Despite this, the complex nature of photosynthetic organisms and the delicate balance and interactions of multitude of factors, e.g. temperature, eutrophication, predominant phytoplankton taxa, and many more, present a field of unexplored research directions especially when the role of trace metals is considered. It is towards this specific knowledge gap where we intend to contribute in by focusing on the interactive effects of iron and nickel availability with nitrate concentration and how the interdependence of these factors dictate the growth and toxin production of two model HAB species namely <i>Pyrodinium bahamense</i> and <i>Alexandrium minutum</i> . Trace metals like iron, nickel, and zinc are required by photosynthetic organisms to act as reaction centers of different metal-containing enzymes pertinent in photosynthetic systems, electron transport cycle, DNA and RNA repair, nitrogen metabolism, and others. The availability of these trace metals for uptake by phytoplankton, i.e. model HAB species, will shape their growth and fitness in varying environmental conditions and in the case of HAB species, the toxin formation. A better understanding of trace metal effects and sources will contribute to unraveling the black box of factors shaping the recurrence of these blooms. | Publications: results will be used for publications (estimated 3) and for presentations in conferences (estimated 2-3) People and Services: support for graduate students and researchers (2 graduate students); short-term interns (about 2 per year); and visiting students/researchers (about 2 per year) Places and Partnerships: Strengthened collaboration with other HAB scientists (Research Collaboration Agreement with NFRDI) and community organizations in the Bolinao-Anda municipalities Policy: Come up with recommendations in drafting regulations pertaining to air pollution and aerosol quality improvement   | University of the Philippines Diliman (UPD) | The project will benefit various stakeholders from academic sector to communities living close to areas with persistent or intermittent occurrences of harmful algal blooms. The scientific community will benefit from new knowledge generated from the work as well as through increasing the number of researchers and scientists that will earn their degrees resulting from the research support provided by the project. The community in general will benefit by understanding the environmental factors contributing to the occurrence of harmful algal blooms in coastal areas that provide their main source of livelihood. | 01-May-24 | 30-Apr-26 | ONGOING                          | 9,792,496          | 5,708,098.00     |
|               | Jellyfish Ecology and Environmental Project (JEEP) Phase 2  | Rapid, inclusive and sustained economic growth                            | Box jellyfishes are the most lethal marine animal known. An estimated 200-400 people die of jellyfish stings every year in the Philippines. Jellyfish stings also have a significant impact, particularly on the tourism industry. The proposed JEEP Phase 2, described in this document, seeks to test specific hypotheses to improve our knowledge of the fine-scale distribution and seasonality of box jellyfish <i>Chironex yamaguchi</i> , and to continue the capacities of the men and women volunteers from the previous project. This information is essential in developing measures to minimize injury and avoid deaths due to envenomation by the animal.   | Publications: Posters, infographics, and social media postings to inform the public on safety precautions and first aid. Patent: N/A. Product: Profile of <i>C. yamaguchi</i> , DNA Barcodes, jellyfish monitoring protocol and risk management plan. People: Capacity-building for local citizens scientists to form a jellyfish monitoring team. People: MOU with host local governments to entail the participation of health and tourism officials. Policy: Policy advice on the management of box jellyfish risk and envenomation.  | De La Salle University (DSU)                | Coastal residents, tourists, Tourism operators, Fishers and their families  | 01-Dec-24 | 31-May-26 | ONGOING                          | 4,995,935          | 3,398,096.00     |
|               | Macronutrient, Carbon Cycling, and Aerosol Deposition: Impacts on Phytoplankton Community Structure and Toxin Production of Harmful Algal Blooms (Trace-HABS) | Integrity of the environment and climate change adaptation and mitigation | The project will look into the interactive effects of various growth factors (e.g., light intensity, temperature, macro- and micronutrient availability) on the occurrence and toxicity of <i>Alexandrium</i> and <i>Pyrodinium</i> blooms in two major sites: Bolinao in Pangasinan and Canababo Bay in Tacloban City. These areas are identified as study areas because harmful <i>Alexandrium</i> and <i>Pyrodinium</i> blooms have been reported in these sites where coastal communities also rely on fisheries as a major source of food and income. The project results are expected to benefit coastal communities in the study areas as well as the Philippine population, in general.  | Product: Knowledge/information regarding interactive effects of trace metals with other growth factors of HABs Database of macronutrient concentrations Module/training program for trace metal-defined algal cell culturing conditions People and Services: Trained personnel in metalomics and trace metal biogeochemistry (including all 3 research staff that will be hired during the project duration) On the job trainees/interns (about 5 per year) Addition to scientific workforce by graduating science majors (estimated 3 graduate students for the duration of the project) Publications: ISI-indexed publication (estimated 2-4 peer-reviewed articles for the duration of implementation) Papers in national and international conferences (estimated 1 per year) IEC materials: posters, proceedings Places and Partnerships: Established laboratories including (1) a laboratory equipped with facilities for trace metal-defined algal cultures (1) a core measurement facility for major nutrients Partnership with Academia Sinica Policy: Policy briefs on discharge of riverine and anthropogenic wastes especially those that are metal-containing Science-based information as input into the crafting of policies on the management of HAB   | University of the Philippines Diliman (UPD) | General Public, Coastal Communities, Academic/Scientific Community  | 01-Jun-20 | 31-May-24 | COMPLETED                        | 12,508,077         | 1,588,505.85     |
|               | Planting Sea Cucumber Fisheries Management through Species-Specific Size Regulation and Sustainable Trade in Selected Areas in Mindanao                       | Rapid, inclusive and sustained economic growth                            | Sea cucumbers provide livelihood and food to the economically deprived coastal families in Mindanao. However, this fishery is showing signs of overexploitation as catches are drifting from high to low medium and mostly low value species. A fisher can catch 1-7.2 kg/day of smaller sizes medium value to varied sizes low value species providing a take-home cash income of as low as PHP 70/fisher/day to as high as PHP 950 depending on species and sizes. The heavy exploitation is a result of unregulated harvesting because of limited management policies. Catch landings revealed that the low on size precautionary approach regulation for all sea cucumbers set by BFAR has not been strictly followed possibly due to economic pressure placed on the livelihood of the fishers. Moreover, on milder law enforcement implementation, specific management regulation at the LGU level is necessitated. This project is proposed to improve sea cucumber management to be initiated in two major sea cucumber fishing ground municipalities in Mindanao. This will be achieved by utilizing and translating the findings from Project 1 of the Sea Cucumber Rehabilitation into management initiatives such as the creation of an ordinance and a management plan focusing on the top three commercially collected species from each municipality. Moreover, the project will continue to conduct basic research involving fishers as inputs to create strong and effective management policies for other commercial species and for policy recommendation at the national level. By providing a venue for management implementation of the top three commercial sea cucumbers at the LGU level, the gatherers will be informed and will adhere to newly created local ordinance that regulates harvesting leading to a sustained sea cucumber resource and their livelihood.  | Publication: Two papers/posters presented in scientific fora Two papers submitted for publication in scientific journals Patent: N/A. Product: N/A. People: Trained 40 local sea cucumber fishers/gatherers on line transect survey (20 individuals from each LGU). Supported two thesis students. Phase 4 MDA (2 LGUs), 2 Regional BFAR offices. Policy: 2 ordinances 2 management plans  | Mindanao State University (MSU-Naawan)      | Sea cucumber gatherers/fishers and processors, LGUs, BFAR, thesis students  | 01-Jan-24 | 31-Dec-25 | ONGOING                          | 4,991,154          | 2,535,844.00     |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---------------|--|--|---|---|--|---|-----------|-----------|----------------------------------|--------------------|------------------|
|               | Population Genetics and Molecular Characterization of Pearl and Other Commercially Important Oysters Using Mitogen DNA Analysis  | Rapid, inclusive and sustained economic growth | The Philippines boasts a remarkable diversity of oysters, including pearl and winged oysters (Pinctada spp. and Perna spp.) and various commercially important oyster families including tree oysters (Pteropromadae), hammer oysters (Malleidae), windowpane and saddle oysters (Pisumidae), and thorny oysters (Spondyliidae). This project proposes a comprehensive investigation of these bivalves, employing molecular characterization and population genetics using multigene DNA analysis. Species characterization and population genetics are fundamental for understanding and managing natural populations. These techniques can also be applied to explore the potential for aquaculture of these bivalve species. Species Characterization/Accurate identification of species is crucial as many oyster bivalves share subtle physical similarities. DNA analysis provides a reliable method to distinguish them, enabling targeted conservation efforts for vulnerable species and their habitats. This knowledge also informs fisheries management by allowing for regulations specific to commercially valuable species, preventing overfishing. Furthermore, aquaculture benefits from the precise identification, as selecting the right species with desirable traits like fast growth or disease resistance becomes possible. Population Genetics: Population genetics delves deeper into analyzing the genetic variation within oyster populations. High genetic diversity indicates a healthy population with resilience to environmental changes and diseases. Conversely, low diversity suggests a population bottleneck, a genetic reduction in numbers, making them more vulnerable. Studying genetic similarities between geographically separated populations reveals their evolutionary interactions. This informs management strategies, determining if local protection or a broader approach is necessary. Additionally, it aids in environmental impact assessments, helping us understand how human activities like pollution might affect gene flow between populations. Finally, genetic data sheds light on a population's potential ability to adapt to changing environments like rising temperatures or ocean acidification. This information is crucial for predicting future population health and implementing effective conservation measures. | End of the Report Output/Publications: at least 2 ISI-indexed publications: (1) molecular characterization and (2) population genetics of pearl and other commercially important species based on multigene DNA analysis; (1) Field Guide on Philippine pearl oysters and other commercially important oysters; (1) Oyster multigene DNA analysis Manual: sample collection, DNA extraction, amplification and data analysis; (1) Intellectual Property rights for the data to be cited coming from the project once deposited in public database; (1) Product: (1) DNA sequence for species level identification of oyster specimens; (1) showing the population structure based on genetic data of pearl and other commercially important oysters; (1) People and Services: (1) Personnel trained in molecular genetics methods and analyses, including faculty and students at other IGFST sites and partner IGFSTs; (1) 2 holding seminars and workshops (morphological-molecular characterization and population genetics); (1) 4 undergraduate/graduate students; (1) Places and Partnerships: (1) Establish a shared-use molecular genetics laboratory for graduate students and other researchers; (1) Partnerships with SUCs and LGUs and People Organizations; (1) oyster fisherfolk associations; (1) Collaboration between local communities, pearl and other farmers and the research team; (1) research and extension information that can serve as input for policy recommendations for the conservation, sustainability and management pearl and commercially important oyster species; (1) research; (1) community engagement and awareness; (1) Policy and Advocacy; (1) Economic Impact; (1) Sustainable Oyster Management; (1) Diversified and Enhanced Livelihoods   | Iloilo State University of Fisheries Science and Technology (ISUFST)             | Local fisherfolk, fisheries managers, resource planners (from LGUs, DENR, BFAR, and people's organizations), academics, and researchers (local and global), contributing to improved oyster management and sustainability.  | 01-Aug-24 | 31-Jul-26 | ONGOING                          | 5,000,000          | 3,684,476.00     |
|               | Prevalence and Genetic Diversity of Cetacean morbillivirus (CeMV) in Cetaceans Stranded in the Philippines   | Rapid, inclusive and sustained economic growth | The project generally aims to screen cetaceans in the Philippines for cetacean morbillivirus (CeMV) and investigate the genetic diversity of CeMV strains found in the country's straits in comparison to those found worldwide based on deposited genetic sequences in international databases. The expected findings have significant implications for the conservation and management work in the Philippines, which is a hotspot for marine mammal diversity in the region. Tissue samples will be collected during stranding events in collaboration with the Philippine Marine Mammal Stranding Network (PMMNS) and Bureau of Fisheries and Aquatic Resources (BFAR), Department of Agriculture. CeMV and its infection will be detected and characterized through molecular methods, histopathology, and microscopy. The project will enable (1) capacity building of Filipino veterinarians as frontline responders and sample collection and handling involving the detection of viral diseases of marine mammals in Philippines; (2) improved standing databases and tissue collection for cetacean response, the first of its kind in the Philippines; and (3) upgrading of practices in stranding response and sample collection and handling involving the detection of viral diseases of marine mammals in Philippines. The project will benefit for marine mammals, charismatic sentinels whose migration and habitat ranges are not limited by geographical boundaries.   | Publications: Publication of manuscripts (2); Oral/poster paper presentations in a national/international scientific conference (2) Patents: Developed/optimized method for CeMV detection (possible patent) Products: Manual on collection and transport of tissues Marine mammal repository (cetacean tissues and genetic material) People and Services: At least 10 government veterinarians (DA-BFAR) trained on advanced medical management of stranded cetaceans for detecting viral diseases/pathogens At least 5 Filipino research associates and graduate students trained on protocols and assays used in the study Places: Partnerships: Bureau of Fisheries and Aquatic Resources (BFAR), Department of Agriculture (DA) Philippine Marine Mammal Stranding Network (PMMNS) Asian Marine Mammal Stranding Network (AMMSN) LGUs in stranding sites Policy: The project will come up with a green paper (for crafting of policy) presenting findings and course of action on the rehabilitation and medical management of stranded cetaceans with CeMV infection and other infectious diseases. Specifically, it will consider: (1) availability of resources; (2) disease severity and prognosis; (3) practicality of continuing with rehabilitation   | University of the Philippines Diliman (UPD)                                      | Researchers (e.g., microbiologists, geneticists) and government agencies (DOH, DOST) that will be needing access to upgraded marine mammal tissue repository. City and provincial veterinarians under BFAR or LGUs and Filipino and graduate students that will use the training manual and will attend the workshop on advanced medical management of stranded cetaceans for detecting viral diseases/pathogens. City and provincial veterinarians under BFAR or LGUs and members of PMMNS, and AMMSN that will use the manual detailing the protocol for collection of biological specimens from marine mammals during stranding events as well as local and international transport of tissues for sharing of expertise and practices in the Asian region. Researchers, Department of Health (DOH), and Department of Science and Technology (DOST) that will use the developed method for monitoring CeMV in Philippine waters. | 01-Apr-24 | 31-Mar-26 | ONGOING                          | 5,000,000          | 3,703,165.00     |
|               | Reef Imaging and Monitoring (RIM) Project  | Rapid, inclusive and sustained economic growth | Despite a marked decline in the condition of Philippine reefs over the last decade, there is still no nationally coordinated reef monitoring effort and no monitoring data (defined by the Global Coral Reef Monitoring Network as data spanning at least 15 years) from the Philippines. A lack of standardized field methodologies and trained personnel remain major barriers to such an effort. The present proposal aims to address these issues through the development of standardized field methodologies for reef monitoring, focusing on the use of advanced photogrammetry techniques for individual corals and fixed plots. These techniques will reduce the costs and time required to conduct fieldwork while producing permanent, verifiable, image-based data on a greater number of parameters, including hard coral cover and diversity, rugosity, and coral sizes.   | Publications: Reports for the assessment and monitoring of coral reefs, 3D ortho-mosaics of fixed plots in Lan, Palawan and grounding sites in Tubatuba Reef, Palau Park Products: Updated protocols for the assessment and monitoring of coral reefs Places and Partnerships: The proposed project will form part of the ongoing and continuing collaboration on reef monitoring between DLSU and the local government of Lan, and the Tubatuba Management Office on reef monitoring.  | De La Salle University (DLSU)  | Field personnel of academic institutions and national and local government agencies involved in reef monitoring, coastal management, and marine conservation.   | 16-Jan-24 | 31-Mar-25 | ONGOING                          | 4,999,948          | 4,999,948.00     |
|               | Refinement and pilot testing of technology for the White Teatfish Holothuria fuscogilva (Cherbonnier 1980) hatchery for sustainable production and adaptive management | Rapid, inclusive and sustained economic growth | This project was born out of NICER Sea Cucumber R & D Center Project 3's implementation at Mindanao State University at Naawan, which was titled "Development on Mariculture Technology and Stock Enhancement Protocol for the White Teatfish Holothuria fuscogilva (Cherbonnier 1980)" from July 15, 2018, to June 30, 2022. During the 4-year implementation, the stages between fertilized eggs and larval rearing of the H. fuscogilva were observed to have a very poor survival rate, and it was considered as one of the bottlenecks in the hatchery of this species. Nevertheless, the effort was successful in producing H. fuscogilva with some juveniles have been released in the natural habitat of Lagundingan, Maramba Oriental and Rizal, Zamboanga del Norte, which are the sources of breeders. Overall, there is still a significant need to improve the H. fuscogilva hatchery protocol, as well as the establishment of a protocol for the species' grow-out production. Another stumbling block of the production is the unreliability of synchronous spawning occurrences of male and female breeders during induced spawning at the hatchery resulting for the eggs to be unfertilized. As a result, this research will help to improve and refine the hatchery protocol for H. fuscogilva juvenile production for stock enhancement and grow-out production for income generation of the selected localities in Mindanao.  | Publications: Three technical papers presented in scientific forums and Three submitted in Scopas/ISI Publication Patent: 1 IP Disclosure Product: Production of Holothuria fuscogilva juveniles and adults People: Trained 4 collaborators and at least 2 local assistants in each implementation sites for the site breeding activity, assist six students (1 PhD, 3 MS, 1 BS) on the conduct of their theses/dissertation related to the project Place: Engagement of collaborators, MOA with three LGUs and BFAR and XPI/PLI Science & Technology based information that will input into policy or guidelines for conservation and management of H. fuscogilva  | Mindanao State University (MSU- Naawan)  | This is a science-based project which aims sustainability and food security for the benefits of various stakeholders. Fisherfolk and people's organizations Local government units Academic and research institutions Researchers and students  | 01-Jan-24 | 31-Dec-25 | ONGOING                          | 4,992,786          | 2,450,425.00     |
|               | Reproductive Biology and Product Development in Rainbow Sardines, <i>Dussumieria</i> sp. (Teleostei: Clupeidae) from selected Marine Habitats in Western Visayas       | Rapid, inclusive and sustained economic growth | The three-year project aims to re-evaluate existing information on the reproductive biology of rainbow sardines, <i>Dussumieria</i> spp. to support fish conservation efforts by the local coastal cities and municipalities bordering Iloilo Strait and the Visayan Sea. This project also aims to develop new food and pharmaceutical products with rainbow sardines as the main ingredient to efficiently used the fish resources in the region. Specifically, this project will (1) characterize gonadal development stages of the rainbow sardines based on histological observations; (2) describe the annual and cellular gonadal cycle of the said species; (3) characterize the size and age at maturity, sex ratio, fecundity, and other relevant reproductive parameters; (4) develop food and pharmaceutical products out of rainbow sardines; and (5) engage local communities to produce high quality sardine products (Spanish style rainbow sardine and sardine candies) by establishing standard analytical tests for quality assurance including microbiological, biochemical and sensory evaluation protocols. The expected outputs include publication, patent, product, people service, place and partnership, and policy. The expected benefits include marginal fisher folks, local government units, government agencies, fish consumers, and businesses. This project will also fill the knowledge gap on rainbow sardines in terms of reproduction, management of its fishery stocks, and seed production protocols. Moreover, as one of the main fish stock assets in the Philippines, the rainbow sardines potential as a source of high-value products remain untapped. Innovation on product and quality testing is also needed to highlight its role in the future food security and resource sustainability. development of innovative food and pharmaceutical products from the rainbow sardine must be prioritized.   | Publications: Scopus or ISI-indexed publication: At least one (1) research article on the reproductive biology of rainbow sardines and one (1) research article on product development. For the reproductive biology of rainbow sardines, the research article will include gonadal development and maturation stages, seasonal and lunar gonadal cycles, minimum body size at maturity, sex ratio, fecundity, and length-weight relationships. For product development, this will include protocols, chemical analyses of products, and the products themselves. IEC materials such as 100 copies of information bulletin on the reproductive biology of rainbow sardines; 300 technoguides in preparing food products out of rainbow sardines, instructional or training materials and modules; in extraction of protein hydrolysates and oils from rainbow sardines; 2 videos uploaded thru various social media platforms for promoting conservation and efficient use of products out of the rainbow sardines Patent: 1 patent applications of food products with rainbow sardines as the main ingredient; 2 utility models on oil, protein hydrolysates and oils extracted from the rainbow sardines; Product: 2 food products out of the rainbow sardines 2 pharmaceutical products out of the rainbow sardines People: 1 training seminar on the fish conservation strategy for rainbow sardines 1 training seminar on the extraction of protein hydrolysates and oils from the rainbow sardines 2 M.Sc./Ph.D. degree holders through the project Place: 1 partner institution (NONESCOST) 1 collaborating partners (BFAR, CAPSUL, NISU, ISUFST, and SEAFDEC/ACD) 5 project sites (Olon, Tigbauan, Roxas City, Carles, and Sagay City) 1 Memorandum of Agreement (MOA) signed among stakeholders, involved in the project 1 Research Funding Agreement (RFA) signed among stakeholders of the project Policy: 1 regional science-based policy recommended for adoption by the LGUs and fisherfolks on fish conservation and product development out of the rainbow sardines | West Visayas State University (WVSU), State University of Northern Negros (SUNN) | Fisherfolks in various coastal communities Local Government Units (LGUs) where the project will be implemented Government Agencies such as BFAR, B, NEDA, and DTI State Universities and Colleges involved in the project Consortium members of WESVAARDEC Faculty/researchers of CMIs involved in the project Entrepreneurs, interested in commercializing food and pharmaceutical products out of the rainbow sardines  | 01-Mar-24 | 28-Feb-27 | ONGOING                          | 4,981,850          | 1,813,050.00     |
|               | Reproductive Development and Early Life Growth of <i>Sardinella gibbosa</i> in the Visayan Sea   | Rapid, inclusive and sustained economic growth | <i>Sardinella gibbosa</i> , the dominant sardine species in the Visayan Sea, is heavily-fished from late larval (ry) to adult stages. The stock appears to be made up entirely of fish younger than 2-years, making the fishery increasingly vulnerable to collapse in years with poor recruitment. This is a major concern for the region in the light of global changes in climate. While the BFAR-NSAP studies are regularly conducted in the region, these do not cover the fy fisherfolk nor do they include determining otolith-based aging and fecundity/egg morphology. The proposed study aims to cover these aspects to complement existing efforts and provide more comprehensive scientific bases for managing the fishery.   | Publications: presentations in 2 conferences, technical reports, 4 publications Products: Critical habitats of early and other life stages of sardines in the Visayan Sea People: Information on fishery monitoring scheme; map of fishery operations; validation of length-based growth models; age & growth histories of subadults; life cycle and otolith 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; BSMS students; OJTs & SAs Places and Partnerships: Partnerships w/ LGUs, BFAR-NSAP teams & NFRDI Policies: Scientific and technical information for policy-making bodies of the FM and national levels; strategic inputs to the National Sardine Management Plan   | University of the Philippines Visayas (UPV)                                      | Local commercial and municipal fisheries sector Fisheries Stakeholders & consumers Regional BFAR & NSAP Academe   | 01-Mar-20 | 31-Aug-22 | COMPLETED                        | 4,999,566          | 620,175.96       |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---------------|---|---|---|--|--|--|-----------|-----------|----------------------------------|--------------------|------------------|
|               | Seaweed Waste Biomass from the Carrageenan Industry (SWBC) as Phyco-biofertilizants                                       | Integrity of the environment and climate change adaptation and mitigation | Kappaphycus and Eucheuma species are commercially being exploited to produce carrageenan, a phytycolloid typically employed as a direct food additive (GRAS) by USFDA and FAO-JECCA. They are commercially cultivated species in the Philippines providing significant and sustainable livelihood especially in coastal communities. Numerous scientific industry-driven applications of carrageenan are highly-recognized in various fields of aquaculture, agriculture and environment. Fuel, material science, human and health, and nutrition which are tangible solutions in satisfying the UNDP Sustainable Development Goals or Global Goals by 2030. The increasing worldwide demand for Kappaphycus and Eucheuma species and carrageenan has resulted not only in the expansion of culture sites, but also in the increased seaweed biomass waste from industrial carrageenan manufacturing plants. For instance, the extraction of refined carrageenan (RC) leaves seaweed waste biomass (SWBC) that are usually disposed of, generating about 60-70% based on the seaweed initial dry weight. It is presumed that SWBC in different types of carrageenan (e.g., kappa, lambda, and nu) are composed of different types of carbohydrates usually in the form of fibers, pectin substances, floridan starch, poly and oligosaccharides which can be used not only as feedstock for fuel production but also as source of bioactive components promoting plant growth, thus increasing crop yields and quality.<br><br>This research would like to explore the potential of a seaweed biorefinery concept integration, which considers the use of SWBC for biofertilizant production. The application of SWBC in Kappaphycus micropropagation and field cultivation is introduced, which may provide significant contributions toward the development of seaweed waste-derived fertilizer products, and advancement in the cultivation and processing steps along the value chain for the sustainability of the carrageenophyte industry. SMART-Corals project adopts a programmatic approach to improve resilience of Apo Reef National Park. The study focuses on four key areas: coral reef monitoring of the reef complex; coral reef fish recruitment studies; identification of important functional groups; and the patch scale rehabilitation of selected sections of ARNP. The goal is to generate empirical information to address data gaps and aid in the formulation of a strong science-based management plan for the reef complex. Historical data in ARNP reports changes in benthic and reef fish community structure. Using data from 2017 and from SMART-Corals surveys, this project aims to continue the monitoring program to further elucidate factors that prevent phase shifts in ARNP. The project aims to aid surveys targeting coral and reef fish recruitment, crown-of-thorns starfish population connectivity, and functional group identification assessment. Coral reef resilience pertains to the importance of minimizing large scale disturbance drivers, recruitment, and herbivory, particularly in offshore reefs, hence their inclusion in the monitoring program is critical. Climate-driven disturbances impacted the reef complex. In ARNP long term data showed that the frequency of large-scale disturbances occur at intervals, shorter than what is required for recovery. Loose substrate coverage increased after major storm events in certain areas of ARNP. It is critical that assisted rehabilitation must be implemented in sections of the reef where it is needed with a high probability of successful binding and colonization. SMART-Corals provided initial data necessary to support scaling up of the rubble stabilization in a high-energy reef. The project aims to further develop local expertise through training and collaborative output. An important undertaking in the project is the Citizen Science training of MA managers in Sablayan. This was identified during the roundtable discussion conducted under the previous project. | Publication- Expected Publications "No total of 1: Year 2: Growth-promoting potential of SWBC in alvarezii. Biochemical profiles and nutrient composition of SWBC<br>Paper: None/Produced. Non-People: People and Services: Year 1: 1 undergraduate student supported<br>Year 2: 1 undergraduate and 1 MS student supported; dissemination of improved methodologies (e.g., application of extracts from SWBC) in field cultivation of Kappaphycus to seaweed farmers/Place: Partnerships: Years 1, 2-3 Collaborations: probably with 1-2 seaweed farmers associations, 1 seaweed processing industry partner (Shembree Marketing Corp., Marcell Trading Corp. Palay, Iloilo)  | University of the Philippines Visayas (UPV)    | Seaweed farmers / coastal communities<br>Seaweed processing industry, "no adequate supply of raw materials and continuity of supply chain assures stable/ continued commercialization, both for domestic and export demand; promotion of "k-zero-waste," in the process of carrageenan production<br>Researchers in seaweed ecophysiology and aquaculture "no Through these studies, innovative approaches in production and propagation of Kappaphycus in Philippine waters may be developed to further increase seaweed production amid the challenges brought about by global climate change. Findings from this research could also be used to support projects for funding studies on the application of extracts from SWBC as innovative farming strategy for other cultivated seaweed species of commercial interest (e.g., Asparagopsis, Porphyra, Halymenia, Gracilaria, Sargassum, Gelidium). This study could likewise stimulate researches on new methods of extraction or production of untapped seaweed metabolites for their value-added potential. | 16-Jan-24 | 15-Jan-26 | ONGOING                          | 5,000,000          | 1,291,124.00     |
|               | Spatio-temporal Monitoring and Rehabilitation Technology for the Enhanced Recovery of Coral Reefs (SMART-Corals)          | Rapid, inclusive and sustained economic growth                            | SMART-Corals project adopts a programmatic approach to improve resilience of Apo Reef National Park. The study focuses on four key areas: coral reef monitoring of the reef complex; coral reef fish recruitment studies; identification of important functional groups; and the patch scale rehabilitation of selected sections of ARNP. The goal is to generate empirical information to address data gaps and aid in the formulation of a strong science-based management plan for the reef complex. Historical data in ARNP reports changes in benthic and reef fish community structure. Using data from 2017 and from SMART-Corals surveys, this project aims to continue the monitoring program to further elucidate factors that prevent phase shifts in ARNP. The project aims to aid surveys targeting coral and reef fish recruitment, crown-of-thorns starfish population connectivity, and functional group identification assessment. Coral reef resilience pertains to the importance of minimizing large scale disturbance drivers, recruitment, and herbivory, particularly in offshore reefs, hence their inclusion in the monitoring program is critical. Climate-driven disturbances impacted the reef complex. In ARNP long term data showed that the frequency of large-scale disturbances occur at intervals, shorter than what is required for recovery. Loose substrate coverage increased after major storm events in certain areas of ARNP. It is critical that assisted rehabilitation must be implemented in sections of the reef where it is needed with a high probability of successful binding and colonization. SMART-Corals provided initial data necessary to support scaling up of the rubble stabilization in a high-energy reef. The project aims to further develop local expertise through training and collaborative output. An important undertaking in the project is the Citizen Science training of MA managers in Sablayan. This was identified during the roundtable discussion conducted under the previous project.   | ARNP ecology, particularly processes that contribute to stability, resilience, and recovery.<br><br>Genetic structure of COI population to help managers to understand future outbreaks.<br><br>Capacitated personnel and volunteers on coral reef community monitoring and restoration work to help ARNP-PAMO and other stakeholders in monitoring the reef complex.<br><br>Production of a habitat map with a minimum of four classes (i.e., live coral dominated, dead coral with algae, sand, rubble) and with an overall accuracy of no less than 80%, to be used in change detection and spatial planning.<br><br>The production of an ARNP ecosystem vulnerability model to show sections of ARNP that are most vulnerable to disturbance and those that have the highest potential for recovery.<br><br>Establishment of a coral rehabilitation pilot site to showcase the technology used in coral rehabilitation.<br><br>BS and MS graduates specializing on coral reef ecology and coral restoration.   | University of the Philippines Los Baños (UPLB) | Managing bodies ARNP PAMO/ENRO Fishing community of Sablayan and neighboring municipalities<br>Tourism sector of Sablayan<br>SUCs and Hells  | 16-Jan-23 | 15-Jan-26 | ONGOING                          | 19,906,775         | 6,044,283.20     |
|               | Species Distribution, Abundance, and Ecology of Pearl Oysters (Pteriidae) of the Philippines                              | Rapid, inclusive and sustained economic growth                            | Massive mortality, degenerating pearl quality, and threats of climate change impacts are the pressing problems of the pearling industry in the Philippines. To address this, comprehensive information on the diversity, biology, and ecology of pearl oysters in the Philippines has to be investigated. This study will survey and identify the species of pearl oysters present in the Philippines. Their abundance, size, and density will be determined to check for the sustainability of stocks. Habitat types through benthic life forms, benthic rugosity, and water physico-chemical parameters will also be studied. These will address the pearling industry's need for information on sources of quality broodstocks and will serve as basis for management of its fisheries and for possible establishment of marine protected areas.   | Publications—1 peer reviewed publication/Products/1 map of pearl oyster species distribution and habitat in 3 selected sites/People and Services/62 Research Assistants trained on pearl oyster taxonomy and habitat characterization/1-2 MSc graduates/undergraduate trained on pearl oyster taxonomy and habitat characterization/62 Project Staff trained on pearl oyster taxonomy and habitat characterization/2 Field Assistants or Project Staff trained on pearl oyster taxonomy and habitat characterization/Partnerships/66Collaboration/Partnerships through MOU with 1) MSU-Tawi-Tawi as on-researcher and coordinator for FGD and KII and 2) NSD (Palawan) as LCU and stakeholders coordinator for FGD and KII/Polices/6581 based information that will input into possible policies, guidelines or policy recommendations on the fisheries management and stock sustainability of pearl oysters in sampling sites/Social Impact/6A participatory-based management involving all the capacitated stakeholders is projected resulting to well-equipped and knowledgeable stakeholders on sustainable fishing/farming practices thus sustaining, improving, and/or creating more livelihoods for Philippine pearling industry/Economic Impact/6The development of protocols and techniques will result to the improvement of the pearl oyster production, promotion of investments in product development, strengthening the hold of current markets and exploration/diversification to new markets.   | University of the Philippines Visayas (UPV)    | 6Small-scale fisher/6Pearl farm industry/6Shellcraft industry/6Aquaculture industry/6LGUs, BFAR, DENR, NGOs  | 01-May-24 | 30-Apr-26 | ONGOING                          | 4,990,047          | 2,711,895.00     |
|               | Value Chain Analysis of Pearl Oyster (Pteriidae) Towards Sustainable and Competitive Pearling Industry in the Philippines | Rapid, inclusive and sustained economic growth                            | Pearl oyster farming is considered as one of the most valuable aquaculture activities in the Philippines. From a small-scale maritime enterprise, it has now evolved into a multi-million-dollar industry which primarily exports the gold- or silver-tip pearl oyster Pinctada maxima in Japan, Hong Kong, United States, Australia, and Switzerland among others. Other pearl oyster species cultured in the country are Pteria peripart (Imada and P. margaritara (Babcock) (Kawan 2000). In 2018, the Philippines has exported total volume of 2,00 kg net weight of pearls amounting to US\$15.3 million while trade value from importing countries (i.e. Japan, Hong Kong, United Kingdom) totaled to US\$10.0 million comprising 65 kg of cultured and natural pearls (UN Comtrade 2018, ITC Trademap 2018). This research proposal will assess the performance of the pearl oyster industry in the Philippines using the Value Chain Framework. Through this framework, the movement of the product, from input supply, production, post-harvest, trade, and market will be characterized. Data will be collected through primary (focus group discussions, key informant interviews, and validation workshop that is well represented by stakeholders on all nodes across the value chain) and secondary data (e.g., Philippine Statistics Authority, Bureau of Fisheries and Aquatic Resources, Local Government Units). The governance and socio-economic dimensions will be integrated with ecological measurements through different fisheries performance indicators. This will give a clear picture of the level of sustainability of the commodity, the resilience of the value chain, and information, which is vital in decision-making. Chain Performance Analysis will be used to evaluate the performance of existing supply-value chain in the pearl oyster industry (i.e., efficiency, flexibility, overall responsiveness). Analyzing the chain would uncover the root causes of the problems that will be utilized in the development of intervention modes. A final validation workshop will be conducted to allow the stakeholders as well as policymakers to choose the best option/s for an effective fisheries management and sustained pearling industry in the Philippines.   | Products/6Value chain map of Philippine pearling industry/6One (1) training module for pearl oyster key stakeholders produced in three (3) different local languages/dialects/Publication/6One (1) ISI publication/People and Services/6A) least four project personnel (includes early career researchers, graduate, and undergraduate) will be trained on quantitative and qualitative research using value chains, SWOT, and root cause analyses/Places and Partnership/66Partnership with the pearl oyster industry, research and academic institutions, government (LGUs, NGOs) through MOU/Info/6Partners/6Two (2) copyright of value chain maps developed, including training module and/or policy briefs/Policy/66581 based information that will input into policies or guidelines for all stakeholders across the pearl oyster value chain that is focused on human well-being, good governance, and stock sustainability of the pearl oysters/Social Impact/6Assessment of the Philippine pearling industry through fisheries value chain that will help build and integrate co-management and participatory approaches, improving human well-being and their capacities needed for the promotion of sustainability and good governance/Economic Impact/6The identification of the strengths and gaps in the Philippine pearl oyster industry and the creation of a value chain map that will serve as a baseline to develop programs and policies that will increase value and volume production as well as global market share of Philippine pearling industry. | University of the Philippines Visayas (UPV)    | 1. Stakeholders<br>a. Input suppliers<br>b. Pearl oyster farm operators;<br>workers: small-scale divers/fishers<br>c. Pearl oyster processors and processing companies<br>d. Pearl oyster traders, distributors, and exporters/2. Local communities within pearl oyster farm sites/3. Enabling environment (e.g., NGAs, RIs, academe) and supporting markets   | 01-May-24 | 30-Apr-26 | ONGOING                          | 5,000,000          | 2,859,940.00     |
|               | VISMO: Visayan Sea Model for Operational Oceanography   | Integrity of the environment and climate change adaptation and mitigation | In the Visayan Sea, despite the decreasing catch, the potential for fisheries remains because of its seemingly naturally productive waters. The reason for the high productivity is not clear. Time series of fish catch per unit effort (CPUE) data do show correlations with environmental variables, particularly sea surface temperature (SST), wind speed and net primary productivity (Basal et al., 2022). However, it is recognized that the mechanisms involved in the relationship between fisheries and environmental variability in the Visayan Sea remain unexplored.<br><br>This study will attempt to characterize the circulation in the Visayan Sea and the drivers of both the observed high net primary productivity and fisheries productivity. It is very timely understanding the processes in the Visayan Sea involves its interaction with the neighboring basins in the Visayas and examination of the neighboring basins is also a crucial part of the study. An explanation of the processes contributing to the natural productivity of the Visayan Sea is an important input towards an ecosystem-based management of marine resources.  | 1. Publications<br><br>(3) Three Research Articles/Journal Publications<br><br>2. Product (3 Knowledge Products)<br><br>A website providing near-real-time high-resolution ocean current maps of the Visayan Sea from Structured and Unstructured Grid Reconstructable Ocean (SURF-NEMO) output<br><br>3. People and Services<br><br>(2) Personnel trained in using DELFT3D and SURF-NEMO modeling<br><br>4. Places and Partnerships<br><br>Research collaboration with UPV and BFAR<br><br>5. Policy<br><br>Science-based information that will serve as inputs   | University of the Philippines Diliman (UPD)    | BFAR and SUC's who need surface current maps and productivity information for maritime enforcement, oceanographic research and fisheries management.   | 01-Jul-23 | 30-Jun-25 | ONGOING                          | 4,999,368          | 1,111,092.00     |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---|--|---|--|--|---|---|-----------|-----------|----------------------------------|--------------------|------------------|
| Attaining sustainability in the fisheries for sardines and other small pelagic fish off the Zamboanga Peninsula (v. 2021) | Proj. 3. Spatial patterns in the fisheries for sardines, their fry, and associated small pelagic fish off the Zamboanga Peninsula  | Integrity of the environment and climate change adaptation and mitigation | The program builds on the results of the first phase of investigations of the Zamboanga Upwelling System and the fisheries it supports, and seeks to provide answers to the major questions arising from these results, particularly those concerning maturity, spawning, early stage growth and recruitment, the fry fisheries, and the role of sardines as a key species in the trophic structure of the ecosystem and how its fisheries affects associated small pelagic stocks. In addition, the new studies cover the entire Zamboanga Peninsula (East Sulu Sea) to examine more closely the coupling of North and South Zamboanga, as suggested by the results of previous studies.  | Baseline information on the composition, distribution, abundance of fry caught by various gear types will be established and will be used to polish the existing FAO of the sardines fishery in Zamboanga Peninsula. Evaluating changes of sardine fry will be determined, as well as issues involved can be addressed. Options for interventions in flow of material from fisheries to market. Ecologically important areas for different life stages of the small pelagic resources are determined and will be used to polish the existing FAO of the sardines fishing ban in Zamboanga Peninsula  | Jose Rizal Memorial State University (JRMSU)  | Local commercial and municipal fisheries sector, fisheries stakeholder and consumers, regional BFAR and NSAP, and academe   | 01-Apr-22 | 31-Mar-25 | ONGOING                          | 11,484,492         | 2,785,888.40     |
| Attaining sustainability in the fisheries for sardines and other small pelagic fish off the Zamboanga Peninsula (v. 2021) | Proj. 1 Early Life Dynamics and Reproductive Capacity of Sardinelemuru and Associated Small Pelagic Fish off the Zamboanga Peninsula (Life history, recruitment and trophic role of Sardinelemuru off the Zamboanga Peninsula) | Rapid, inclusive and sustained economic growth                            | The program builds on the results of the first phase of investigations of the Zamboanga Upwelling System and the fisheries it supports, and seeks to provide answers to the major questions arising from these results, particularly those concerning maturity, spawning, early stage growth and recruitment, the fry fisheries, and the role of sardines as a key species in the trophic structure of the ecosystem and how its fisheries affects associated small pelagic stocks. In addition, the new studies cover the entire Zamboanga Peninsula (East Sulu Sea) to examine more closely the coupling of North and South Zamboanga, as suggested by the results of previous studies.  | 1. Science-based harvest control reference points for the dominant species of sardines and key small pelagic species off the Zamboanga peninsula—Evaluation of length-based growth modes (vs. age based) and applications to management of other stocks in the country—MS Biology/Fisheries graduate specializing on sardine population biology—Research staff with expertise on fisheries biology and management—Enhanced understanding of the reproductive capacity of the stock as basis for management—Management scenario options for the small pelagic fisheries of Zamboanga Peninsula—Ecosystem model that may be applied to other fishing grounds in the country  | University of the Philippines Visayas (UPV)   | Local commercial and municipal fisheries sector, fisheries stakeholder and consumers, regional BFAR and NSAP, and academe   | 01-Apr-22 | 31-Mar-25 | ONGOING                          | 11,474,842         | 3,624,018.83     |
| Attaining sustainability in the fisheries for sardines and other small pelagic fish off the Zamboanga Peninsula (v. 2021) | Proj. 2 Trophic Role of Sardinelemuru off the Zamboanga Peninsula  | Rapid, inclusive and sustained economic growth                            | The program builds on the results of the first phase of investigations of the Zamboanga Upwelling System and the fisheries it supports, and seeks to provide answers to the major questions arising from these results, particularly those concerning maturity, spawning, early stage growth and recruitment, the fry fisheries, and the role of sardines as a key species in the trophic structure of the ecosystem and how its fisheries affects associated small pelagic stocks. In addition, the new studies cover the entire Zamboanga Peninsula (East Sulu Sea) to examine more closely the coupling of North and South Zamboanga, as suggested by the results of previous studies.  | Science based information as input to policy on: 1. Food web of sardine and other components small and large pelagic species. 2. The protection of feeding or nursery grounds of sardines in Northern Zamboanga Peninsula 3. MS Marine Biology graduate specializing on the role of sardines in food webs off Northern Zamboanga Peninsula 4. Research staff with expertise on trophic analysis in Philippine pelagic ecosystem using C, N and O stable isotope and stomach content analysis, and predator-prey and pelagic ecosystem Ecosim with Ecosim (free software) simulation modeling 5. Enhanced understanding of sardine feeding interactions (predator-prey and competitive relationships) 6. Management scenario options for the small pelagic fisheries off Northern Zamboanga Peninsula   | Mindanao State University - Iligan Institute of Technology (MSU-IIT)  | Regional and National BFAR, NSAP, NFRD/Local commercial and municipal fisheries sector/Fisheries stakeholder/Sardine run tourism industry/Academic institutions offering marine sciences/Sardine and mackerel canning and bottling industries/Sardine and small pelagic fisher folks/MSU/PhD (BS/MS/So/PhD) | 01-Apr-22 | 31-Mar-25 | ONGOING                          | 9,923,747          | 2,472,576.18     |
| Biodiversity and Resilience of Coral Reef and Other Ecosystems in Submarine Groundwater Discharge Areas                   | Proj. 3. Response of Coral Communities in Various Submarine Groundwater Discharge (SGD) sites  | Rapid, inclusive and sustained economic growth                            | SGD is now slowly recognized as an important factor that determines the chemistry of ocean waters. Compared to rivers which has a defined entry to the sea, SGD can potentially discharge into the sea along the coastal area and into the shelf highlighting the wider influence that SGD may contribute. SGD is also in contact with rocks, soils and sediments which are main sources of dissolved metals, nutrients, and potential urban contaminants can impact the coastal environment as much as or maybe even more than rivers. SGD and its influence on the coral reef ecosystem in Mabini is an area where we might find ways of preserving our reefs given the threats of warming, ocean acidification, and eutrophication. If SGD indeed factors in, then there are more reasons to include this factor in marine surveys, setting-up of marine protected areas, and in environmental protection guidelines for sustainable tourism, which are not included in any of the guidelines worldwide.  | 1. Spatio-temporal characterization of coral communities (benthos, fish and macroinvertebrates) and coral recruitment in SGD and non-SGD sites 2. Physiological characterization (growth rate, chlorophyll a content, zooxanthellae density, and diversity + Symbiondium clade identification) of common species in SGD and non-SGD sites  | University of the Philippines Diliman (UPD)   | Fisheries managers, Resource planners, local and global scientists  | 01-Aug-21 | 31-Jul-24 | COMPLETED                        | 13,511,330         | 1,777,306.80     |
| Biodiversity and Resilience of Coral Reef and Other Ecosystems in Submarine Groundwater Discharge Areas                   | Proj. 4. Probing Microbial Diversity in Submarine Groundwater Discharge (SGD) Areas  | Rapid, inclusive and sustained economic growth                            | SGD is now slowly recognized as an important factor that determines the chemistry of ocean waters. Compared to rivers which has a defined entry to the sea, SGD can potentially discharge into the sea along the coastal area and into the shelf highlighting the wider influence that SGD may contribute. SGD is also in contact with rocks, soils and sediments which are main sources of dissolved metals, nutrients, and potential urban contaminants can impact the coastal environment as much as or maybe even more than rivers. SGD and its influence on the coral reef ecosystem in Mabini is an area where we might find ways of preserving our reefs given the threats of warming, ocean acidification, and eutrophication. If SGD indeed factors in, then there are more reasons to include this factor in marine surveys, setting-up of marine protected areas, and in environmental protection guidelines for sustainable tourism, which are not included in any of the guidelines worldwide.  | Database on the diversity of microbial communities in selected SGD affected sites Database on microbial community structures in selected SGD affected sites Protocols for culture-independent methods for microbial diversity studies, such as sample preparation, DNA extraction, PCR amplification and DNA fingerprinting  | University of the Philippines Diliman (UPD)   | Academe, Biotechnologists Microbiologists, microbial ecologists and systematists Natural products chemists and researchers Researchers and scientists involved in microbial diversity conservation  | 01-Aug-21 | 31-Dec-24 | ONGOING                          | 14,884,593         | 2,306,900.40     |
| Biodiversity and Resilience of Coral Reef and Other Ecosystems in Submarine Groundwater Discharge Areas                   | Proj. 1. Distribution, Type and Fluxes of Submarine Groundwater Discharge (SGD) in Mabini, Batangas  | Rapid, inclusive and sustained economic growth                            | SGD is now slowly recognized as an important factor that determines the chemistry of ocean waters. Compared to rivers which has a defined entry to the sea, SGD can potentially discharge into the sea along the coastal area and into the shelf highlighting the wider influence that SGD may contribute. SGD is also in contact with rocks, soils and sediments which are main sources of dissolved metals, nutrients, and potential urban contaminants can impact the coastal environment as much as or maybe even more than rivers. SGD and its influence on the coral reef ecosystem in Mabini is an area where we might find ways of preserving our reefs given the threats of warming, ocean acidification, and eutrophication. If SGD indeed factors in, then there are more reasons to include this factor in marine surveys, setting-up of marine protected areas, and in environmental protection guidelines for sustainable tourism, which are not included in any of the guidelines worldwide.  | 1. Map of SGD occurrences from the coast to a depth of 30 m in Mabini, Batangas 2. Characterization of acoustic signal of different SGD types 3. Estimates of spatio-temporal variation in fluxes over 3. Protocols for the use of satellite images and acoustics for rapid assessment of SGD occurrences.   | University of the Philippines Diliman (UPD)   | Fisheries managers, resource planners, local and global scientists  | 01-Aug-21 | 31-Jul-24 | COMPLETED                        | 7,562,840          | 913,225.86       |
| Biodiversity and Resilience of Coral Reef and Other Ecosystems in Submarine Groundwater Discharge Areas                   | Proj. 2 Marine Benthic Geochemistry and Ecosystems Associated with Submarine Groundwater Discharge (SGD)   | Rapid, inclusive and sustained economic growth                            | SGD is now slowly recognized as an important factor that determines the chemistry of ocean waters. Compared to rivers which has a defined entry to the sea, SGD can potentially discharge into the sea along the coastal area and into the shelf highlighting the wider influence that SGD may contribute. SGD is also in contact with rocks, soils and sediments which are main sources of dissolved metals, nutrients, and potential urban contaminants can impact the coastal environment as much as or maybe even more than rivers. SGD and its influence on the coral reef ecosystem in Mabini is an area where we might find ways of preserving our reefs given the threats of warming, ocean acidification, and eutrophication. If SGD indeed factors in, then there are more reasons to include this factor in marine surveys, setting-up of marine protected areas, and in environmental protection guidelines for sustainable tourism, which are not included in any of the guidelines worldwide.  | 1. Protocols for successful water, sediment, biomass sample collection from various environmental conditions of SGD Areas 2. Isotopic characterization of water from SGD and non-SGD sites 3. Ionic composition of the waters (SGD, ambient seawater) 4. Trace metal composition of the waters (SGD, ambient seawater) 5. Map of seagrass occurrence and type 6. Summary of lipids of dominant seagrasses across physico-chemical conditions 7. Synthesis of molecular markers in the sediments that will provide information on the biosynthetic pathways and diagenetic degradation. 8. Compound-specific C and H of select lipids   | University of the Philippines Diliman (UPD)   | Local communities in Mabini (resort owners), teachers, students, LGUs, tourists) and nearby HEIs (i.e. Batangas State University)   | 01-Aug-21 | 31-Dec-24 | ONGOING                          | 20,395,005         | 2,030,466.20     |
| Ecological factors affecting mesophotic coral reef ecosystems: potential refuge from disturbances                         | Proj. 1 Biodiversity in Mesophotic Coral Reef Ecosystems   | Rapid, inclusive and sustained economic growth                            | Coral reefs today are threatened by multiple stresses at varying spatio-temporal scales. Mesophotic coral reef ecosystems, which are coral reefs that occur at depths of 30 m and deeper, have been to provide a refuge against such large-scale stressors, considering their ability to buffer against disturbances such as increased temperatures and storms (Lesser et al. 2009), and their often close proximity to euphotic (i.e., shallow-water; 0 to 30 m deep) reefs (Bridge et al. 2013). Recent work has suggested that the potential of mesophotic reefs to function as a refuge for euphotic reefs is not universal and depends on various biological and physical factors that are taxa- and site-specific (Bongaerts et al. 2010, 2017). Refuge potential is partly determined by the connectivity of reef sites (i.e., are adjacent reefs biologically and physically connected), which is determined by species-specific dispersal potential and post-settlement survival of reef organisms, and site-specific oceanographic patterns (Cowen & Sprounle 2009), as well as the adaptive capacity of mesophotic organisms. Thus, there is a need to improve understanding of these various factors in order to better assess the refuge potential of mesophotic reef ecosystems. | Biodiversity of coral, including precious corals, and reef fish communities in selected mesophotic sites in the Philippines Differential susceptibility of the shallow and mesophotic reefs to thermal stress-induced coral bleaching, based on the presence of coral taxa that are susceptible to thermal stress. Trained at least five staff in technical diving (mesophotic diving)/Training workshops (at least one at each of the five sites) on biodiversity survey and thermal stress impact assessment/Engage MS and/or PhD DOST/PCARRD scholars who intend to do their research on mesophotic coral reef ecosystem (Education, Education, and Communication (EC) materials distributed and biodiversity and role of mesophotic coral ecosystems as refuge from disturbances at least two (2) manuscripts prepared for publication on mesophotic coral ecosystems Handbook on mesophotic coral ecosystems in the Philippines/Video production summarizing findings from the Program/Science-based inputs to policy recommendations on biodiversity conservation and climate change adaptation  | University of the Philippines Diliman (UPD), Mariano Marcos State University (MMSU), Holy Name University (HNU) | Local communities, local government units (LGUs), fishers, research/scientific community and students   | 01-Nov-22 | 31-Oct-25 | ONGOING                          | 40,847,667         | 11,696,529.47    |
| Ecological factors affecting mesophotic coral reef ecosystems: potential refuge from disturbances                         | Proj. 2 Investigating the Genetic Basis of Adaptive Capacity in Mesophotic Organisms   | Rapid, inclusive and sustained economic growth                            | Coral reefs today are threatened by multiple stresses at varying spatio-temporal scales. Mesophotic coral reef ecosystems, which are coral reefs that occur at depths of 30 m and deeper, have been to provide a refuge against such large-scale stressors, considering their ability to buffer against disturbances such as increased temperatures and storms (Lesser et al. 2009), and their often close proximity to euphotic (i.e., shallow-water; 0 to 30 m deep) reefs (Bridge et al. 2013). Recent work has suggested that the potential of mesophotic reefs to function as a refuge for euphotic reefs is not universal and depends on various biological and physical factors that are taxa- and site-specific (Bongaerts et al. 2010, 2017). Refuge potential is partly determined by the connectivity of reef sites (i.e., are adjacent reefs biologically and physically connected), which is determined by species-specific dispersal potential and post-settlement survival of reef organisms, and site-specific oceanographic patterns (Cowen & Sprounle 2009), as well as the adaptive capacity of mesophotic organisms. Thus, there is a need to improve understanding of these various factors in order to better assess the refuge potential of mesophotic reef ecosystems. | Characterized microbial symbiont diversity in at least two species of mesophotic corals and sponges/Generated reference transcriptome sequences for at least one species of coral and sponge from selected mesophotic reefs/Validated gene expression responses of at least one species of coral and sponge transplanted at different depths/At least two (2) manuscripts prepared for publication on mesophotic coral ecosystemat/formation, Education, and Communication (EC) materials distributed and biodiversity and role of mesophotic coral ecosystems as refuge from disturbances Trained at least 2 staff in microbiome and transcriptome analysis/Training workshops (at least one at each of the three sites) on adaptive capacity of organisms in mesophotic coral ecosystems/Engage MS and/or PhD DOST/PCARRD scholars who intend to do their research on mesophotic coral ecosystems/Science-based inputs to policy recommendations on biodiversity conservation and climate change adaptation  | University of the Philippines Diliman (UPD)   | Local communities, local government units (LGUs), fishers, research/scientific community and students   | 01-Nov-22 | 31-Oct-25 | ONGOING                          | 26,163,174         | 6,955,444.00     |
| Ecological factors affecting mesophotic coral reef ecosystems: potential refuge from disturbances                         | Proj. 3 Examining Population Connectivity between Euphotic and Mesophotic Coral Reef Ecosystems  | Rapid, inclusive and sustained economic growth                            | Coral reefs today are threatened by multiple stresses at varying spatio-temporal scales. Mesophotic coral reef ecosystems, which are coral reefs that occur at depths of 30 m and deeper, have been to provide a refuge against such large-scale stressors, considering their ability to buffer against disturbances such as increased temperatures and storms (Lesser et al. 2009), and their often close proximity to euphotic (i.e., shallow-water; 0 to 30 m deep) reefs (Bridge et al. 2013). Recent work has suggested that the potential of mesophotic reefs to function as a refuge for euphotic reefs is not universal and depends on various biological and physical factors that are taxa- and site-specific (Bongaerts et al. 2010, 2017). Refuge potential is partly determined by the connectivity of reef sites (i.e., are adjacent reefs biologically and physically connected), which is determined by species-specific dispersal potential and post-settlement survival of reef organisms, and site-specific oceanographic patterns (Cowen & Sprounle 2009), as well as the adaptive capacity of mesophotic organisms. Thus, there is a need to improve understanding of these various factors in order to better assess the refuge potential of mesophotic reef ecosystems. | Short reef sequences and single nucleotide polymorphism markers generated for two coral reef ecosystems, which are coral reefs that occur at depths of 30 m and deeper, have been to provide a refuge against such large-scale stressors, considering their ability to buffer against disturbances such as increased temperatures and storms (Lesser et al. 2009), and their often close proximity to euphotic (i.e., shallow-water; 0 to 30 m deep) reefs (Bridge et al. 2013). Recent work has suggested that the potential of mesophotic reefs to function as a refuge for euphotic reefs is not universal and depends on various biological and physical factors that are taxa- and site-specific (Bongaerts et al. 2010, 2017). Refuge potential is partly determined by the connectivity of reef sites (i.e., are adjacent reefs biologically and physically connected), which is determined by species-specific dispersal potential and post-settlement survival of reef organisms, and site-specific oceanographic patterns (Cowen & Sprounle 2009), as well as the adaptive capacity of mesophotic organisms. Thus, there is a need to improve understanding of these various factors in order to better assess the refuge potential of mesophotic reef ecosystems. | University of the Philippines Diliman (UPD)   | Local communities, local government units (LGUs), fishers, research/scientific community and students   | 01-Nov-22 | 31-Oct-25 | ONGOING                          | 17,570,847         | 6,032,115.00     |

| 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, 2024 | Total Project Cost | 2024 PCAARRD GIA |
|--|---|---|---|--|---|---|-----------|-----------|---------------------------------|--------------------|------------------|
| Establishment of the Center for Mollusc Research and Development   | Development of Spawning and Hatchery Techniques for the Blood Cockle ( <i>Anadara granosa</i> ) for sustainable aquaculture   | Rapid, inclusive and sustained economic growth                            | In the Philippines, bivalve production is mostly focused on oyster and mussel farming while little has been achieved with regards to breeding and production of blood cockles, <i>Anadara granosa</i> . The proposal will develop a spawning and hatchery techniques for the species to ensure sustainable aquaculture production of this commodity that will benefit local fisherfolk in the Philippines as well as realize the full potential of the resource as a high-value export commodity.   | <p>Products</p> <ul style="list-style-type: none"> <li>€Hatchery protocols and design with potential for pilot testing to target Fisherfolk association (KASAMA Inc.)</li> <li>Publication <ul style="list-style-type: none"> <li>€At least 2 papers on hatchery techniques and grow-out (ranching type) potential of blood cockles</li> </ul> </li> <li>People and Services <ul style="list-style-type: none"> <li>€Improve and disseminate the need for hatchery interventions in maintaining wild stocks of mollusks</li> <li>€At least 1 Training-Workshop on hatchery supported restocking techniques among stakeholders (LGU, Aklan, LGU Cebu, Fisherfolk associations)</li> <li>€Trained personnel (At least 10)</li> <li>€Graduate students (At least 3 supported)</li> </ul> </li> <li>Places and Partnerships <ul style="list-style-type: none"> <li>€Partnership with Kalibo Save the Mangroves Inc. (NGO) and Aklan State University on the potential of setting up a cockle hatchery in Aklan</li> <li>€MOA/MOU with KASAMA and NFMIC</li> </ul> </li> <li>Patent <ul style="list-style-type: none"> <li>€Potential utility model for hatchery protocols of rearing blood cockles (pending results of prior art search)</li> </ul> </li> <li>Policy <ul style="list-style-type: none"> <li>€SAT based information that will input into policies or guidelines on the implementation of ranching techniques for the blood cockle fishery in selected sites (i.e. use of hatchery reared blood cockle spats to replenish wild stock)</li> </ul> </li> <li>Social Impact <ul style="list-style-type: none"> <li>€Improved appreciation among stakeholders for the use of aquaculture technologies in ensuring sustainable harvests of bivalve commodities.</li> <li>€Enhanced cooperation between stakeholders and research institutions to provide more grounded research initiatives.</li> </ul> </li> </ul> | University of the Philippines Visayas (UPV) | <p>1. Cockle harvesters - Improved income due to increased production</p> <p>2. LGU - Improved livelihood for fisherfolk through sustainable strategies</p> <p>3. Export partners - Improved and constant supply of cockles for export</p>  | 01-Dec-21 | 30-Nov-24 | COMPLETED                       | 9,497,344          | 2,143,696.80     |
| Ploidy-dependent physiological and chemical traits of <i>Kappaphycus</i> cultivars   | Project 1. Prevalence and ploidy-dependent physiological responses in farmed cultivars and novel strains of <i>Kappaphycus</i>  | Integrity of the environment and climate change adaptation and mitigation | Ploidy is the number of complete sets of chromosomes in a cell or an organism, which can either be monoploid (haploid; 1 set), diploid (2 sets), or polyploid (3 or more chromosome sets). Variation in ploidy confers adaptive and ecological significance. For example, among unicellular organisms, haploids are less fit than diploids following exposure to mutagens but are more fit than diploids under certain nutrient limited conditions, but not under others. Polyploids are common among plants and green algae but are less adequately documented in red and brown algae. Increasing ploidy level is suggested to improve plant traits such as size, quality, yield, enhanced vigor, and improved tolerances to environmental stresses, pests, and pathogens. Whether this is true among our farmed eukaryotoids remained to be investigated. This study will determine the prevalence of ploidy corresponding to specific life history phase among commercial and novel <i>Kappaphycus</i> strains, and their corresponding physiological and biochemical characteristics. Unravelling the occurrence and prevalence of specific ploidy in <i>Kappaphycus</i> is important in: (1) understanding corresponding agrar and productivity among different cultivars; (2) selecting novel strains from the wild for future domestication replacing old and fatigued cultivars; and (3) developing tools for breeding and crop improvement programs. | <p>Publication: At least 2 published papers in ISI journal Patent: None for the phase Product: Well-characterized robust cultivar(s) for distribution and cultivation by seaweed farmers/associations. The project will support at least two graduate students' theses/Place: Establish collaboration with seaweed farmers/cooperatives/associations in Palawan, Samar, and Sorsogon/Policy: Contribute to national seaweed research and utilization agenda.</p>   | University of the Philippines Diliman (UPD) | Seaweed farmers, policy makers, national and global scientists.   | 01-Jun-23 | 31-May-26 | ONGOING                         | 11,374,188         | 3,192,745.15     |
| Ploidy-dependent physiological and chemical traits of <i>Kappaphycus</i> cultivars   | Project 2. Development of Genetic and Chemical Markers for Identifying Tetrasporophytes, Male Gametophytes and Female Gametophytes of <i>Kappaphycus alvarezii</i> and <i>K. striatus</i> | Integrity of the environment and climate change adaptation and mitigation | This study will address this major gap in the biology and ecology of representative species of carrageenophytes (species of <i>Kappaphycus</i> ) in the country by developing genetic markers useful for distinguishing their ploidy and sex states. These markers will be useful in semi-population surveys and seedstock selection programs. The metabolomes of the genotyped seaweeds will also be investigated to discover potential chemical markers for ploidy/sex of these seaweeds (and possibly potentially valuable natural products that can be derived from these seaweeds).  | <p>Publication: 5 scientific papers published in international refereed journal Patent: None for this phase Product: genetic markers for phase (ploidy) and sex for <i>Kappaphycus</i> species/biochemical markers for phase (ploidy) and sex for <i>Gaillardia</i> species/genetic markers for phase (ploidy) and sex for <i>Gaillardia</i> species/biochemical markers for phase (ploidy) and sex for a given specimen of <i>Kappaphycus</i>/Genetic/People: potential training of seaweed researchers in government or academe interested in a training on the application of the diagnostic techniques developed by this study/Places and Partnership: potential linkage with BFAR or NFRDI or academic institutions for the sharing/transfer of the techniques</p>  | University of the Philippines Diliman (UPD) | The eventual target beneficiaries of the project are those involved in the seaweed industry (seaweed farmers and traders, carrageenan/agar manufacturers).  | 01-Jun-23 | 31-May-26 | ONGOING                         | 12,287,333         | 3,813,146.15     |
| Supporting Our Seas Through Automated and Integrated Networks (SUSTAIN): Strengthening Ocean Observation and Management of Risks to Coastal Ecosystems | Project 1. Applying coastal observation and modeling systems to address different use cases in Philippine coastal waters  | Rapid, inclusive and sustained economic growth                            | The marine and coastal waters of the Philippines are experiencing multiple threats as coastal development, pollution, harmful algal blooms and climate change impact them. These lead to compromised conditions of these waters and the ecosystems situated within, which redound to the difficulty of sustaining the resources Filipinos rely on. Despite these risks to ocean resources, key properties of coastal waters are not consistently and transparently tracked, changes are not well-understood and attributed, and there is no capacity to evaluate different scenarios and plan for the long-term based on projected changes. This project aims to fill in an important gap and develop the capacity for consistent, rapid and high frequency ocean observation, and for ocean physical and biogeochemical/ecological modeling. Data and information from these observation and modeling systems will then be applied to a variety of use cases in the target sites. Inherent in this process is the engagement with stakeholders to come up with a co-designed fit-for-purpose ocean observation and modeling system. This   | <p>Publication</p> <ul style="list-style-type: none"> <li>1 manuscript for publication in an ISI journal</li> </ul> <p>Products</p> <ul style="list-style-type: none"> <li>New PNMOMS version and units produced</li> </ul> <p>Hydrodynamic models for target sites</p> <p>Biogeochemical models for target sites</p> <p>Oceanographic information infrastructure system</p> <p>Use cases where ocean models are applied to local concerns</p> <p>People Services</p> <ul style="list-style-type: none"> <li>At least 10 researchers and practitioners trained in ocean observation systems;</li> </ul>  | University of the Philippines Diliman (UPD) | <p>LGUs and local communities at the target sites</p> <p>Relevant government agencies € LGU, BFAR, DENR</p> <p>Private industry stakeholders such as ASIN and tourism industry</p> <p>SUICs/researchers and practitioners for capacity-building</p> <p>Other countries/stakeholders with similar contexts that can learn through the link with CoastPredict</p> | 01-Sep-24 | 31-Aug-27 | ONGOING                         | 23,521,240         | 9,105,205.00     |
| Supporting Our Seas Through Automated and Integrated Networks (SUSTAIN): Strengthening Ocean Observation and Management of Risks to Coastal Ecosystems | Project 2. Current and Emerging Chemical Threats to Coastal Ecosystems Health in the Philippines  | Rapid, inclusive and sustained economic growth                            | Marine toxins threaten the health of the oceans and pose threats to the marine biota and humans. The increasing incidence of harmful algal blooms (HABs) in marine and coastal ecosystems warrants the establishment of technical capabilities in the Philippines for enhanced monitoring and conducting assessment of emerging toxins. In this project, we aim to survey two sites used for tourism and mariculture activities. We aim to determine the prevalence of paralytic shellfish toxins (PSTs) and other classes of toxins. This will aid in establishing cost-effective methods for toxin monitoring, enhance technical capacity for toxin monitoring, and establish the prevalence of emerging toxins in different areas in the Philippines.  | <p>Products</p> <ul style="list-style-type: none"> <li>1-2 Guidebook/Manual on HAB-causing organisms, BATT deployment &amp; retrieval</li> </ul> <p>€nbsp;</p> <p>€nbsp;</p> <p>Publication</p> <ul style="list-style-type: none"> <li>3-6 publications</li> </ul> <p>€nbsp;</p> <p>€nbsp;</p> <p>People and Services</p> <ul style="list-style-type: none"> <li>€nbsp;</li> </ul> <p>€nbsp;</p> <ul style="list-style-type: none"> <li>4-6 MS/PhD students</li> <li>10-15 trainees/students</li> </ul> <p>Trainings on HABs ID using new and merging methods (molecular and CLSM)</p> <p>Training for field sampling of pollutants and laboratory analyses</p> <p>Training on BATT deployment and use</p> <p>€nbsp;</p> <p>€nbsp;</p> <p>Partnerships</p>   | University of the Philippines Diliman (UPD) | <p>LGUs and local communities at the target sites</p> <p>Relevant government agencies € LGU, BFAR, DENR</p> <p>Private industry stakeholders such as ASIN and tourism industry</p> <p>SUICs/researchers and practitioners for capacity-building</p> <p>Other countries/stakeholders with similar contexts that can learn through the link with CoastPredict</p> | 01-Sep-24 | 31-Aug-27 | ONGOING                         | 5,446,328          | 1,779,676.00     |

| 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, 2024 | Total Project Cost | 2024 PCAARRD GIA |
|--|--|---|---|--|--|--|-----------|-----------|---------------------------------|--------------------|------------------|
| Supporting Our Seas Through Automated and Integrated Networks (SUSTAIN): Strengthening Ocean Observation and Management of Risks to Coastal Ecosystems | Project 3. Cultivating people-centered risk knowledge building with coastal communities through citizen science  | Rapid, inclusive and sustained economic growth                            | Coastal communities and small-scale fishers in the Philippines continually face worsening coastal challenges such as dwindling fish catch, habitat destruction and loss of income that severely threaten food production, livelihoods, and income. These are affected by multiple hazards and drivers such as loss of biodiversity, environmental degradation and pollution, and climate-change-related phenomena such as sea level rise. Despite these occurrences, there are pronounced gaps in systematizing the risk knowledge of these coastal threats. At the same time, community-based risk management approaches disregard community capacities and responses with top-down strategies. While the trend for citizen science practice worldwide grows, there is still a need to reinforce citizen science models that give more access to local people in defining problems, designing research, as well as analyzing and utilizing information for appropriate actions.<br><br>This proposed project aims to initiate community-based risk knowledge-building to contribute to effective risk management of coastal threats, through the process of community-scientists co-creation. This can be achieved by increasing the community's self-assessment capacities, initiating a community-based monitoring mechanism for coastal ecosystem parameters, and developing response plans for coastal ecosystem risks.  | Publication<br>1 manuscript for publication in a peer-reviewed journal<br><br>Products<br>One (1) Toolkit for Enhancing Community-based Citizen Science framework in coastal ecosystem risk management<br>Hydrodynamic models for target sites<br><br>Profile<br>of at-risk populations in the partner communities<br><br>Community-based monitoring frameworks and plans<br><br>Livelihoods<br>impact mitigation plans and advocacy plans<br><br>People Services<br>Three Trainings on coastal ecosystem threats for 80 participants  | University of the Philippines Diliman (UPD)    | LGUs and local communities at the target sites<br>Relevant government agencies @ LGU, BFAR, DENR<br>Private industry stakeholders such as ASIN and tourism industry<br>SUCs/researchers and practitioners for capacity-building<br>Other countries/stakeholders with similar contexts that can learn through the link with CoastProduct  | 01-Sep-24 | 31-Aug-27 | ONGOING                         | 13,545,538         | 4,642,396.00     |
|  | Innovation Willingness and Readiness of Fish and Seafood Processing Micro, Small and Medium Enterprises (MSMEs) in Luzon for Food Safety Standards<br><br>(Old title: Innovation Willingness and Readiness of Fish and Seafood Processing Micro, Small and Medium Enterprises (MSMEs) for Food Safety Standards) | Integrity of the environment and climate change adaptation and mitigation | This study aims to assess willingness, capability, and readiness of fish and seafood processing MSMEs to innovate for food safety. Understanding these characteristics precedes that of promoting innovation adoption. This study further aims to contribute to the current limited scholarly work on innovation capability in the Philippines and provide policy support to existing laws promoting innovation among MSMEs with particular focus on food safety.   | Publication: At least one (1) article in a refereed journal on innovation capability of processing MSMEs in fish and seafood sector<br>At least four (4) technical reports (i.e. 3 progress, 1 terminal)<br><br>At least one (1) policy brief relating to food safety and innovation of processing MSME in fish and seafood sector/Product: At least five (5) innovation capability intervention models for the processing MSMEs in the fish and seafood sector/People and Services: At least 20 men and women staff of processing MSMEs in the fish and seafood sector provided with specific aspects of their operation that need to be improved for chances of successful innovation activities/Partnership: At least 10 partnerships established comprising of regional Bureau of Fisheries and Aquatic Resources (BFAR), Department of Trade and Industry (DTI), and local government unit/Policy: Policy recommendations useful to government agencies' more focused effort on promoting innovation adoption among MSMEs   | University of the Philippines Los Baños (UPLB) | Small and micro-enterprises (coastal and marine processing)<br>Local government units governing coastal communities<br>National Government. Agencies involved in promoting innovation  | 01-Jul-22 | 30-Jun-24 | COMPLETED                       | 5,000,000          | 800,400.53       |
|  | Access and Benefit Sharing Policy Options for the Sustainable Management of Batanes Protected Landscapes and Seascapes (ABS Batanes)   | Rapid, inclusive and sustained economic growth                            | The declaration of Batanes as a protected area brought about many benefits that contributed to the conservation of the protected area's unique biodiversity and rich cultural heritage. However, the declaration has also impacted the lives of the people in terms of what they can and cannot do, particularly to their livelihoods. The project aims to explore policies that will enhance the welfare of major stakeholders most affected by the effects of the Batanes Protected Landscapes and Seascapes and ensure its sustainability. Specifically, it aims to examine the BPLS declaration and other related policies, and their implementation, profile the distributional effects of the Batanes protected area declaration among key stakeholders through access benefit sharing analysis, assess the policy options based on social safeguards, access and benefit sharing, and recommend policy options that will ensure the sustainable management of BPLS and other protected areas in the Philippines. These objectives will be accomplished through the analysis of the effects of BPLS declaration and other related policies, stakeholder mapping and profiling of distributional effects, access benefit sharing analysis, multicriteria analysis, and policy analysis. The project's outputs will include publications in refereed journal, policy brief, audio-visual presentation, partnerships, capacity of POs and partners, and policy options for the sustainable management of BPLS. The project's potential social impacts include increased awareness of rights on the sustainable use and conservation of natural and cultural resources, promotion of social inclusion particularly access to benefits derived from PA declaration, and preservation of cultural practices of the batans. On the other hand, the project's potential economic impacts include improved welfare of men and women through sustainable livelihood in BPLS, inclusive growth among batan communities, conservation of resources of the BPLS and equitable sharing of benefits from the BPLS.   | Publication: At least two (2) articles ready for publication in refereed journals/At least one (1) Policy Brief/One (1) video explainer of policy brief/Product: 6 Science-based policy interventions, access and benefit sharing framework for protected areas/Places and Partnerships: Partnership with SSC in project implementation (Collaborative Research Agreement)/Partnership through MOU with PAMB, DENR, LGU and other agencies within the protected area/People Services: Roundtable discussions or stakeholder consultation workshop/Partnership: At least ten (10) staff of LGU, DENR/PAMB, NGO, POs and academe on the use of valuation tools in collaboration with VALUES Lab/At least two (2) trained undergraduate (BS) and two (2) graduate (MSP/PhD) students/Involvement and team management/Social Impact: Awareness of rights on the sustainable use and conservation of natural and cultural resources; Promote social inclusion particularly access to benefits derived from PA declaration; Preservation of cultural practices of the batans/Economic Impact: Improved welfare of men and women through sustainable livelihood in BPLS—Inclusive growth among batan communities—Conservation of resources of the BPLS—Equitable sharing of benefits from the BPLS  | University of the Philippines Los Baños (UPLB) | Policy and decision makers, academe (students, faculty members, researchers), local government units, government agencies (DENR, POs, island communities (men and women).  | 01-Jun-24 | 31-May-26 | ONGOING                         | 5,000,000          | 2,925,043.00     |
|  | Advocating for the Institutionalization of Payment for Water Ecosystem Service (P-WES) in the Philippines  | Rapid, inclusive and sustained economic growth                            | The Payment for Water Ecosystem Services (P-WES) has been recognized in the Philippines as one of the solutions to water-related crises. However, P-WES has not been institutionalized in the country. Continuing and building on the efforts of UPLB-INREME's P-WES and PESO-SWAP's projects, the proposed project aims to mobilize and collaborate with key national and sub-regional stakeholders for the institutionalization of P-WES. A series of policy dialogues at the local and national level with different institutions, e.g., Nueva Vizcaya Provincial board in parallel to the lower and upper house, DENR-IBCO, and DENR-FMB, will be conducted. These dialogues will culminate into a one-day Science Policy Dialogue, where all of the relevant institutions and concerned stakeholders will be invited. The proposed National P-WES Policy will be presented at this event. The participants will be able to raise concerns, and suggestions for the proposed National P-WES Policy. Concurrently, dialogues will also be conducted with the Provincial Local Government of Nueva Vizcaya for the local P-WES ordinance. These policy dialogues will address the key developments to be timely relevant, inclusive of the ideas and sentiments of all stakeholders. The results of this project include a national and local policy on P-WES, stimulating the establishment of P-WES mechanism in the country, boosting efforts for sustainability.  | Publication: One (1) advocacy kit which contains the following: a) One (1) Brochure on the National P-WES Policy; b) One (1) Policy Brief; c) One (1) Video explainer regarding P-WES in the Philippines and its role in addressing water related issues in the country; d) Science Policy Dialogue Proceedings/People Services: 100 participants learning about the status and significance of P-WES mechanisms in the Philippines/Partnerships: 100 participants with improved knowledge, understanding, and appreciation of P-WES as an environmental management approach in the Philippines/Partnership: Memorandum of Agreement with DENR-IBCO and DENR-FMB/Partnership: Memorandum of Agreement with future partner institutions in Nueva Vizcaya/Partnership: Community of practice to advance and ensure continuity of efforts for P-WES institutionalization in the country/Partnership: One (1) P-WES Policy Brief/Partnership: One (1) Draft National P-WES Policy/Partnership: One (1) Provincial Ordinance in Nueva Vizcaya/Partnership: One (1) Economic Impacts a. Poverty alleviation in communities who manage water sources b. Better provision of water ecosystem services, which bring about improvements to other ecosystem services and institutions that are connected with it. For example, higher quality and quantity of water can lead to more business in ecotourism areas and farmlands. 2. Social Impacts/Partnership: a. Improved water quality and quantity in different areas of the country b. Sustainable development of different communities in water source areas c. Empowerment of communities who manage water sources d. Enhancement of water services can tackle other issues such as food insecurity/Partnership: Partnerships        | University of the Philippines Los Baños (UPLB) | The target participants of the Science Policy Dialogue are the different stakeholders of the P-WES and PESO SWAP projects. These stakeholders come from various agencies, institutions, and organizations. The heads or representatives of different government agencies, provincial and local government units, CSO/NGOs, and academe will be invited. A minimum of 100 participants from the following agencies/institutions/organizations are expected to attend: Senate House of Representatives—Local Government Units—Water Districts—Protected Area Management Boards—Private Sector—Civil Society Organizations—Academe—National Government Agencies | 01-Jun-24 | 30-Nov-25 | ONGOING                         | 5,000,000          | 3,674,110.00     |
|  | Advocating Policy Reforms Towards Effective and Efficient Conduct of Public R & D in the Philippines   | Integrity of the environment and climate change adaptation and mitigation | In keeping with PCAARRD's Policy Analysis and Advocacy framework, this study will use Kingdon's multiple stream framework to understand the challenges and interests involved with advancing the utilization of Sec 51.8 of RA 9184 and in promoting the granting of honoraria to researchers. The use of policy scanning and stakeholder mapping will allow for a deeper understanding of the problem. The policy streams which intend to provide policy solutions will be addressed through the conduct of policy dialogues, round-table discussions among others. The policy stream will involve identification of cooperating policy champions to engage in the reproduction of policy instruments and serve as primary actors in the targeted advocacy campaign aimed at the particular government agencies. At the end of the project, a policy instrument that provides guidance to the research community is envisioned.  | Publication:<br>1. Journal Article<br>2. Policy briefs<br>Advocacy materials tailored for specific audiences<br>3-5 minute video explainer<br>Process documentation of the advocacy<br>People and Services:<br>Round Table Discussions<br>Regional and National Policy Dialogues<br>Information Dissemination Seminars/Workshops<br>Places and Partnerships:<br>With NGA involved in the procurement and granting of honoraria<br>Agreements or partnerships on advocacy and campaign formed through technical working groups or interagency groups<br>Policy:<br>Policy recommendations drafted and formally endorsed<br>2. Policy instruments advocated and endorsed   | University of the Philippines Los Baños (UPLB) | Cooperating policy entrepreneurs of DBM, COA, GPPB, DOST, DENR, DA, CHED, CPBRD, RDS   | 01-Dec-22 | 30-Nov-24 | COMPLETED                       | 5,000,000          | 521,178.00       |
|  | Agriculture's Footprints, Gaps and Potentials Towards a Circular Bioeconomy: The Case of the Smallholder Farms in Caraga Region  | Rapid, inclusive and sustained economic growth                            | Agriculture serves an important source of livelihood and resources to Filipinos. Yet, it is not always a boon due to its environmental footprints, particularly in the Philippines as it is highly susceptible to natural disasters and climate change. It is imperative to take proactive measures to establish policies that strike a balance between economic growth and environmental sustainability, ensuring a more sustainable and resilient future for Filipinos. One promising approach to this is through the adoption of circular bioeconomy principles, which leverages biological resources to generate value while minimizing waste and reducing negative environmental impacts. The Caraga Region, part of the fragile areas in the Philippines, faces significant challenges related to agricultural waste management. Circular bioeconomy offers a holistic approach to managing agricultural waste by turning it into valuable resources, thus closing the loop and creating a more sustainable and circular system. This project has been initiated to assess the footprints of smallholder coconut and corn farms in the region with respect to the sustainable development goals of zero hunger and sustainable production and consumption. The project ultimately aims to develop a community-based bioeconomic model that can inform policymaking in the Caraga Region. The evaluation is proposed to be done with the use of procedures examining the efficiency of the farming processes and practices of corn and coconut in the region. Materials flow analysis, data envelopment analysis and life cycle analysis (cradle to gate context) of corn and coconut will be used in determining the environmental footprints of the farm processes. The results will be used to extend the analysis on the potentials of curbing the negative externalities (e.g. greenhouse gas emissions, excess energy, land transformation, auto-pollination and biomass waste) through reuse or valorization strategies and innovations towards the development of circular bioeconomy based on the said potentials, the gaps in terms of information, technical, social and economic support will be assessed to chart the way forward for the goal of circular bioeconomy development. The project is anticipated to positively impact the region and the country by offering valuable policy insights for the advancement of sustainable agriculture in corn and coconut and its related environmental policymaking. This will help guide development and investment decisions towards a more environmentally friendly and economically viable future. | Publication: At least one (1) draft paper to be published in a refereed journal/At least one (1) policy brief/At least one (1) video explainer to complement the policy framework, resolution, and sustainability plan for the bioeconomy model adoption<br>Process/Product: One (1) database of farm information, input use, outputs, gaps, footprints, waste, and externalities. It includes the evaluation and illustration of these complex interrelationships/One (1) Process Documentation/Documentation of practices and ways of managing waste and externalities/Places and Partnerships: At least one (1) partnership forged with a farmer cooperative/At least five (5) MOUs will be prepared with LGUs in the implementation of the project/At least one (1) student advised for his/her thesis/At least one (1) knowledge sharing conducted with LGUs and other stakeholders (farmers' cooperatives, NGOs, and research institutions) project/At least one (1) stakeholder consultation conducted to involve relevant parties in developing the bioeconomy policy framework/Policy/Partnerships: Policy framework and strategies in adapting circular bioeconomy model/At least one (1) Resolution shall be endorsed to the Department of Agriculture-Caraga for the adoption of the framework in the region<br>Development/Partnerships: At least one (1) comprehensive sustainability plan shall be included to ensure the long-term viability of the circular bioeconomy model/bioeconomic impact: Strengthened the supply chain for renewable bioenergy—Developed sustainable production and consumption across the agri-supply chain/Economic Impact: Green agri-supply chains—Transition of green jobs and markets—Expedited transition to renewable bioenergy | Caraga State University (CarSU)                | The target beneficiaries of the project are the: ANR stakeholders (e.g. farmers, fishers, indigenous people) — Local agri-supply chains and chain actors (e.g. farmers, farmer-traders, consolidators, etc.) — Local entrepreneurs — Policymakers— Regional planners   | 01-Aug-24 | 31-Jul-26 | ONGOING                         | 5,000,000          | 2,800,000.00     |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---|---|---|--|--|--|---------------|-----------|---------|----------------------------------|--------------------|------------------|
| Assessing and Accelerating: Towards the Full Implementation of the FAO Small-Scale Fisheries Guidelines in the Philippines      | Rapid, inclusive and sustained economic growth                            | In the Philippines, municipal, or small-scale fishing, makes important contributions to food and nutrition security, and livelihood. However, it faces threats that have intensified through the years, including displacement, degraded resources, climate change, among others, which contribute to poverty, inequality, and their demise. Against this backdrop, the Voluntary Guidelines for Securing Sustainable Small-scale Fisheries in the Context of Food Security and Poverty Eradication (the SSF Guidelines), a product of negotiations by many stakeholders, was released in 2014 to guide interventions in small-scale fisheries to eradicate hunger and promote sustainable development. Although there were initiatives and researches to improve SSF situation, implementation gaps remain and advances were disrupted by the pandemic. In Asia, the Philippines is the first to mobilize the drafting of National Plan of Action for SSF Guideline starting 2023 but is facing funding issues. This study mainly aims to recommend enabling policy and institutional mechanisms to enhance and accelerate the adoption of the SSF Guidelines.   | Publicatorof two policy briefs, which may cover topics on: Raising awareness and accelerating the implementation of SSF Guidelines 6. The SSF Guidelines Implementation Strategies in the Philippines 6.Policy, legal, and institutional frameworks relevant to the SSF in the Philippines 6.Video Explainer that will present the main results of the study Product 6.Enabling implementation framework for SSF Guidelines Places and Partnerships 6.Partnership with Tokei University and TBTI Japan, and stronger collaboration among members in TBTI PhilippinesPartnership with the local government units of 10 study sites 6.Partnership with the four SUSA are member-organization of the National Small-scale Fisheries Research and Development Consortium (aka TBTI Philippines); Partido State University, Batangas State University ARASOF-Nasugbu, Marikina State University at Naawan, and Central Luzon State College of Marine Science and Technology A Letter of Cooperation on a MOA will be forged with PAsU, BatStateU-ARASOF-Nasugbu, MSU at Naawan, and CSCASST once the project is approvedPeople ServicesAt least 100 participants in online roundtable discussions, including 5-8 participants from member organizations of TBTI Philippines6.Includes insights of at least 50 participants in the formulation of plans as results of FGD6. 100 participants provided with information on SSF guidelines and its guiding principles, as participants of validation workshop6.Provide technical services in the 10 study sites, particularly in incorporating study results in their local initiatives to implement SSF GuidelinesPolicy 6.Policy recommendations on enhancing the adoption of SSF Guidelines6.Impacts to amendment of RA 10054 amending Philippine Fisheries Code of 1998Social Impact: — Better understanding of SSF in the country — Respect for the rights of the SSF in the country — Improved gender equality— Improved implementation of SSF Guidelines in the country | University of the Philippines Visayas (UPV)    | Fishers, policy makers, government agencies, researchers, development workers, fisheries managers  | 01-Jul-24     | 31-Dec-25 | ONGOING | 5,000,000                        | 3,705,032.32       |                  |
| Assessment and Valuation of the Ecosystem Services of the Pantabangan-Carranglan Watershed Forest Reserve                       | Integrity of the environment and climate change adaptation and mitigation | The Pantabangan-Carranglan Watershed Forest Reserve (PCWFR) is a critical watershed that contributes significantly to the provision of ecosystem services in the northern part of the Philippines. Recognizing this, the project aims to conduct a holistic assessment and valuation of key ecosystem services to support the development of a sustainable financing mechanism for the PCWFR. Specifically, the project aims to assess the ecosystem extent, conditions, ecosystem services, benefits and beneficiaries of PCWFR, characterize the different stakeholders, estimate the value of ecosystem services provided by the PCWFR, evaluate the potential of PES as a conservation financing scheme for the PCWFR, and provide specific recommendations for sustainable management of PCWFR. These objectives will be accomplished through watershed characterization, land use and land cover analysis, focus group discussions, key informant interviews, stakeholder and institutional analyses, modeling, and market and non-market valuation techniques. Among the outputs of the project will be publications in refereed journals, policy brief, ecosystem accounts of PCWFR, IEC materials on PES, description of PES potential of PCWFR, capacitated POs and partners (NLSU, PAMB, DENR) and recommendations for PA management and for the institution of PES and other conservation financing schemes in the Philippines. The project's potential impacts include poverty reduction in upland communities (SDG 1), sustainable management of water resources (SDG 6), forest restoration and biodiversity conservation in PCWFR (SDG 15).   | 1. Publication a. At least two (2) articles ready for publication in refereed journals b. At least one (1) Policy Brief c. At least one (1) brochure or poster on PES2. Product a. Ecosystem Accounts of Pantabangan-Carranglan Watershed Forest Reserve b. Capacitated POs and partners (NLSU, DENR/PAMB, NGO, POs and academe on the use of valuation tools and PES 3. At least two (2) trained undergraduate (BS) and two (2) graduate (MS/PhD) students c. Involve and train at least one (1) GRAT scholar, Places and Partnerships a. Partnership with NLSU (MOU only for staff involvement) b. Partnership with PAMB/DENR and LGUs, Policies a. Local level (municipal) and national level recommendations for the institution of PES and other sustainable financing mechanisms in the Philippines b. Policy recommendations for PA management  | University of the Philippines Los Baños (UPLB) | Policy and decision makers, academe (students, faculty members, researchers), private organizations, local government units, government agencies (DENR, POs, upland communities (men and women)  | 01-Aug-22     | 31-Dec-24 | ONGOING | 5,000,000                        | 599,800.40         |                  |
| Building Rural Community Capacity Towards Resilience of the Mango and Coconut Livelihoods in Luzon                              | Poverty reduction and empowerment of the poor and vulnerable              | Agriculture is among the most vulnerable sectors to risks arising from climate variability and other non-climate forces such as political, socio-cultural, economic, or institutional circumstances. Risks create vulnerabilities that can potentially harm livelihoods and human well-being. To effectively manage vulnerabilities, it is imperative to build community adaptive capacity. Adaptation can be approached by reducing livelihood vulnerabilities through the collective actions of community stakeholders and adoption of technology innovations that can help manage such vulnerabilities leading towards livelihood resilience. The livelihood resilience framework analyzes and develops the livelihood strategies and capitals of marginalized and poor peoples, through social structures and processes that builds community capacity to achieve value well-being outcomes but in such a manner as not to degrade the natural resource base of livelihoods while reducing livelihood vulnerabilities. The proposal argues that social structures and processes that builds community capacity and engenders adaptation using appropriate SAT innovations, can pave the attainment of valued resilience development and well-being outcomes in rural farming communities with coconut- and mango-based livelihoods.   | Publication: One conference paper One publishable journal article or working paper Product: 2 General resiliency framework 2 Typologies of mango- and coconut-based livelihood systems People 6. At least 50 male farmers capacitated at least 50 women farmers capacitated Place: Established linkages with private, public, NGOs, and other stakeholders in Luzon (Camarines Sur, Isabela, Batangas, Laguna)Policy: 2 Policy recommendation/paper identifying the sociological factors that contribute to the sustainable production and resiliency of mango and coconut livelihoods Social Impact — Established linkages with government, private, public, NGOs, and other stakeholders — Capacitated men and women farmers. Economic Impact — Established resiliency framework for the sustainable development of the mango and coconut livelihood systems in rural communities. — Capacity building interventions, appropriate SAT innovation strategies, and technology delivery; innovations into the value chain; nodes lead to increased income, improved well-being and capabilities, reduced vulnerability, improved food security, and more sustainable use of natural resources.  | University of the Philippines Los Baños (UPLB) | Beneficiaries of the project will include policy makers, researchers of R&D agencies, development organizations, and ultimately, the citizens (men, women, children) in each target area.  | 01-Jan-23     | 30-Jun-25 | ONGOING | 5,000,000                        | 2,279,146.34       |                  |
| Comprehensive Gender Analysis of R&D Projects on Selected Commodities in the Agriculture, Aquatic, and Natural Resources Sector | Integrity of the environment and climate change adaptation and mitigation | The gender aspect of technologies, knowledge transfer, and decision-making support is often overlooked. There is a need for gender mainstreaming in every research and development program, which requires a comprehensive gender analysis. The Harmonized Gender and Development Guidelines (HGDD) sets the standards for gender-responsive projects to close the gender gap in agricultural and fisheries value chains. The project aims to conduct a comprehensive gender analysis on the Program (ISP) for the identified agriculture, aquatic, and natural resources (ANR) commodity industry also face the challenge of gender mainstreaming. The project argues that a comprehensive gender analysis of R&D projects on ISP key commodities will produce additional knowledge on genders specific to each key commodity, gender roles and needs, access and control to resources and benefits, and gender opportunities and constraints. Results will be useful for policy recommendations towards gender-responsive R&D projects.   | Expected Outputs Publication — GAD Bulletin on gender issues and gender roles in ISP commodities — Article for publication in a journal on the status of gender in key commodity industries — Article for publication in a journal on recommendations towards gender-responsive R&D in key commodity industries — Article for PCAARRD Monitor on the findings of the project. Product — SDG of gender issues and gender roles for each ISP — Matrix of key commodity industry players with corresponding gender analysis concepts People and Services — Capacity building activity through basic GAD seminar during the FGD with men and women beneficiaries and/or ISP key players. Places and Partnerships — Established linkages with key commodity industry groups towards making the commodity industry gender responsive. The FGD and community workshops will be conducted with GAD handouts and basic awareness of GAD. This will institutionalize GAD among the households or communities of ISP commodity players. — Forging partnership with PCAARRD NARRON to ensure that gender analysis outcomes will be used for policy direction. Policy — Policy recommendations towards gender-responsive R&D in key commodity industry. Economic Impacts 1. Results of the project may instigate policies and concrete actions to enable better employment and social access to both men and women in the ANR sectors. Social Impacts 1. Sex-disaggregated data on issues, roles, needs, constraints, and opportunities lead to reliable guides and interventions addressing gender issues and causes, creating opportunities for gender equality and women empowerment. 2. This project will also impact to the R&D proponents since they will be using projects' output as well as to the men and women beneficiaries of PCAARRD-funded projects.   | Central Luzon State University (CLSU)          | — Policymakers, researchers, and project leaders of R&D agencies, — Development organizations — Citizens (men, women, children) in each target areas.  | 01-Aug-23     | 31-Jan-25 | ONGOING | 5,000,000                        | 506,588.00         |                  |
| Decision Support System for Effective Lake Governance of the Twin Lakes of Sibulan, Negros Oriental, Philippines                | Rapid, inclusive and sustained economic growth                            | Lakes as a natural resource are essential for their biodiversity support, freshwater supply, ecosystem services, climate regulation, role in habitat connectivity, recreation and tourism potential, and aesthetic value. Despite these, studies on lakes in the Philippines still remain few and are focused mainly on the well-known lakes. Most of these researches are concerned with the biophysical properties and biodiversity while there are hardly any studies that investigate the cross-section of human-environment interaction and issues of the communities, which may be due to lack of reliable and updated databases. Management plans of lakes appear to have been less effective because of inadequate consideration of human-environment interaction. Studies show that plans are unresponsive to dynamic contextual challenges and issues of the communities, which may be due to lack of reliable and updated databases. Understanding the human-environment interaction will better guide the development of management plans for lake ecosystems. This study will replicate the previous project on San Pablo lakes that is currently developing a decision support system to aid the governance of the lakes. It aims to examine the evolution of governance system and institutional arrangements in relation to the management and conservation of the Twin Lakes of Sibulan in Negros Oriental. This study aims to develop a decision support system particularly for the twin lakes of Sibulan to guide communities and development-oriented agencies in managing Lakes Balinsasayao and Davao. To understand the governance aspect, the study will use the Adaptive Integrated Lake Basin Management framework of Cooley, Damsawaddi, and Ratanachai (2016). | Publications6Two (2) draft scientific journal articles 6One (1) IEC material 6One (1) DSS user manual 6One (1) policy brief6One (1) video explainer 6.5 minivideo/Products 6Decision support system6Knowledge sharing platforms (website/Places and Partnerships6MOU with relevant stakeholder group (PAMB, LGUs, POs)People Services6Training workshop with LGU representatives and other stakeholder groups on the use of the decision support system6Knowledge sharing platforms6Policy 6Key inputs for the updating of the current development and management plans of the twin lakes 6Policy draft for the adoption of DSS6Social Impact — Strengthening of local partnerships among lake stakeholders (government and community) — Conservation of lake's water quality and their resources; Better organization and management of the national park's environment and its flora and fauna6Economic Impact — Improvement of the livelihood of the people within the twin lakes   | University of the Philippines Los Baños (UPLB) | — Municipal Local government units (Sibulan, San Jose, Valencia) — Provincial Government of Negros Oriental — Lake FARMCOs — Relevant local people's organizations — Department of Environment and Natural Resources (DENR) — Protected Area Management Board of Balinsasayao Twin Lakes National Park (BTLNP PAMB) — Scientific community | 16-Jun-24     | 15-Jun-26 | ONGOING | 5,000,000                        | 2,903,743.65       |                  |
| Developing and Piloting LGU-based Natural Capital Accounting for Improved Governance and Management of Community Natural Assets | Integrity of the environment and climate change adaptation and mitigation | Conventional and practical wisdom dictate that planning and management cannot be effectively and efficiently done without accurate and timely information. This is particularly true for LGUs that have been mandated with the primary responsibility of managing their community's natural assets. As natural resources are utilized for various purposes due to population and economic pressure, there has been an increasing concern for sustainable management of resources. It is within this context that LGU-led natural capital accounting is highlighted, to assist in effectively planning, managing, and ultimately governing the community. It is through natural capital accounting (NCA) that ecosystem valuation that the balance between economic activities and environmental conservation is aided by data-driven decisions. At present, the National Economic and Development Authority together with Philippine Statistics Authority and Department of Environment and Natural Resources developed a Roadmap for the institutionalization of the NCA in the Philippines for 2022 to 2040. While natural capital accounts directly apply to the national scale, there should be a site-specific local application scale that is effort sustainable, timely, and useful for those that govern. Local-level accounts would capture the nuances of the conditions and situations of ecosystems, thus significantly enhancing the contribution of natural accounts to ecosystem health monitoring. It is more appropriate management, and identification of precise interventions for protection. Similarly, efforts to create local-level accounts support and are consistent with the pending PENCAS bill which is expected to become law.                                | 1. Publications a. Journal article b. Discussion paper c. Policy Brief2. Products a. Localized NCA framework b. Calculator c. Ecosystem health index d. Indexed ecosystem's inventory of natural assets in the community3. Places and Partnerships a. MOU on the adoption of the localized framework4. People and Services a. Trained representatives of LGUs and other stakeholder groups5. Policy a. Policy draft for the adoption of the localized frameworkSocial impacts — Strengthening of local partnership among stakeholders (government and community)6Economic impact — Improvement of livelihood of the people within the locality through data-driven ecosystem-based development planning  | University of the Philippines Los Baños (UPLB) | — Local Government Units — National government (PSA, DENR, NEDA) — Laguna Lake Development Authority — Private local organizations — People's Organizations  | 01-Nov-23     | 31-Oct-25 | ONGOING | 4,996,364                        | 1,260,932.00       |                  |



| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---------------|---|---|---|--|---|---|-----------|-----------|----------------------------------|--------------------|------------------|
|               | Developing Indigenous Entrepreneurship and Establishing a Gender-responsive Community-based Business Model and Integrated Farming System for the Alangan Mangan Community in Brgy. Canaan, Victoria, Oriental Mindoro | Rapid, inclusive and sustained economic growth                            | The project titled "Developing Indigenous Entrepreneurship and Establishing a Gender Responsive Community-based Business Model and Integrated Farming System for Alangan Mangan Community in Brgy. Canaan, Victoria, Oriental Mindoro" is one of the proposed recipients of the 3Ps Project of the DOST-PCAARRD. This 3Ps Project primarily aims to establish impact communities with different agro-ecological environments by improving their livelihood through the implementation of S&I interventions, particularly for agriculture, aquatic and natural resources. The Alangan Mangan community in the Municipality of Victoria is one among the communities selected as initial recipients for the implementation of community-based projects. An integrated farming system will be established in Bantinan which is a two-hectare land area for the production of agricultural commodities such as banana and vegetables while aquaculture and rice production will be at Canaan. It is expected that the Theory of Change could be realized by establishing a suitable approach for an enterprise development that will generate a sustainable livelihood for them.  | Product 6: Integrated Farming System - rice, tiapa, banana, and vegetables 6: Business model for integrated farming system 6: Four modules Training Program crafted for IPs on integrated farming 6: Sex disaggregated data base of the community 6: Farm inputs provided Places and Partnership 6: At least 5 partnerships/collaborations with women and men stakeholders and enabling players Publication 6: Draft at least one publication People Services 6: At least 100 capacitated women and men members of the Alangan Mangan community as well as other stakeholders 6: Four (4) women and men researchers trained in conducting business model development Policy 6: At least 1 policy recommendation to address constraints identified Economic Impact: The development and improvement of the production and marketing of target crops such as rice, banana, tiapa, and vegetables may result in higher production, productivity, and profitability of the community's agricultural production. Eventually, this will contribute to poverty alleviation in the community. Social Impact: The establishment of a gender-responsive community-based business model as well as community-owned institutions will not only provide a source of income for the community but also ensure food security while being able to maintain their cultural identity. This may result in better quality of life and improved well-being among community members. Lastly, as part of the PCAARRD Pusa sa Panaymanan Project, the establishment of the Alangan Mangan community as an impact community will demonstrate the importance of science and technology interventions in improving ANAR-based livelihoods and will allow the process to be replicated in other indigenous communities.  | Mindoro State University (MinSU)  | The target beneficiaries of this project include the following:<br><br>women and men members of the Alangan Mangan Community in Brgy. Canaan, Victoria, Oriental Mindoro<br><br>women and men Researchers<br>women and men Policy makers<br>LGUs  | 01-Jan-25 | 31-Dec-26 | ONGOING                          | 5,000,000          | 3,268,923.75     |
|               | Development of a Gender-Responsive Knowledge Transfer Pathway for Potential Adoption of Best Practices in Philippine Vegetable Production Systems   | Integrity of the environment and climate change adaptation and mitigation | The project complements the ACIAR-funded SLAM Project by providing enabling mechanisms for the adoption of the strategies generated by the SLAM project on vegetable crop and soil management that can optimize crop inputs, reduce soil loading of plant essential heavy metals, and enhance the quality of soil and pathogen management. The project is participatory action research and will employ mixed method approaches. Project sites are Leyte, Cebu, and Benguet.  | Publication: Two (2) publishable papers on any of the following topics/titles:- Empowering women's role in technology adoption through better knowledge transfer pathways Gender-responsive knowledge transfer pathways for key stakeholders Literature review on gender's role in technology adoption and knowledge transfer Product: Sex-disaggregated database People Services: One (1) Capacity-building activity for project team development: One (1) Gender-related training for farmer participants Places and Partnerships - Memorandum of Agreement (MOA) between cooperating agencies: (1) PCAARRD, (2) VSU, (3) UPLB, and (4) USTP Linkages forged with Institutions engaged in knowledge transfer: (1) Input suppliers, (2) Agricultural Offices, (3) Agricultural Training Institute (ATI) Three (3) Letters of Commitments signed by the Local Government Unit in Leyte, Cebu, and Benguet (one per site) - adoption of policy recommendations per site Policy  | Visayas State University (VSU), University of the Philippines Los Baños (UPLB), University of Science and Technology of Southern Philippines (USTP) | Male and female farmers in three project sites Project Communities Implementing universities in terms of improved research competence Project staff in terms of professional development  | 16-Nov-22 | 15-May-25 | ONGOING                          | 5,000,000          | 708,863.44       |
|               | Development of a Policy Coherence Framework for Access and Benefit Sharing and Fostering Equitable and Sustainable Lake Resource Management in Lake Sebu and Lake Seloton   | Rapid, inclusive and sustained economic growth                            | The governance of aquaculture in Lake Sebu and Lake Seloton is governed by multiple laws, including the Philippine Fisheries Code of 1998 (RA 8550), amended by RA 10654, the Local Government Code of 1991 (RA 7160), the National Integrated Protected Areas System Act of 1992 (RA 7586), amended by RA 11026, and the Indigenous Peoples' Rights Act of 1997 (RA 8371). These overlapping laws may lead to conflicts and challenges in governance, particularly regarding aquaculture management. There's not enough policy research on how well policies are put into practice in Lake Sebu and Lake Seloton's aquaculture industry, especially when it comes to policy coherence. This study aims to develop a policy coherence framework for equitable and sustainable aquaculture development in Lake Sebu and Lake Seloton. Primary data will be gathered through Key Informant Interviews and Focus Group Discussions complemented by secondary data review. Policy coherence analysis, SWOT analysis, and Policy Analysis Framework will inform the development of policy briefs and a draft ordinance. The results will contribute to enhancing aquaculture policy enforcement, improving resource users' quality of life, promoting good governance, and sustainable resource management, and facilitating access to benefits across Lake Sebu and Lake Seloton.   | Publications: 6:One (1) publication-ready paper 6:One (1) policy brief 6:One (1) 30-minute video explainer 6:One (1) advocacy kit including EXC materials tailored for specific audience/Products 6:One (1) compilation of the existing national, regional, and local aquaculture-related policies, laws, regulations, and programs related to Lake Sebu 6:One (1) documentation of the facilitating factors and issues/challenges of the current enforcement of aquaculture-related programs and policies in Lake Sebu and Lake Seloton 6:One (1) conceptual framework on the identified themes and their impact on enforcement effectiveness 6:One (1) screening matrix of the various aquaculture-related policies in Lake Sebu and Lake Seloton 6:One (1) policy coherence framework for access and benefit sharing and fostering equitable and sustainable development in aquaculture across Lake Sebu and Lake Seloton 6:One (1) advocacy plan outlining key messages, target audiences, communication channels, and strategies for influencing policy change 6:One (1) process documentation of advocacy/Places and Partnerships 6:One (1) Memorandum of Understanding (MOU) with the Local Government Unit (LGU) of Lake Sebu, South Cotabato 6:One (1) Technical Working Group to lead the drafting of the sustainable aquaculture-related ordinance/People Services: 6:At least one (1) graduate student (MS or PhD) working on the development of a policy coherence framework 6:At least one (1) undergraduate student working on the development of a policy coherence framework 6:At least one (1) seminar and workshop conducted with not less than 30 participants per session 6:At least one (1) roundtable discussion/Policy 6:One (1) draft ordinance on the coherence of aquaculture-related policies for access and benefit sharing and fostering equitable and sustainable development in Lake Sebu and Lake Seloton Social Impact: - Resilient and Cleaner Nature & Environment - Promotion of Good Governance for the Lake Resources/Economic Impact: - Sustainable Resource Management and Livelihood | Mindanao State University - General Santos City (MSU-GSC)   | The target beneficiaries of the project are: - Local Government Unit of Lake Sebu - Bureau of Fisheries and Aquatic Resources - Department of Environment and Natural Resources-Protected Area Management Bureau - National Commission on Indigenous People - People of Lake Sebu, South Cotabato   | 01-Sep-24 | 31-Aug-26 | ONGOING                          | 5,000,000          | 1,752,708.30     |
|               | Development of an LGU-led Supply Chain Management System for Selected Vegetables  | Integrity of the environment and climate change adaptation and mitigation | Supply chain management is a concept that aims to synchronize the customer requirements with the goods and services being provided by suppliers resulting in a more efficient supply chain, minimizing the supply-demand gap and providing more benefits for the key stakeholders (Stevens, 1989). It has been a long-standing issue in the vegetable industry that supply chains are poorly coordinated, wherein customer needs and available supply of goods are not matching. This leads to localized supply shortages and highly volatile prices of vegetables. The same cases can be observed in the municipality of Magajay, a major producer of vegetables in Laguna. Thus, an LGU-led supply chain management system will be developed for the smallholder vegetable farmers in Magajay with the mentorship of the UPLB-DAME.   | Publications - At least two (2) articles based on the results of the project (including one policy brief) Products - Intervention/strategy models, supply chain management system, inventory system, database of key players in vegetable industry in Magajay, Laguna; supply chain management operations manual, production manual, Places and Partnerships - At least (10) partnerships/linkages established with LGU, producer groups, institutional buyers, and other value chain actors People and Services - At least 100 men and women farmers and LGU staff directly capacitated from the project/Places - Policy recommendation to be distributed in the LGU of Magajay, vegetable farmers/associations, and key institutions working on vegetables to further the growth of the industry; - Municipal ordinance institutionalizing the vegetable supply chain hub/Economic Impact - Higher income - Improved competencies of farmers - Livelihood improvement - Improved marketing strategies/Social Impact - Improved backward and forward linkages - Higher involvement of the LGU in the industry   | University of the Philippines Los Baños (UPLB)  | The target beneficiaries of the project include women and men vegetable producers, policymakers, R&D agencies, and service providers.   | 01-Jul-23 | 31-Dec-24 | ONGOING                          | 5,000,000          | 1,349,849.81     |
|               | Development of Traceability System for Cacao in Southern Philippines  | Rapid, inclusive and sustained economic growth                            | Given that there is a need to address the consumers' concerns about food safety due to the increasing demand for cacao products, the development of a transparent traceability system is timely and important. Anchoring on the PCAARRD-funded study titled, "Supply Chain Management Cacao Agro Logistics in the Southern Philippines Context", this study aims to develop a Transparent Traceability System (TTS) for Cacao in Southern Philippines. The project will focus on the development and application of the transparent traceability system to the cacao industry to (1) help the key players increase or strengthen their competitiveness in terms of quality of beans and compliance with food safety standards, (2) establish linkages, and (3) widen their markets. It will utilize the results/outputs of the supply chain analysis done in Phase 1, including the critical trading events (CTEs) and key data elements (KDEs). In addition, it will be supplemented with secondary data to trace and track the product from its point of production up to its consumption. As a tool for transparency, accountability, and reliability, the traceability system can address concerns by providing relevant information to industry players where in the long-run, industry players should benefit from efficiencies and sustainability that the project may bring as cited in many recent studies on traceability. The study will be conducted in five stages following the Analysis, Design, Development, Implementation, and Evaluation (ADDE) framework. In stage 1, a system requirement will be conducted to gather, update and check necessary items for the system. The 2nd stage will determine the appropriate framework/algorithm matching the requirements gathered in stage 1. Stage 3 is on the development of the system, while stage 4 is on the implementation of the traceability system. The final stage of the study will be the turnover of the system and the conduct of monitoring and evaluation | Publication: At least one (1) article discussing how the traceability system can help improve the competitiveness of the cacao in the international markets Places: One (1) utility model application Product: -One (1) Transparency Traceability System (TTS)-One (1) framework for the TTS-At least one (1) traceability protocol for the cacao production, manufacturing of cacao products, and distribution People Services: At least 100 cacao farmers trained on how to use the traceability system with at least nine (9) farmers and other key players directly involved for the pilot testing of the traceability system Places and Partnership: One (1) Memorandum of Agreement with an industry partner (Kemenne Food International) to serve as the TTS employer At least three (3) consultation meetings with the stakeholders Policy: One (1) institutional policy on traceability/Social Impact - Increased awareness of the cacao farmers on the importance of food safety and traceability system in the cacao products. - Improved practices of cacao farmers and other key players/Economic Impact - More competitive cacao industry with an established traceability system - Sustainable cacao production in the Davao region   | University of Southeastern Philippines (USEP)   | The scope of this study will be the players of the supply chain in Region XI. Primarily it will include farmers, and the corpora buyers (KFL Buyer cooperatives) involved in the production, trading, and manufacturing of Cacao in Region XI. -Kemenne Foods International and its cacao farmers, and similar farmer cooperatives/associations or companies in the Philippines -Manufacturing factories and their auditors -Consumers who are using the product in their daily life -Policymakers, program planners, and researchers working on cacao industry development | 16-Mar-23 | 15-Mar-25 | ONGOING                          | 5,000,000          | 2,025,545.55     |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---------------|---|---|--|---|--|---|-----------|-----------|----------------------------------|--------------------|------------------|
|               | Empowering Private Extension Workers to Lead Sustainable Supply Chain Management in Vegetables and Fruits   | Rapid, inclusive and sustained economic growth                            | Building on the success and drawing out lessons from the various experiences of ANIH in establishing supply chain management systems, this project is directed to develop and pilot a private-sector led model. The ARIAs would be working directly with a network of smallholder farmers providing them with inputs, training, and consolidation areas for easier aggregation and distribution to different markets. Their role will be expanded from being a private-sector extension service provider to also perform active supply chain coordination. Different marketing channels would be explored by facilitating marketing linkages for the group of farmers under their network. This initiative aligns with the ANIH's mission to develop sustainable, resilient, and inclusive value chains for agriculture, aquatic, and natural resources (ANRS) sector, contributing to broader economic development and community empowerment in Laguna's agricultural sector.   | Publication: At least one (1) draft article / research publication developed — At least one (1) policy brief developed — At least one (1) documentation of Posing Process of the aGAP supply chain management model — Interagency model Product — Supply Chain Management System; Marketing system; Database of key players in vegetable and tropical fruits industry in selected municipalities in Laguna; Operations manual — Sustainability plan People 60A at least five (5) modules developed/enhanced based on the project across the five municipalities/Place 60A at least five (5) partnerships forged with LGUs/60A at least three (3) partnerships forged with producer groups 60A at least 10 partnerships forged with buyers and other value chain players/Policy 60A at least one (1) policy recommendation to be distributed and presented to the LGUs, smallholder farmers and key stakeholders working on vegetables and tropical fruits for the growth of the industry/Social Impact/60 improved backward and forward linkages for the producer/60 higher involvement of the LGU in the industry 60 improved access to safe vegetable and tropical fruit of consumers in Laguna and other areas covered by the supply chain/Economic Impact/60 higher income of the smallholder farmers 60 improved competitiveness of the farmer/60 method improvement of vegetable and tropical fruit farmer 60 improved marketing strategies for the producers   | Southern Luzon State University (SLSU)         | The study will cover selected municipalities in Laguna including Famy, Mablac, Sta. Maria, Pangil and Siminon. These are the low-income class municipalities that rely heavily on agriculture-based livelihoods. Within these areas, small-scale farmers face challenges such as costly and/or unreliable access to farming inputs/resources, technology, and markets for their produce. Additionally, these areas frequently encounter crop failures due to the impacts of natural disasters like droughts, floods, and typhoons. The direct and indirect beneficiaries of the project are: — Smallholder Vegetable and tropical fruit producers — Relevant value chain players (traders, institutional buyers, etc.) — Local Government Units — Indirect beneficiaries are the consumers, who are utilizing the produce in their daily lives.   | 01-Nov-24 | 30-Apr-26 | ONGOING                          | 5,000,000          | 3,413,223.00     |
|               | Enhancement of Implementation Readiness and Integration of the R2RWEM into the Provincial Development and Physical Framework Plan (PDPFP) of the Province of Bataan | Rapid, inclusive and sustained economic growth                            | The proposed project supports the enhancement of a conducive environment for the robust preparation and implementation of land use and development plans utilizing the Ridge-to-Reef/Waterlines Ecosystem Management (R2RWEM) approach. It is supplementary to the capacity-building activities initiated in the project Externalization of Guidelines on Watershed-Based Integrated Area to Land Use Planning Towards Resilient and Sustainable Development (WATERLINE) and the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (DOST-PCAARRD). Its main objective is to build the capacity of provincial and municipal planning officers of Bataan in utilizing the R2RWEM approach in land use and development planning. Moreover, State Universities and Colleges (SUCs) in the Central Luzon Region offering Forestry and Environmental Science courses, along with key Government Agencies in Region III, will benefit from the training program to develop their knowledge and technical skills in the R2RWEM approach. It is expected that the project will pave the way for the implementation of a nationwide capacity-building program and mentoring on the utilization of the R2RWEM approach to land use and development planning through collaboration with various key government agencies.  | Publications: 60 One (1) Documentation Report on the current processes by the Bataan PLGU in the formulation of the PDPFP/60 One (1) Process Documentation Report of the capacity-building activities/60 Copyright application for the modules that will be developed and utilized by the project/60 A at least five (5) modules developed/enhanced based on the training needs assessment of the province of Bataan and the developed WILUP Cap Dev modules for Region I 60A at least two (2) process map/flow chart of the integration of the R2RWEM approach to the land use and development planning in the province of Bataan; application of GIS, and/or Risk and Vulnerability Assessment for Soil and Water Management using SWAT and HEC-RAS/60A at least ten (10) module projects developed by the participants, applying the lessons learned from the training, seminars, and webinars using the Guidelines on PLFEM and R2RWEM approach/People Services 60A at least 10 participants engaged in the seminar to promote/allocate WILUP in Bataan/60A at least 10 participants comprising the planning team, municipal officers, LGUs in the province and SUCs capacitated. These participants will be engaged across all municipalities and Partnerships 60A at least three (3) training modules/key National Government Agencies (NGAs), Local Government Units (LGUs), or State Universities and Colleges (SUCs) forged/Policy 60A at least one (1) signed ordinance or resolution on the commitment to adopt the ridge-to-reef approach in land use planning and development/Recommendations based on the challenges encountered during the capacity-building program provided/Social Impact: — Reduced disaster risks and damages due to hazards; — Enhanced human security; — Mitigate climate change; and — Sustainable development of communities in the watershed/Economic Impact: — Increased potential investments from public and private sectors; and — Optimum and sustainable use of natural resources resulting in maximized agricultural land productivity and creation of sustainable income-generating recreational and ecotourism activities.   | University of the Philippines Los Baños (UPLB) | The training and mentoring will mainly target the Provincial Planning and Development Office (PDDO)/Provincial Planning and Development Coordinator's Office (PPDO) of Bataan, concerned provincial planning offices, and selected state universities and colleges (SUCs), namely: — Provincial Government Environment and Natural Resources Office (RGENRO) — Provincial Agriculture Office (PAO) — Provincial Agrarian Reform Office (PARO) — Provincial Disaster Risk Reduction Management Office (PDRMO) — Provincial Land Use Committee (PLUC) — Pampanga State Agricultural University — Ramon Magsaysay Technological University — Bolton Campus — Tarlac Agricultural University — Aurora State College of Technology — Nueva Ecija University of Science and Technology — Main Campus — Bulacan Agricultural State College — Dona Remedios Trinidad — Aurora State College of Technology. Bataan Municipal planners from the 12 LGUs (11 municipalities and 1 city) in Bataan will also be invited to the training on the use of PDPFP as its reference framework in updating its CLUPs, GDPs and other prescribed development plans, using the R2RWEM approach. This will involve planners and concerned personnel from the Municipal Planning and Development Office (MPDO). | 01-Jul-24 | 30-Jun-25 | ONGOING                          | 5,000,000          | 5,000,000.00     |
|               | Enhancing Competitiveness of Coconut-Based Enterprises in Eastern Visayas: Business Model Innovation through Dynamic Capability and Co-creation Approach            | Poverty reduction and empowerment of the poor and vulnerable              | The Philippine Coconut Farmers and Industry Roadmap (2021-2040) of the Philippine Coconut Authority and the Coconut S&T Roadmap (2022-2028) by DOST-PCAARRD underscore strategies towards a Coconut S&T Roadmap (2022-2028) that involves introducing value-adding activities, enhancing non-traditional coconut products that can compete in domestic and international markets, and strengthening coconut farmers' organizations/enterprises. However, to thrive in the era of rapid technological advancements, increased competition, and shorter product life cycles, these enterprises must design and refine their business models to remain competitive in a dynamic business landscape. A business model, in essence, is the conceptual structure supporting an enterprise's viability, covering its purpose, operations, target market, value addition, and revenue generation. To date, there are 128 coconut farm enterprises in Eastern Visayas. However, many of these coconut enterprises have stagnated in their growth and continue to face significant challenges, including scaling their operations, penetrating larger markets, and achieving long-term sustainability in doing so. Incorporating co-creation processes, where enterprises actively involve customers in the creation of services, products, and processes in the business model of coconut farmers' enterprises is crucial for creating and capturing superior value from customers. Embedding the co-creation process in business model innovation ensures enterprises remain responsive and customer-centric. Most importantly, enhancing organizational capabilities to activate these business models effectively is essential. Strengthening dynamic capabilities (flexibility, adaptability, and continuous learning) is vital for responding to market changes and leveraging new opportunities. With this, the project aims to assess the existing organizational capabilities of selected coconut farmers' organizations/enterprises in Eastern Visayas, identify gaps in their dynamic capabilities, real-time market research for value-added coconut-based products, and redesign business models through a co-creation approach. Deploying interventions to enhance dynamic capabilities and activate co-creation processes will increase resilience, foster innovation, and strengthen customer relationships, ultimately leading to greater market success and growth for coconut-based enterprises in the region, consequently empowering the women and men coconut farmers in the region. | Publication: 60 One (1) SCOPUS-indexed publication/Product: 60 Database of the target Coconut Farmers Organizations/Enterprises 60 Three (3) Lean Canvas and Business Model Canvas Developed 60 Three (3) Business Plans Developed 60 Three (3) Training modules covering entrepreneurship, organization and management, and dynamic capability enhancement/People 60A at least ninety (90) participants, both women and men capacitated in the following aspects: business model and entrepreneurship, management capacity enhancement (e.g. basic organization and management, market research, entrepreneurship, operations management, marketing, financial management), dynamic capability enhancement training (e.g. design thinking, market research, digital literacy, negotiation, customer relationship management, networking, and relationship building), and co-creation dialogued workshops with network partners for business model development/Places and Partnerships 60 Three (3) Partnership agreements (MOUs/MOAs) with network partners: chambers of commerce, government agencies, academe, and other relevant VC players, LGUs, CFOs/Policy 60 One (1) policy recommendation/Social Impact/60 expansion of formal and informal networks through co-creation workshops/60 Strengthening of collaboration and relationships with organizations, LGUs, and stakeholders. 60 Fostering enhanced information exchange, resource sharing, and problem-solving. 60 Enabling CFOs to innovate business models and adapt to market changes. 60 Improvement of decision-making, communication, and accountability within CFOs. 60 Increase in community involvement and strengthens relationships with local stakeholders/60 Increase in social cohesion and community resilience/Economic Impact/60 Access to new local and international markets for coconut products. 60 Favor offerings of CFOs to meet consumer preferences and market trends. 60 Promote the development of value-added coconut products. 60 Drive revenue growth through innovation and improved business models. 60 Empower CFOs to scale operations, invest in new technologies, and improve working conditions. 60 Create a sustainable cycle of growth within the coconut industry. | Visayas State University (VSU)                 | The target beneficiaries of the proposed project are the following Coconut Farmers Organizations (CFOs): — Katipunan ng mga Maliliit na Magninipng sa Pilipinas (KAMMPL) — Buraun, Layla Chapter — Nava Settlers Multi-Purpose Cooperative — Canila Agrarian Reform Cooperative (CARCO)   | 01-Jan-25 | 31-Dec-26 | ONGOING                          | 5,000,000          | 2,584,975.00     |
|               | Enhancing the Development and Growth of Seaweed-based Enterprises in Sorsogon (EDGE)  | Integrity of the environment and climate change adaptation and mitigation | Sorsogon was historically one of the major producers of wild stock seaweeds in the Philippines and was the pioneer of seaweed farming in the Biolod region. However, in the past two decades, the production of seaweed in the province has been continuously declining. The industry is hampered with various issues throughout the different stages in the value chain, such as lack of low-cost quality seedlings, poor post harvest practices, limited equipment, disorganized farmers, limited market access, and lack of credit access. With the growing demand for seaweed products globally, it presents an opportunity to revive the industry in the province by helping the seaweed farmers and other value chain players in developing viable enterprises. In this project, appropriate interventions will be identified and applied to address issues and tap opportunities for the development of viable enterprises in the seaweed value chains. Geomapping the seaweed farms will be conducted to assess the resource capital and characterize existing seaweed farms in the province. This is important since environmental pressures like typhoons can cause seaweed value chain vulnerabilities and disruptions. Consequently, this project will focus on addressing the value chain challenges faced by the seaweed-based enterprises whose livelihood are vulnerable to natural hazards. A key factor concerning the future economic impacts of the seaweed industry in the province of Sorsogon is the need to identify which communities are most vulnerable to natural disasters that can affect their livelihood. This study seeks to support the vulnerable seaweed farmers in improving their livelihoods by developing and implementing intervention strategies to address the specific needs of the industry and their farm enterprises. These may include capacity building, market and institutional networking, forging partnerships with relevant players in the value chain, developing local industry player databases for the benefit of the local seaweed enterprises among others. In addition, a policy brief will also be made that will highlight key and actual challenges facing seaweed production in Sorsogon and recommendations promoting sustainability of this important industry in the province. The intervention designs will be geared towards the growth and development of the production and operations of the key players in the seaweed industry.   | Publication: At least one (1) draft article for publication in highly regarded peer-reviewed journals. One (1) policy brief/Product: One (1) geo-map database to be easily accessed by various stakeholders, a database of seaweed producers and consolidators/People: At least 10 seaweed farmers and processors directly benefited from the intervention/Places and Partnership: At least 10 partnership agreements with LGUs, seaweed farmers, key players in the value chain, government agencies (e.g. BPAR), and international partners. Policy: A policy recommendation to be distributed among LGUs in Sorsogon, seaweed farmer/associations and key institutions working on seaweed to further the growth of the industry/Social Impact/Creation of livelihood opportunities for the industry/Creation of livelihood opportunities for the industry/Creation of livelihood opportunities for the industry/Economic Impact/Creation of livelihood opportunities for the industry and socially marginalized rural coastal communities/Economic Impact/Creation of livelihood opportunities for the industry and socially marginalized rural coastal communities. The information that will be generated will help seaweed farmers, cooperatives and policy makers to address key challenges on how to improve production and market.   | Sorsogon State University (SorSU)              | It is estimated that at least 81 men and women seaweed farmers belonging to three (3) seaweed producer groups will benefit from this study. As indirect beneficiaries, the LGU, academe and policy makers within the province may benefit from the replication and/or scaling of interventions.   | 01-Oct-22 | 30-Sep-24 | COMPLETED                        | 5,000,000          | 1,013,074.60     |



| 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, 2024 | Total Project Cost | 2024 PCAARRD GIA |
|---|---|--|--|--|--|---------------|-----------|---------|---------------------------------|--------------------|------------------|
| Gender Analysis of AANR Technology Development Processes Towards Gender-Responsive Standards, Protocols and Assessment Tools    | Rapid, inclusive and sustained economic growth                            | The Philippines has long subscribed to the principle and practice of gender mainstreaming to address issues of gender inequality and harness women's empowerment, in all aspects of society. Hence, government institutions such as PCAARRD have endeavored to mainstream gender in its operations, including project development in the agricultural, aquatic and natural resources (AANR) sectors, where various studies have emphasized differences in women's and men's roles. Technological innovation, including machine development, in these sectors is not free from gendered assumptions about prospective users and the contexts for their technology utilization. Preconceived notions on gender roles impact on how technology is conceptualized and developed, perhaps more so in resource-based settings. Using gender analytical frames and gender-sensitive research methods, this proposed 2-year project would like to develop enabling mechanisms to make AANR technology development processes more gender-responsive. It specifically would like to: (1) conduct gender analysis of AANR technology development processes (benchmarking and conceptualization, product and standards, testing and refining, deployment and diffusion); (2) review commonly-used standards, protocols or assessment tools in AANR technology development processes and categorize whether they are gender-blind, gender-neutral, gender-sensitive or gender-responsive; (3) identify gender gaps and entry points for gender mainstreaming in AANR technology development processes; (4) make recommendations for revision of various ThA tools to improve their gender-responsiveness; and (5) pilot-test selected improved and more gender-responsive standards, protocols and assessment tools for technology projects in AANR. Project outcomes are expected to enhance PCAARRD's gender mainstreaming efforts in AANR sectors. | Publication: At least one article for journal publication; At least one conference paper/Product: At least one Gender Analysis Report for selected AANR technology development processes; At least one gender-responsive technology protocols and assessment tools; At least one GAD Bulletin detailing the importance of mainstreaming gender in technological processes; People Services/Engagement with at least 20 female and male project implementers, technology end-users and LGU personnel; Highlighting the community differential gender needs of at least one study site; Promoting inclusivity in technology use in at least one study site; and Partnerships: At least one draft MoA for researchers / proponents of technology projects per TTPD modality; At least one draft MoU for researchers and each of the identified LGUs that will serve as study sites; Policy: At least one policy brief on how to make AANR technology development processes more gender-responsive; Social Impact: The project will ensure that gender sensitivity is mainstreamed even in AANR technology processes, thus contributing overall to the country's commitment to gender equity and equality goals. Economic Impact: Developing gender-responsive technologies using this proposed project's output will rebound to wider and more inclusive technological utilization in the AANR, which will in turn positively impact productivity in these sectors.   | University of the Philippines Visayas (UPV)    | The target beneficiaries of this proposed research will be female and male prospective proponents of AANR technology projects, as well as the female and male end-users of developed AANR technologies.  | 16-Jun-24     | 15-Jun-26 | ONGOING | 5,000,000                       | 2,649,083.00       |                  |
| Gender Impact Assessment of Forest Conservation Projects among Indigenous Peoples in Luzon, Philippines                         | Integrity of the environment and climate change adaptation and mitigation | This project assesses the gender impacts of forest conservation projects introduced to indigenous peoples (IP) in Luzon. It focuses on four indigenous peoples, namely, the Kalingaynagan, and Iraya-Ayngan of Nueva Vizcaya, Aeta of Nueva Ecija and Mislog of Palawan. This research conducts a Gender Impact Assessment (GIA) on forest conservation projects, including the National Greening Program (NGP), and watershed management involving watershed and assessment of ecosystem services. In conducting GIA, this project analyzes: (1) gender-disaggregated socio-economic impacts of forest conservation projects on indigenous peoples; (2) gender gaps experienced by these initiatives in terms of access, control and benefits and opportunities, participation in decision-making, leadership positions, and employment status; and (3) policy recommendations to close gender gaps and improve the project design and delivery to promote gender empowerment in forest conservation projects. It uses mixed methods, where both quantitative and qualitative tools generate gender-disaggregated data on: (a) roles and activities; (b) access and control; (c) practical and strategic needs; (d) decision-making participation; (e) gender impact on labor, time, resources, and socio-cultural factors; (f) influencing factors (economic, social, environmental and education); and, (g) level of equality and recognition of women's issues.  | Publication: (One (1) state of the art literature review on the selected indigenous peoples and their situations; One (1) concept of documented case studies on gender-specific impacts of forest conservation in selected research sites; At least two (2) journal articles on gender-specific impacts of forest conservation projects on indigenous communities; Product - One (1) information database system on the gender impacts of forest conservation projects among indigenous communities in the selected research sites; People and Services- Three (3) graduate students gaining support for their research work under PCAARRD assistance program - Six (6) undergraduate students gaining experience in conducting fieldwork in research sites; Four (4) IP guide/translators gaining work experience and involvement in the research activities; Twenty (20) survey enumerators from the researches gaining training and experience in conducting surveys; Four (4) LGU facilitators gaining mentorship and hands-on experience in conducting research; Partnerships: Four (4) partnership/linkage with LGUs, GAs, NGOs, POs, and selected indigenous peoples for selected research sites; Policy - One (1) policy brief on the relevance of studying gender-specific impacts of forest conservation projects on indigenous communities.   | University of the Philippines Los Baños (UPLB) | The target beneficiaries of this project are the men and women of the indigenous communities. The results of this research will also benefit the sponsoring GA and LGU as well as the participating PO and NGO as they learn from the lived experiences among men and women of the indigenous communities. | 01-Jul-22     | 31-Dec-24 | ONGOING | 5,000,000                       | 258,791.46         |                  |
| Harvesting Tomorrow: Envisioning the Futures of the Luzon Semi-Temperate Vegetable Industry by 2050 through Strategic Foresight | Rapid, inclusive and sustained economic growth                            | The Philippine Vegetable Industry has a big growth potential but is currently beset with many challenges. A major transformation is necessary to make it a resilient and sustainable sector. In a world of volatility, uncertainty, complexity and ambiguity, having foresight is not sufficient to navigate the future. Futures thinking and foresight become a necessary complement to the traditional planning process. The reactive responses to the challenges being experienced by the vegetable industry should be replaced by proactive policies. Problems and issues that have been avoided in the past for the sector had better be anticipated. It is not too late, however, to change things and reimagine everything so that we can be prepared to face a future that is bleak or so that we can move easily towards this preferred future for the vegetable industry. This study will reimagine the country's semi-temperate/highland vegetable industry and propose actions toward a future-proof sector, i.e. sustainable and resilient against the unknowns, shocks, and disruptions. Using a participatory strategic foresight tool such as Driver Mapping, Horizon scanning, Future Triangle 2.0, Scenario Building, Visioning, Increasing/Backcasting, this project aims to create a long-term plan for a future-proof vegetable industry in the next 25 years.  | Publications: One (1) Foresight report about semi-temperate vegetable industry; One (1) Policy Brief; At least one (1) journal article on the Futures of Philippine vegetable industry; People Services/ Stakeholder engagement and consultation: Fifty (50) stakeholders tapped to take part in foresight activities; Three (3) project team members attending the 10th Asia-Pacific Futures Network Conference in September 2024 in Bangkok, Thailand; and Partnerships: At least five (5) agencies or organizations engaged in the conduct of the foresight activities such as but not limited to presentation and dissemination of outputs. The partnership can be executed through a letter of understanding; Policy: Recommendations for specific preferred future scenarios for the Philippine vegetable industry; Product: One (1) roadmap toward a future-proof vegetable industry endorsed by PCAARRD IPF manager and other relevant agencies; People: Replication for copyright on all project reports and publications; Social Impact - The participatory process engages stakeholders in a collaborative process, therefore ownership of the vision for the vegetable sector. This can result in a more sustainable and equitable impact from programs and policies; Economic Impact - Potential impacts include being able to prepare the necessary preparatory steps to fully maximize the benefits of anticipated opportunities, mitigating losses from adverse events by identifying risks early, and increasing the potential for innovations. | University of the Philippines Los Baños (UPLB) | The semi-temperate/highland vegetable industry in the country, farmers, input suppliers, markets, local government units, national government agencies, and industries linked to the vegetable industry.   | 01-Nov-24     | 30-Apr-26 | ONGOING | 5,000,000                       | 2,008,591.95       |                  |
| Impact Assessment of the DOST R&D Program on Increasing Sea Cucumber Production and Value of Dried Sea Cucumber Products        | Integrity of the environment and climate change adaptation and mitigation | This study will determine the program's impacts and contributions to the growth and development of the sea cucumber industry. It will also provide policy recommendations that can improve the design and implementation of future R&D and technology transfer programs for sea cucumber.  | Publication: At least one (1) draft for the journal article. Product: Information about the status and/or subsequent use of outputs of the Sea cucumber R&D program information about the outcomes and the impacts of the Sea cucumber R&D program. People and Services: At least four (4) researchers capacitated in impact assessment; Policy: Policy recommendations for the improvement of the design and implementation of future R&D and technology transfer programs for sea cucumber; Social Impact: Improved employment opportunities because of improved sea cucumber-based enterprises; Economic Impact: Increased income of sea cucumber producers, hatchery operators, processors, and other participants in the sea cucumber industry; Increased competitiveness of the sea cucumber industry  | University of the Philippines Los Baños (UPLB) | Researchers R&D funding and implementing agencies; Policy makers; Fishers, processors/traders, and other stakeholders in the sea cucumber industry   | 01-May-23     | 31-Jan-25 | ONGOING | 5,000,000                       | 1,497,316.00       |                  |
| Impact Assessment of the National R&D Initiatives for Seaweeds with Focus on the DOST-funded Seaweeds R&D Program               | Integrity of the environment and climate change adaptation and mitigation | This impact assessment project aims to trace the utilization of the outputs and evaluate the impacts of the National R&D Initiatives for seaweeds with focus on the DOST-funded R&D initiatives implemented from 2012 to 2014. This will cover the three sub-areas with a total of nine (9) projects implemented across the three main islands of the Philippines. The main goal of the program is to improve the production capacities of the Philippines. Now, based on the data from the completed part of the program, it is imperative to determine the impact of the investment on its beneficiaries and stakeholders. The impact assessment will be conducted to determine the achievement of the program's development objectives, assess the impact of the interventions on the beneficiaries at the micro, meso, and macro levels, and document lessons learned in the implementation of the program which crucial input in designing similar or related interventions in the future. The total cost for the implementation of this impact study is PhP 7,516,373.35 (PhP 4,999,879.15 is requested from DOST-PCAARRD, while PhP2,516,503.20 is the counterpart of the University of Southeastern Philippines as the implementing agency) to be implemented in 16 months across ten (10) study sites in the country.   | Publication: At least one (1) draft journal article; Patent - No patent/IP output for this project; Product - Information on the program's impact on stakeholders particularly assessed farmers, processors and other participants; People and Services - Ten (10) trained researchers; Places and Partnerships - Will cover the 10 implementation sites (Borjao, Panglima Sugala, Puerto Princesa, Tubbataha, Guian, Balabac, Quezon, Zamboanga, and Cagayan) for visits and potential collaboration to see the effect of localized context in the impact pathways; Policy - Identification of areas that requires further policy intervention, policy recommendations on sustainability (e.g. industrialization of the program introduced practices that are proven to be effective), policy recommendation to complement and support changes in outcomes caused by the program.   | University of Southeastern Philippines (USEP)  | 1. Policy and decision-makers, national R&amp;D system and R&amp;D funding agencies 2. Researchers and development workers 3. DOST-PCAARRD 4. Evaluators of R&amp;D programs 5. Academic 6. Seaweed networks across the country  | 01-Mar-23     | 31-Dec-24 | ONGOING | 4,999,793                       | 1,341,433.24       |                  |
| Impact Assessment of the National R&D Initiatives for Tilapia with Focus on the DOST-funded National Tilapia R&D Program        | Integrity of the environment and climate change adaptation and mitigation | Tilapia remained the second highest farmed food fish species in the Philippines in the last 25 years. Despite the industry's current position, the development of the tilapia industry was a series of growth, fall, and recovery in the last decade. Data also showed that this aquatic trend started with a significant drop in the average annual production growth rate from 21.8% in 2004-2007 to merely 2.44% in 2007-2010. To address this pressing concern, the DOST invested to boost tilapia production and enhance its product competitiveness through the National Tilapia Research and Development Program (NTRDP) from 2011-2015. Seven years after the completion of the projects under the NTRDP, this research generally aims to assess the impacts to key stakeholders and the society of the NTRDP using a mix of qualitative and quantitative data and analytical tools. By studying various impact pathways, the study intends to estimate the contribution of the NTRDP to key production parameters and industry targets and evaluate processes to inform future R&D programs to effectively support the development of the tilapia industry.   | Publication - a draft impact assessment bulletin and a draft journal article; Product: Information on the subsequent use of outputs and/or status of outcomes and impacts of the NTRDP through the identification of pathways/information on impacts of the NTRDP at the farm, community, and industry levels; People and Services: At least 4 faculty and/or researchers capacitated in impact assessment; Places and Partnerships: at least 3 partnerships/collaborations with LGUs, NGOs and/or LGU; Policies: a draft recommendation that can improve the design and implementation of future R&D and technology transfer programs for tilapia   | University of the Philippines Los Baños (UPLB) | Researchers; R&D funding and/or implementing agencies; Organizations; Fishery planners and managers; Policymakers; Tilapia industry stakeholders   | 01-May-23     | 31-Jan-25 | ONGOING | 4,999,893                       | 1,530,581.00       |                  |
| Impact Assessment of the Program on Refined Mangrove Crab Hatchery Technology   | Rapid, inclusive and sustained economic growth                            | The DOST-funded program on Refined Mangrove Crab Hatchery Technologies under the National Mangrove Crab Science and Technology Program aimed to develop techniques for sustainable production of marine arthropod crustaceans (mangrove crabs) through hatchery technology, promote mangrove crab hatchery and nursery technologies in selected sites, demonstrate the feasibility of a commercial mangrove crab hatchery, and sustainably produce mangrove crab through selective breeding. The program was conducted from 2012 to 2018 with a total budget amounting to PhP 28,403,176.7. This impact study aims to assess and quantify the social, economic, and environmental impacts of the said program in Philippines, particularly in the sites of implementation. This will provide valuable insights into the effectiveness of the refined mangrove crab hatchery techniques and their contribution to the aquaculture industry's growth and sustainability in the country.  | Publication: At least one (1) draft for a journal article; Product: Information about level of technology adoption and factors affecting technology adoption and the economic, social and environmental impacts of the mangrove crab hatchery technology; People and Services: At least two (2) researchers capacitated in impact assessment; Policy: At least one (1) policy recommendation for improvement of the design and implementation of future mangrove crab hatchery technology transfer of the program; Social Impact: Improved employment opportunities because of improved mangrove crab-based enterprises; Economic Impact: Increased income of mangrove crab hatchery operators, nursery farm operators, grow-out pond operators, and other participants in the mangrove crab industry; Increased competitiveness of the mangrove crab industry; and; Product: Information on the subsequent use of outputs and/or status of outcomes and impacts of the NTRDP through the identification of pathways/information on impacts of the NTRDP at the farm, community, and industry levels; People and Services: At least 4 faculty and/or researchers capacitated in impact assessment; Places and Partnerships: at least 3 partnerships/collaborations with LGUs, NGOs and/or LGU; Policies: a draft recommendation that can improve the design and implementation of future R&D and technology transfer programs for tilapia  | Mindanao State University (MSU- Naawan)        | — Mangrove Crab Hatchery Operators — Mangrove Crab Nursery Farm Operators — Mangrove Crab Grow-out Pond Operators — LGU supported FAs (possible shift from grown to mangrove crab production) — State Universities and Colleges (SUCs) — Research institutions — Private industries/SMEs                   | 01-May-24     | 31-Oct-25 | ONGOING | 4,992,064                       | 3,278,926.00       |                  |
| Impact Assessment of the Program on the Production of Corals for Reef Restoration   | Integrity of the environment and climate change adaptation and mitigation | The project will assess the impacts of the PCAARRD-funded program on production of Corals for Reef Restoration implemented from 2014-2017 with the general aim of improving reef restoration efforts through the development of culture technologies for sexual propagation of corals, identification of the impact of their expansion to natural habitats, and determination of the suitability for reef building, and the evaluation of the physiological responses and molecular mechanisms and the underlying response to various environmental stressors. The project at hand would employ various impact assessment methods to provide empirical data to effectively contextualize and quantify the impacts of the program. Furthermore, this study aims to provide an overview on the adoption rate and factors affecting adoption of such technologies in coral coastal communities and LGUs. Overall, the project aims to devise a monitoring and evaluation framework to support future coral reef restoration at least in the Philippines.  | Publication: At least 1 draft journal article for publication in ISI journals for impact assessment; Product: Information on the subsequent use of outputs and/or status of outcomes and impacts of the NTRDP through the identification of pathways/information on impacts of the NTRDP at the farm, community, and industry levels; People and Services: At least 4 faculty and/or researchers capacitated in impact assessment; Places and Partnerships: at least 3 partnerships/collaborations with LGUs, NGOs and/or LGU; Policies: a draft recommendation that can improve the design and implementation of future R&D and technology transfer programs for tilapia  | University of the Philippines Los Baños (UPLB) | Local fisherfolk; Local tourism; Local Government Units of Pangasinan, Cebu, and Taw-tawi Hills; DOST, DENR, and BFAR  | 01-May-23     | 31-Jan-25 | ONGOING | 4,999,997                       | 1,328,542.15       |                  |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---|---|--|--|---|---|---------------|-----------|---------|----------------------------------|--------------------|------------------|
| Improving Agricultural Productivity and Competitiveness of Women Livelihood Operators through Gender-Responsive S&T Strategies  | Integrity of the environment and climate change adaptation and mitigation | Women's role in agriculture is vital but not limited to household consumption, introduction of diversified diets to their households, and preparation of foods. They are also important in the process of marketing their products. They are doing products, they are doing products, they are doing products of crops from diversified agriculture and on the nutritional value of indigenous crops. Furthermore, they participate in post-harvest and processing. However, at present, there are several changes in the agri-food system that affect women's roles. There are gender gaps that need to be addressed, thus there is a need to promote gender-responsive S&T strategies which are useful in addressing the changes and issues that affect women. These strategies will help women improve their agricultural productivity and their competitiveness. In this regard, this project generally aims to document and enhance the specific roles of women livelihood operators in selected municipalities through gender-responsive S&T strategies. Through the use of SMC Analysis, Gender Analysis Tools such as the Harmonized Gender and Development Guidelines (HGDD) and Project Implementation and Management, and Monitoring and Evaluation (PMME) checklist, and engage the Women Empowerment Forefront, this project will be able to explore the participation and needs of women livelihood operators and this will help in making recommendations that will improve women's condition.  | Publication/One publication in a refereed journal/Product/GAD Information Bulletin on gender roles and issues of women livelihood operators/People and Services/Provide six (6) capacity building and training to twenty (20) women and men stakeholders and/or project participants. Each training will have fifteen (15) women and men participants/Places and Partnerships/From a link or establish a Memorandum of Understanding (MOU) with six (6) LGUs and with six (6) people's organizations, including women livelihood operators and women-led enterprises/Policy/Recommend policies that would help in the development of and improving women's access to more gender-responsive S&T strategies/enhance their productivity and competitiveness/Social Impact: The gender-responsive science and technology strategies can increase the gender gaps and eliminate the disparities between men and women livelihood operators/Economic Impact: Improved agricultural productivity and competitiveness will also increase the possibility of earning more relative to their previous condition.  | University of the Philippines Los Baños (UPLB)  | Women livelihood operators, Women-led Enterprises, Women and Men Researchers, Women and Men Policy Makers, Local Government Units   | 01-Oct-23     | 30-Sep-25 | ONGOING | 5,000,000                        | 1,139,534.00       |                  |
| Institutionalizing Integrated Crop Monitoring and Forecasting (ICMP) towards a Smarter Philippine Agriculture   | Integrity of the environment and climate change adaptation and mitigation | The main goal of this project is to facilitate the institutionalization of the SARAA ICMP system towards a smarter Philippine agriculture nationwide through policy advocacy and legislative processes. The project will take three paths to advance its advocacy: Executive, legislative, and university paths. It will employ a mix of local research methods. On top of the list of consultations with various Department of Agriculture (DA) units in charge of field operations (PhilRice, PCA, Planning Office, Field Operations Division) and data management system (DACT, DCT, NFA). Other key entities to be consulted on the establishment of the SARAA ICMP are the following: DOST-PAGASA, DOST-PhRISA, DILG and LGUs, private sector such as PHIMAZE, Inc. and Philippine Sugar Millers Association (PSMA), National Federation of GT Councils, among others. DOST Regional Offices is to be a major stakeholder in mainstreaming the system at the regional and local levels. The other level of consultation is with identified legislators at both the Congress and the Senate who can serve as champions of Philippine agriculture digitization program. The ultimate goal of the project is to draft and endorse policy instruments (e.g., Executive Order, Legislative Bill, Memorandum, Resolution) towards the institutionalization of the SARAA ICMP.   | Publications/One (1) advocacy plan developed/One (1) advocacy kit developed/One (1) paper/One (1) brochure about the policy reform and digital ICT materials/One (1) Publication/access stories from SARAA partner institutions and communities/One (1) video explainer on the SARAA ICMP development/People and Services/One (1) round table discussion and/or validation meeting with concerned NGOs, SOGAs, and farmer's federations/cooperatives stakeholders/One (1) legislative-executive forum on the institutionalization of SARAA ICMP conducted/One (1) meeting with the Technical Working Group conducted/Places and Partnerships/Policy Advisory Body (PAB) and Technical Working Group (TWG) established towards institutionalization of SARAA ICMP/Partnership forged with at least three (3) key government agencies in the conduct of advocacy initiatives/Policy instruments endorsed for the institutionalization of SARAA ICMP/One (1) draft Executive Order/One (1) draft Legislative Bill/One (1) draft Memorandum from UPLB/UP System on the creation of SARAA ICMP Center/Program Patents, Trademarks for SARAA and ICMP Social Impacts → Improved climate change resilience among well-being of farmers and their households → Decreased hunger incidence and food insecurity among Filipino communities/Economic Impacts → Improved farm productivity/increasing the total annual income of Filipino farmers → Positive growth in the economic performance of the Philippines/agriculture industry  | University of the Philippines Los Baños (UPLB)  | Farmers, farmer entrepreneurs, farmers/agribusiness cooperatives/LGUs where agriculture is an industry/Regional Agricultural Officers/Department of Agriculture (DA), Department of the Interior and Local Government (DILG)  | 01-Dec-23     | 30-Nov-25 | ONGOING | 5,000,000                        | 1,425,926.10       |                  |
| Integration of Indigenous Knowledge in Designing Nature-based Solutions for Climate-Smart Agriculture Sector in Selected Municipalities in Northern Philippines   | Integrity of the environment and climate change adaptation and mitigation | This action-oriented research project highlights the need to utilize a locally available knowledge resource, the indigenous knowledge of people for climate-smart agriculture practices. Primarily, it is that this is done through its integration to the design of nature-based solutions that directly respond to the climate hazards affecting the agriculture sector in the study areas. The study areas are: Nueva Vizcaya. In summary, the process that the research project will undertake will include understanding the socio-cultural, institutional, and biophysical context of the project sites, co-designing nature-based solutions with the local stakeholders in response to various climate hazards, and finally, assist the LGUs in institutionalizing these NBS as a vital component in establishing their respective climate smart agriculture sectors.   | Publications/Two (2) Journal articles/Research brief/Two (2) Policy briefs on the incorporation of indigenous knowledge in the design of nature-based solutions/Places and Partnerships/Related to DRR response/Coffee Table Book illustrating these practices/One (1) publication on the co-design and institutionalization process/Two (2) Capacity-building workshops with at least 15 stakeholder group representatives each/Places and Partnerships/Partnership with LGUs and NCP/Policy/Two (2) draft ordinances for the institutionalization of NBS in the local development plans/Social impacts: → Promotion and protection of IK-based natural resource conservation practices, especially within the context of local agriculture sectors → Strengthening of the partnership between the IP communities and the local government units → Higher recognition of the vital role of the IP community in the management of natural resources/Economic impacts: → Sustainability of the local agriculture sectors in the project sites   | University of the Philippines Los Baños (UPLB)  | The outputs of the study are targeted to primarily benefit the following:<br>Local government units<br>National Commission on Indigenous People<br>Department of Interior and Local Government<br>National Economic Development Authority<br>Department of Human Settlements and Urban Development<br>Department of Agriculture<br>Department of Environment and Natural Resources<br>Indigenous peoples of the Philippines | 16-Mar-24     | 15-Mar-26 | ONGOING | 5,000,000                        | 1,104,444.84       |                  |
| Island ReGen: Assessment of the Resilience of Small Island Communities and Gender Roles towards Alleviating Climate Change Impacts (Old Title: Island ReGen: Assessment of the Resilience of Small Island Communities and Gender Roles towards Mitigating Climate Change Impacts) | Integrity of the environment and climate change adaptation and mitigation | This project will determine the contemporary overall resilience of Busuanga and Marinduque, which are good representatives of the majority of small islands in the Philippines. Small islands have a high vulnerability to climate hazards that negatively impact ecosystems and human well-being. Since human interaction with the environment drives community responses to disturbances, the various components and connectivity in the natural and social systems of the islands must be understood. Resilience will be determined Resilience Assessment will be conducted through a community participatory workshop, survey, Focus Group Discussion (FGD), and Key Informant Interviews (KI) with women and men respondents. Twenty-two indicators from the Toolkit for Socio-ecological Productive Landscapes and Seascapes (SPELS) and other relevant studies will be adopted to identify the level of ecological, agricultural, and social resilience. Each indicator will be explained with discussion questions in the context of climate change and with local examples. Generated community landscape maps, documentation of biodiversity, sex-segregated baselining information, and radar maps on scores of resilience indicators will provide a better understanding of human-nature linkages toward island resilience. The trend for specific indicators will be the basis for recommendations to enhance the adaptive capacity to mitigate climate change impacts of selected small island communities. The project will contribute to the sustainable development planning of LGUs of Busuanga and Marinduque, and towards fulfilling our commitment to several national and international agreements and goals such as United Nations (UN) Sustainable Development Goals (SDGs), UN Women's Empowerment Framework, the National Economic and Development Authority's (NEDA) Philippine Development Plan (PDP) 2023 to 2028 and Ambisyon Natin 2040, and the National Academy of Science and Technology (NAST) PAGTANAW 2050. | Publications/At least two (2) conference paper/paper presentations/At least two (2) draft manuscripts for publications in refereed journals/Policy brief for the recommendations of the local government, Education and Public Awareness Materials on gender roles, biodiversity conservation and climate change action/Products/Training modules on gender sensitivity, resilience assessment and other climate-related topics/Places and Partnerships/Partnership obtained through a MOA or letter of support on the conduct of project activities such as capacity building with staff from the following institutions: Marinduque State College (MSC), Angler Park (Private), LGUs and communities in Busuanga and Marinduque islands. Specifically, collaborator with MGO to implement and monitor the progress of the project in Marinduque/People and Services/At least 50 number of stakeholders participated in the stakeholder consultation workshop on resilience and climate change/At least 50 number of stakeholders capacitated through a gender sensitivity training and discussion of gender issues in small island communities/Policy recommendations of increasing adaptive capacity, strengthening disaster risk management, and mainstreaming gender to climate change responsiveness/Social Impact: → Improved gender inclusion in biodiversity conservation and climate preparedness plans and actions → Improved capacity of the local community in monitoring the level of their resilience and in developing management and sustainable development plans → Enhanced resiliency of small island communities to environmental sustainability/Economic Impact: → Increased long-term economic gain from ecotourism and natural resource management activities as a result of recognizing the ecological importance of the areas for which the local community would be more conscious of the importance of habitat conservation while generating non-destructive livelihood sources.   | University of the Philippines Los Baños (UPLB)  | Target beneficiaries are the women and men of local communities and various stakeholders such as Local Government Unit, Non-government service institutions, policy makers, natural resource managers, and academe.   | 01-Feb-24     | 31-Jan-26 | ONGOING | 5,000,000                        | 1,242,615.92       |                  |
| Management Effectiveness and Impact of the Locally Managed Marine Protected Areas in Zamboanga Peninsula: Basis for Management Enhancement and Policy Recommendations   | Rapid, inclusive and sustained economic growth                            | Marine Protected Areas in the Philippines are primarily important in conserving the country's marine biodiversity. It is necessary to determine their status to identify interventions that could be recommended to enhance their effective management further. This proposal will empirically assess the management effectiveness and impact of the locally managed marine protected areas in the Zamboanga Peninsula enhancement and policy recommendations. This study will be conducted among the five locally managed MPAs in Zamboanga Peninsula. These MPAs were chosen from different provinces based on size, particularly those with the biggest area. The Management Effectiveness Tracking Tool (METT) will be utilized to evaluate the management effectiveness of the MPAs. Biophysical assessments will be conducted to assess the impact of the locally managed marine protected areas on the marine ecosystem. Likewise, surveys will be conducted to assess the level of awareness and support of the stakeholders. By assessing the management effectiveness of the MPAs being implemented by different Local Government Units, the study can develop a range of management effectiveness, where the highest performing LGU will serve as a benchmark in improving the management of other MPAs.  | Publications/One (1) policy brief/Three (3) publications in international journals/One (1) Environmental classes module/Two (2) Poster design/Two (2) Billboard designs/Products/Database of the five (5) locally managed MPAs provided to the Philippine Fisheries Protected Area Database/People and Services/Local partners and MPA implementers are trained on the standard methods of assessment of the MPA. Environmental classes are conducted to at least 100 male and female fisher folks that reside near the locally managed MPAs/Places and Partnerships/Partnerships between the five (5) LGUs managing and implementing the MPAs. DA, BFAR, DENR and Academe are created through an agreement/Policy/Code of policy recommendations for the management of MPAs/Social Impact: stakeholders and the communities surrounding the locally managed MPAs will develop greater awareness of the MPA, the marine ecology, and the coastal environment, which can significantly influence their acceptance of MPA. Having adequate knowledge about the marine ecosystem and its management processes is an important factor in understanding the importance of its conservation. Furthermore, being familiar with the features of the marine environment and sea resources may also develop greater concern over them. Thus the stakeholders may become more supportive of conservation efforts like the MPA. The community dependent on the area's marine resources will benefit from good marine water quality and increase fish catch as one of the major results after MPAs are effectively managed. Moreover, the MPA data, which will become accessible through the creation of a database, will benefit thousands of scholars, academicians, and government and non-government institutions who will be utilizing the information/Economic Impacts: There will be a significant improvement of the income and livelihood of the fisher folks around the areas where MPAs are established. Since effectively-managed MPAs are expected to increase their conservation value resulting from increasing fish catch | Misamis University (MU)   | → MPA Implementers → LGUs → Fisherfolks   | 01-May-24     | 30-Apr-26 | ONGOING | 5,000,000                        | 3,237,021.50       |                  |
| Productivity, Technical Efficiency, and Competitiveness of the Cacao Value Chain in Luzon and Visayas   | Rapid, inclusive and sustained economic growth                            | Cacao is gaining importance as a tradeable commodity in the world. The country has a big potential in cacao production and is an important source in the world. However, improvement in the country's competitiveness is important to create better market share. To achieve these, there is a need to analyze the economics of cacao as raw material to cacao-based food products. The project shall undertake value chain analysis, production and technical efficiency, and competitiveness analysis. As the study covers all aspects of cacao production and most special investments and pro-act's, the study will likewise highlight the critical aspects of the agri-business venture. A collective effort will be done among experts from related fields in technical, economic and social sciences to provide a holistic approach. Field survey and visual documentation and secondary data analysis will be done. Appropriate assessment tools will be done to attain the specific objectives and project deliverables. Research findings will be used to identify policy recommendations useful for decision making and proper planning to further improve the cacao industry. Various stakeholders can benefit from the results such as policy-makers, farmers, farmer-entrepreneur, farmers associations, private sectors, research, academe and other stakeholders to promote production, trade and even other R&D projects.   | Publications/One (1) draft manuscript for journal article/Product/G&S of information on technical efficiency, profitability, competitiveness, and value chain/People/Service/640 capacitated stakeholders/Places and Partnerships/Three (3) partnerships: CSU with DOST, DAR-FOs (M, V), PAOs (Aurora, Iloilo) and LGUs (to be identified)/Policy/Economic Impact: improved productivity, efficiency and competitiveness of cacao value chain/Social Impact: This project will be advantageous to farmers, cacao growers and processors, LGUs, and other stakeholders to increase cacao production through the information to be generated and draft recommendations to increase productivity, efficiency and competitiveness of cacao. The potential social impact of the project could be an increase in the number of cacao growers, cacao processors, distributors and other actors of the value chain. In addition, the economic impact could be improved cacao growers production efficiency, improved cacao competitiveness and share in the international market. Economic impact: The economic impact could be improved cacao growers production efficiency, improved cacao competitiveness and share in the international market. Economic impact: The economic impact could be improved cacao growers production efficiency, improved cacao competitiveness and share in the international market.  | Central Luzon State University (CLSU), University of the Philippines Los Baños (UPLB) | Cacao growers<br>Researchers and development workers<br>Students<br>Consumers<br>Market agents<br>Local government  | 01-Dec-24     | 31-May-26 | ONGOING | 5,000,000                        | 3,697,974.10       |                  |
| Salt Business Model Development for Small Island Economy  | Rapid, inclusive and sustained economic growth                            | Despite having a vast coastline and natural resource base, the Philippines' salt production has been declining, averaging only 1,084 metric tons from 2010 to 2019, with an annual decrease of 3.4%. Several factors contribute to this decline, including climate change, land conversion, low prices of imported salt and the existence of the Ash Law, which restricts salt marketing and distribution outside production areas. To address this situation, the government passed Republic Act No. 11985, aimed at strengthening and revitalizing the salt industry in the Philippines. Previous value chain analysis in the Negros and Mindanao regions have highlighted the profitability potential of salt production but also revealed challenges such as seasonality, low product quality, limited production areas, and the lack of a consistent supply of "base salt" for the cooking method. This project aims to demonstrate a viable salt community-based business model in Patnanungan Island, Quezon, where the existing fish-drying industry is currently hampered by the lack of locally produced salt.   | Publications/One (1) draft article regarding the salt industry/At least one (1) information bulletin regarding the current status and prospects of the salt industry in Luzon/Products/One (1) video documentation of the economic potential of salt production/One (1) database for salt farmers (includes among others production area harvested, market trends/prospects of value-added products) in Patnanungan Island/People/Service/Three (3) community-based salt business models developed with at least five people capacitated/Places and Partnerships/At least five (5) partnerships established on the farmer groups and local government units to be capacitated/Lead (2) market-based established/Policy/At least one (1) policy recommendation for the sustained improved production of salt in Patnanungan Island, possible upgrading in other areas that could lead to reduced salt importation/Social Impact: → Enhance relationships between the community through working together to meet the supply requirements → Engaged community to enter salt-related livelihoods → Improved situation of marginalized salt business/Economic Impact: → Increased access to salt as input requirement for the fish drying industry → Improved livelihood of the coastal community → Increased production of local salt  | University of the Philippines Los Baños (UPLB), Cavite State University (CSU)         | Salt farmer-cooperators, the residents of Patnanungan Island, fish drying industry of Patnanungan, the salt farmers in the major growing areas, and the salt industry of the nearby area and in the country in general.   | 01-Jul-24     | 31-Dec-25 | ONGOING | 5,000,000                        | 4,143,500.00       |                  |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---|--|---|---|--|--|---|-----------|-----------|----------------------------------|--------------------|------------------|
|   | Strengthening Science-Based and Policy-Informed Industry-Level Support to Boost the Viability of Bamboo-Based Enterprises in Laguna      | Rapid, inclusive and sustained economic growth                            | Through this project, the LGUs and the newly-created Laguna Bamboo Industry Development Council (LBIOC) and Laguna Bamboo Agricultural Cooperative (LBAC) will be supported to develop and implement strategic initiatives aimed at enhancing the scalability, market reach, technological sophistication, risk management, and overall sustainability of the value chain and enterprise solutions. The partnerships established from the earlier project will be leveraged to contribute resources, expertise, or market access to support the further development and adoption of interventions. A long-term strategic roadmap for provincial bamboo industry development will be developed outlining key milestones, objectives, and initiatives to guide future development and growth. At the enterprise level, more of the identified challenges in the production system, organization and management as well as linkages will be addressed. Continuing the enterprise development support to the enterprises would play a vital role in improving the industry and the capacity and operation of the enterprises to become more sustainable and profitable.<br><br>Lastly, the project will develop Council-based supply chain management systems adopting the AABH models on LGUs, SUCs and NGO-led supply chain management systems for the sustainability of the interventions and ensure a well-coordinated supply chain. This will be through the Provincial Agriculture Office which serves as the Secretariat of the Provincial Bamboo Industry Development Council.  | Publication <ul style="list-style-type: none"> <li>Issue at least two (2) news articles about the project</li> <li>One (1) promotional video to promote the bamboo industry of Laguna</li> <li>One (1) draft policy brief providing actionable policy recommendations for the sustainability of interventions</li> </ul> Patent/ Intellectual Property <ul style="list-style-type: none"> <li>One (1) copyright of IEC material</li> </ul> Product <ul style="list-style-type: none"> <li>Sex-disaggregated database of bamboo enterprises and other stakeholders</li> </ul> People Service <ul style="list-style-type: none"> <li>At least 40 men and women workers of bamboo processors and growers/ farmers trained according to the planned firm-based interventions</li> <li>At least 10 technical staff from the LGUs trained on technical and managerial aspects</li> </ul> Place and Partnership <ul style="list-style-type: none"> <li>Build partnerships with at least 15 industry players for the development of the Laguna</li> </ul>  | DOST-Forest Products Research and Development Institute (DOST-FPRDI) | <ul style="list-style-type: none"> <li>Women and men processors and producers of bamboo in Laguna</li> <li>Local Government Units (MAO, Provincial Agriculturist, etc)</li> <li>Other stakeholders of the Laguna Bamboo Industry Development Council</li> </ul>   | 01-Nov-24 | 30-Apr-26 | ONGOING                          | 5,000,000          | 3,013,220.00     |
|   | Valuation of Forest Ecosystem Services of Mt. Malindang Range Natural Park (MRRNP), Misamis Occidental                                   | Integrity of the environment and climate change adaptation and mitigation | With this, the project aims to conduct valuation of MRRNP ecosystem services using Contingent Valuation Method (CVM). The three important priority resources to be valued in this project are forest, water and tourism. This project is timely and urgent to determine how the biophysical resources and selected ecosystem services affect the socio-economic condition of the stakeholders. Their access and benefits derived from MRRNP will be determined. The Knowledge, Attitude, Practices of households towards the issues concerning the park will be assessed, using and positive value of the selective ecosystem services will be estimated, and factors affecting WTP for conservation will be identified. Ultimately, policy options for biodiversity conservation that focus on innovative financing mechanisms through Payment of Ecosystem Services (PES) and Access to Benefit Sharing (ABS) schemes will be formulated and recommended. After determining the Willingness to Pay (WTP) of selected households in the study area, analysis will eventually lead to an acceptable PES and ABS schemes which are feasible and applicable in Misamis Occidental. These will be the innovative financing mechanism for biodiversity conservation which will be used to generate funds and resources to support the continuous conservation of MRRNP. This will be supported by appropriate policies which will be enforced by the concerned agencies, LGUs, PAMB, DENR and other sectors directly involved in the park's conservation and protection. Ultimately, the enhanced conservation and protection effort involving all the stakeholders will positively affect ecological health and will be a vital step towards ensuring water sufficiency, food security and climate resiliency in the Misamis Occidental province.  | <ul style="list-style-type: none"> <li>Publication — One (1) story book— Two (2) modules (environmental classes and TOT) — 5 poster designs for information dissemination (CEPA)— 2 billboard designs for information dissemination (CEPA)— One (1) policy brief — 5 articles for journal publication 2. Product PES mechanism involving the four (4) major Water Districts in Misamis Occidental and adjacent Zamboanga Peninsula and integrating PES in their payments. — Ecosystem Accounts for MRRNP 3. People and Services At least 10 staff from the partners agencies provided with seminar/training on ecosystem accounts. 4. Place and Partnership Partnership established among Misamis University, MRRNP-PAMB, MRRNP-PAMB, local water districts and LGUs surrounding MRRNP. 5. Policy Policy recommendations for at least two (2) local policies/instruments/resolutions/Policy recommendations or inputs to the protected area management plan for MRRNP</li> </ul>   | Misamis University (MU)  | The primary beneficiaries of this project will be the local communities that will be informed of the total economic value of MRRNP through scientific methods. The most important beneficiaries include the MRRNP-PAMB and Local Government Units in Misamis Occidental who will use the data for the protected area management conservation and protection plans, programs, projects and activities. In likely manner, the project will enrich the academe's competency to improve their instruction, research and extension. The private sectors and NGO's can also utilize data for their respective priority environmental programs | 01-Jul-22 | 30-Sep-24 | COMPLETED                        | 5,000,000          | 720,778.41       |
|   | Value Chain Analysis for Selected Bamboo Products in the Philippines   | Integrity of the environment and climate change adaptation and mitigation | Bamboo is a fast-growing, renewable, and versatile resource, which is found in numerous communities in the Philippines. Bamboo development could contribute to at least seven of the UN Sustainable Development Goals, including poverty alleviation, affordable and clean energy, affordable and resilient housing, sustainable consumption, climate change mitigation, and terrestrial ecosystem protection (Gard et al., 2018). It also provides enormous opportunities for developing an inclusive, sustainable and green value chain. Bamboo plantations and natural stands exist all over the Philippines, both on government and private lands. Region 7 has the highest number of available culms yearly with 120,820 clumps, followed by Region 3 with 113,134 clumps. Major provincial sources of bamboo include Abra, Benguet, Ilocos provinces, La Union, Pangasinan, Ilocos, Batangas, Quezon and Camarines Sur in Luzon; Iloilo, Bohol, Negros provinces and Leyte in the Visayas; and Davao del Norte and Bukidnon in Mindanao (Vilvauro and Rowa, 2003). In terms of number of bamboo enterprises, Region 9 has the most number (590 enterprises) followed by Regions 10 and 11 with 303 and 305 enterprises, respectively. The Philippines is being pushed to become a key player in the global bamboo industry. The global bamboo market size was estimated at USD 13.28 billion in 2020 and is anticipated to expand at a compound annual growth rate (CAGR) of 5.7% from 2021 to 2028. Major driving factors include growing investments in infrastructure development, increasing use of sustainable building construction resources, and rising consumer awareness on the benefits of using bamboo. Bamboo has been declared as a cash-crop, as part of the efforts to develop the local bamboo industry. From 2021 to 2022, the government has allocated at least PHP 22 billion for the development of the bamboo industry in the country. Indeed, the growing global bamboo market and the initiatives of the government present opportunities to the bamboo industry players that they can take advantage of. | <ul style="list-style-type: none"> <li>Publication: Two (2) draft article for possible publication in a peer-reviewed journal (1 per Patent, MRRNP, Value chain map Matrix of VC players profiles and corresponding information/People and Services/Two (2) graduate students mentioned Two (2) technical personnel trained/Places and Partnerships: At least six (6) partnerships established comprising of the Department of Environment and Natural Resources- Forest Management Bureau (DENR-FMB), state universities and colleges (SUCs), and value chain players Policy: At least two (2) policy recommendations for the development of the bamboo industry</li> </ul>   | University of the Philippines Los Baños (UPLB)                       | The target beneficiaries of this project are the different value chain players, such as: farmers, traders, processors, and end-users who will benefit once the bamboo industry is invigorated. It also include government agencies involved in the development of the National Inventory System (i.e., DOST-PCAARRD and DENR-FMB)   | 01-Oct-22 | 31-Dec-24 | ONGOING                          | 5,000,000          | 1,111,659.60     |
|   | Value Chain Analysis of Bamboo Textile Products in the Philippines   | Integrity of the environment and climate change adaptation and mitigation | In this project, bamboo textiles will be analyzed through a value chain lens to uncover the bottlenecks of the industry and find opportunities for improvement in the chain. Furthermore, I would support the development of programs, projects and activities for the development use of bamboo fiber and textile in the Philippines.  | <ul style="list-style-type: none"> <li>Publication —At least one (1) draft article for possible publication in a peer-reviewed journal Product — Value chain map —Matrix of value chain players profiles and corresponding information/ People Services —At least one (1) undergraduate student mentioned —At least one (1) technical personnel trained Partnerships —At least six (6) partnerships established comprising of the Philippine Textile Research Institute, state universities and colleges (SUCs), and value chain players Policy —At least one (1) policy recommendation for the development of the bamboo textile industry/Economic Impacts: Through the information that will be produced from tracing the bamboo textile value chain, the project positions itself as a component of the strategy aimed at improving the competitiveness of the Philippine bamboo sector and improving the economic situation of smallholder bamboo farmers. Social Impacts: This project intends to empower stakeholders and players in the bamboo textile value chain in order to promote a more thriving bamboo industry in the Philippines. It would encourage the awareness of the market on bamboo textile which may attract individuals to enter on bamboo textile-related livelihood.</li> </ul>   | University of the Philippines Los Baños (UPLB)                       | The target beneficiaries of this project are the different bamboo textile value chain players, such as farmers, traders, processors, and end-users who will benefit once the bamboo industry is invigorated. It also includes government organizations working to build the National Inventory System and the bamboo textile industry such as DOST-PTRI, DOST-PCAARRD and DENR-FMB.   | 01-Oct-22 | 30-Sep-24 | COMPLETED                        | 2,000,000          | 221,778.00       |
|   | Value Chain Development of Tamarind in Central Luzon   | Integrity of the environment and climate change adaptation and mitigation | The project will build from the results of the two previous value chain studies funded by PCAARRD and DOST on tamarind to address the need for a supply chain management system and capacity building of the tamarind producers. Considering the economic importance of tamarind, this project will promote entrepreneurship from production and processing through strengthening the market linkage which will, in turn, induce job creation, economic activity, and socio-economic conditions of the target communities. By establishing a supply chain hub, a direct linkage between growers and processors will be conducted. This will yield guaranteed markets for growers'™ produce, encourage large-scale processing, and attract new entrants into the industry. Also, creating a direct link would diminish the dependence of growers to middlemen in terms of collection (i.e., collecting and receiving delayed payments) and marketing. This would enable the growers to secure higher prices by eliminating brokerage fees or commissions. Moreover, the removal of intermediaries in the chain will lower the delays and post-harvest losses incurred by the wholesalers and retailers.  | <ul style="list-style-type: none"> <li>Publication: At least two (2) articles based on the results of the project/Products/One (1) Supply Chain Hub/One (1) information system on tamarind/People and Services: At least fifty (50) men and women tamarind growers organized, trained and linked with the processors/Places and Partnerships/At least five (5) partnerships developed with LGUs, value chain actors (i.e., processors) and enabling players Policy: At least two (2) policy recommendations to address constraints identified</li> </ul>   | Pampanga State Agricultural University (PSAU)                        | Three (3) groups of beneficiaries are foreseen to benefit from this project. The following are: — Stakeholders of the tamarind industry, such as the growers, processors, and other entities providing support services along the value chain of tamarind in Central Luzon. — Policy/decision makers — Researchers and development workers involved in technology transfer and agribusiness development   | 01-Dec-22 | 31-Jul-25 | ONGOING                          | 5,000,000          | 981,101.23       |
| Bamboo Resources Inventory and Technology-Enabled Mapping in the Philippines (BRITEMAP) | Project 1. Community-based Inventory and Mapping of Bamboo Resources in the Philippines Aided by a Mobile Application (COM-APP BRITEMAP) | Rapid, inclusive and sustained economic growth                            | This project will take off from the outputs of the previous PCAARRD funded project Enhancing the Policy Initiatives on Bamboo, Developing a Harmonized System for Community-based Inventory of Bamboo Resources in Key Production Areas in the Philippines. Two primary important recommendations of the project are: 1) Scaling out of the bamboo inventory protocol, and 2) Development of a mobile app for the implementation of a nationwide bamboo inventory in the country. The proposed project is a convergence of efforts among government agencies such as the DOST-PCAARRD, UPLB, DTI-FBDC, and DENR-PCAARRD and DTI agreed to adopt the UPLB's™ recommendations and provide funds for the implementation of a nationwide bamboo inventory system and the development of the mobile app and dashboard (database system). It was also agreed that UPLB and DENR-ERDB will propose and implement separate projects but both projects are based on the same protocol. UPLB will perform the inventory for Regions 4B, 5, 8, 9, 12, and CARAGA while DENR-ERDB will perform Regions 4A, 7, 11, and CAR. However, very recently, the DENR-ERDB decided not to push through their proposal. Hence, PCAARRD requested UPLB to cover all the 11 regions. It is important to note that 3 other regions (R1, 6, & 10) were already covered by the previous PCAARRD-funded project BRITEMAP as the pilot site of the DTI-funded BRITEMAP project. This project aims to roll out the harmonized bamboo inventory protocol and capacitate bamboo stakeholders for the conduct of bamboo inventory including the use of the mobile application.  | <ul style="list-style-type: none"> <li>Products/Inventoried data/ database for the inventory/Publications: At least one (1) article submitted for publication in indexed journal/Improved/ finalized manual for the implementation of inventory protocol/Training manual/People Services/Identified stakeholders in conducting the actual inventory (At least 20 participants per region/Places and Partnerships/Partnerships with SUCs, DENR, DA, DTI, LGUs, PSA, GAA and Private Sector, Bamboo Farmers/ Traders, Manufacturers/Policy/Policy recommendations/ inputs to the proposed policy document, specifically the parameters and the aspects to be covered/Improved — Enabled to boost the bamboo industry through steady and reliable supply of bamboo poles &amp; products, growth of the bamboo manufacturing/processing sector — Contribute substantial revenues for farmers, manufacturers, and government agencies — Established bamboo enterprises for local and foreign markets/Social — Poverty alleviation among bamboo growers/farmers/bases — Strengthening of local partnership among bamboo stakeholders (government, PSA, community) — Inclusiveness and increased engagement of the community in the inventory and management of bamboo resources — Natural resource conservation and sustainable utilization of bamboo resources</li> </ul> | University of the Philippines Los Baños (UPLB)                       | — farmers and communities engaged in growing bamboo-based farming and livelihood. — potential investors in bamboo plantation development and bamboo-based enterprises — operators of enterprises and manufacturing plants using bamboo as raw materials — local government units with bamboo resources — National and regional government agencies such as DENR, DA, DTI, local government units (DENR, DA, DTI, LGUs), Philippine Bamboo Industry Development Council (PBIDC), PSA — Researchers and scientific community  | 01-Feb-24 | 31-Jan-27 | ONGOING                          | 10,729,260         | 3,286,063.40     |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---|---|---|--|--|--|--|-----------|-----------|----------------------------------|--------------------|------------------|
| Bamboo Resources Inventory and Technology-Enabled Mapping in the Philippines (BRITEMAP)   | Project 2. Mapping Bamboo Resources and Mobile Application and Dashboard Development in the Philippines (MAP-APP BRITEMAP)                  | Rapid, inclusive and sustained economic growth                            | Mapping resources plays a vital role in any decision-making platform, especially in providing information on the distribution, quantity, and other important features of a given asset. This capability of mapping has been demonstrated also in the recent project of UPLB-CIFN in plotting a community-based bamboo inventory system and implemented in three provinces. Coupled with the use of remote sensing and geospatial technology, the results of the project have gained utmost attention from various institutions. Currently, DTI has funded the development of a mobile application that will complement the inventory component including a dashboard that will help manage the data collected from the application. However, this has been piloted only in Cagayan province. For this particular project, it aims to further improve the mobile application that will entail use of base maps and other important layers for ease of reference and geolocations. Furthermore, the project also intends to develop a web application dashboard that can offer an intuitive platform for visualizing information and other relevant data about bamboo resources in the country. These could be in the form of maps, charts, graphs, tables, and other widgets.   | Products & A mobile app that people in the field can use to record and collect data & A web application dashboard that will facilitate management, retrieval, and visualization of bamboo resources in the 11 regions of the Philippines & A projected distribution map of bamboo resources in the 11 regions of the Philippines & Publications & At least one (2) articles submitted for publication in indexed journals & Video and/or user manual on how to use the web dashboard and the mobile application & Trained partners and local bamboo farmers in the use of the mobile app for bamboo inventory (at least 20 per region) & Trained partners on the use of web application dashboard (at least 20 per region) & Places and Partnerships & Partnerships with SCUs, DENR, DA, DTI, LGUs, PSA, GIs and Private Sector, Bamboo Farmers' Traders, Manufacturers & Policy & Policy recommendations in terms of the use or application of the mobile app and web dashboard & Social Impact: — Poverty alleviation among bamboo growers/farmers/traders — Strengthening of local partnerships among bamboo stakeholders (government, POs, community) — Inclusiveness and increased engagement of the community in the inventory and management of bamboo resources — Natural resource conservation and sustainable utilization of bamboo resources & Economic Impact: — Environment to boost the bamboo industry through steady and reliable supply of bamboo poles & products, growth of the bamboo manufacturing/processing sector — Contribute substantial revenues for farmers, manufacturers, and government agencies — Established bamboo enterprises for local and foreign markets | University of the Philippines Los Baños (UPLB) | a farmers and communities engaged in planting bamboo, potential investors in bamboo plantation development and bamboo-based enterprises, c. operators of manufacturing plants using bamboo as raw materials, d. national government for policy formulation and local government units with bamboo resources for utilization such as DENR, DA, DTI, local government units, and Philippine Bamboo Industry Development Council (PBIDC), PSA, e. Researchers and scientific community    | 01-Feb-24 | 31-Jan-27 | ONGOING                          | 7,127,963          | 2,491,109.20     |
| Bamboo Resources Inventory and Technology-Enabled Mapping in the Philippines (BRITEMAP)   | Project 3. Imperatives of Policy and Leveraging Stakeholders and National Entities towards Institutionalizing BRITEMAP (IMPLEMENT BRITEMAP) | Rapid, inclusive and sustained economic growth                            | The growth of the bamboo industry is hindered due to lack of reliable and updated bamboo information. Despite initiatives of the different agencies like DENR and DTI-PRBDC, bamboo information remained inaccessible, lacking and outdated. The BRITEMAP Program is proposing a technology system of an inventory system and information sharing scheme that will provide accurate, reliable and accessible bamboo resource information. In order for the technology to become sustainable and functional, it is proposed that an institution should be created that is mandated to adopt and implement the proposed bamboo inventory and information system. This will be done through the creation of a Technical Working Group consisting of representatives from the DENR, DA, DTI-PRBDC & DLG. Series of public consultations shall be conducted as a participatory approach in the formulation of the proposed policy.  | Publications & A at least one (1) article submitted for publication in indexed journals & 6-5 minivideo explainer & Policy & Policy recommendations in terms of the use or application of the mobile app and web dashboard & Social Impact: — Poverty alleviation among bamboo growers/farmers/traders — Strengthening of local partnerships among bamboo stakeholders (government, POs, community) & Inclusiveness and increased engagement of the community in the inventory and management of bamboo resources & Natural resource conservation and sustainable utilization of bamboo resources  | University of the Philippines Los Baños (UPLB) | a farmers and communities engaged in growing bamboo-based farming and livelihood, b. potential investors in bamboo plantation development and bamboo-based enterprises, c. operators of enterprises and manufacturing plants using bamboo as raw materials, d. local government units with bamboo resources, National and regional government agencies such as DENR, DA, DTI, and Philippine Bamboo Industry Development Council (PBIDC), PSA, e. Researchers and scientific community | 01-Feb-24 | 31-Jan-27 | ONGOING                          | 7,036,683          | 2,220,721.58     |
| Enhancing the Value Chain Project Designs for Coffee, Cacao and Cavendish Banana Towards the Development of Agri-Aqua Value Chain Laboratory in UP Mindanao | Project 1. Value Chain Analysis and Development: Cacao, Coffee and Cavendish Banana   | Integrity of the environment and climate change adaptation and mitigation | This project covers three of the five components of the program. It will update analysis of cacao, coffee and cavendish banana from previous projects as inputs to supply chain network design and agent-based modelling and app development for the other two program components. It will also conduct capacity building activities, evaluation and network development. For the three chains, updating includes utilizing previous survey data to examine the role of consolidation and clusters. Factors affecting the decision to cluster will be examined using a logit model. A technical efficiency model will also be estimated to analyze the role of clusters in enhancing efficiency. A new survey will be conducted for cacao which will be used in agent-based modelling in component 2 as well as in the analysis of clusters. Training and workshops on value chain analysis and development will be conducted for a selected group of researchers and practitioners. Stakeholder workshops will also be conducted to present research outputs. These capacity building activities and stakeholder engagement form part and parcel of developing a value chain laboratory for the agri-food sector.   | Publications — At least three (3) papers submitted for publication — At least two (2) papers presented in academic conference/forum Products — Blueprint of value chain upgrading strategies for the selected commodities — Training module on value chain analysis and development — Compilation of value chain studies in the Philippines Places and Partnerships — At least five (5) partnerships to be established with international research collaboration, partners with regional inclusive innovation center, industry, academic institutions, and local government unit(s) People — At least thirty (30) researchers, students and practitioners trained — At least three (3) thesis students involved Policies — Policy recommendations for the improvement of value chains of the selected commodities  | University of the Philippines Mindanao (UPMin) | small scale producers in selected agri-food chains (eg Tallie farmers association), researchers and practitioners in value chain research and development particularly those involving small scale producers and poor communities, government agencies and other relevant agencies.  | 01-Feb-23 | 31-Oct-24 | COMPLETED                        | 2,386,000          | 745,216.00       |
| Enhancing the Value Chain Project Designs for Coffee, Cacao and Cavendish Banana Towards the Development of Agri-Aqua Value Chain Laboratory in UP Mindanao | Project 2. Value Chain Modelling and Simulations: Cacao, Coffee, and Cavendish Banana   | Integrity of the environment and climate change adaptation and mitigation | This project aims to address the second component of the program on developing an agri-food value chain research laboratory in UP Mindanao. This project aims to develop models of agri-food value chains that will aid decision-making and evaluation of the chain. This project also seeks to support components 3 and 4 of the program, where value chain strategies and interventions will be disseminated to stakeholders. For phase 1, this project will focus on developing models of at most three chains: Cavendish banana, coffee, and cacao. Studying these value chains in UP Mindanao is not new. However, this project aims to incorporate the data gathered from previous studies (CHED-funded study on Cavendish banana value chain; DOST-PCIEERD-funded project on the coffee value chain; CHED-funded and PCARRD-UP Mindanao-funded projects for cacao value chain) to develop further models that will support the improvement of the studied chains. For the Cavendish banana, an updated model on the supply chain network design (SCND) will be improved based on the updated inputs gathered from component 1 of the program. For coffee and cacao, a prototype SCND model or an agent-based model will be developed based on the value chain analysis inputs from component 1. The results of the analysis of the SCND models for the value chains will provide insights on how to improve the income generation of small-scale enterprises and explore other alternative markets for the sustainability of the value chain. Similarly, results of the agent-based model aim to explore and reveal behavioral drivers affecting the actors of the chain. This model also looks at the interactions of key players in the value chain that drive potential scenarios of the chain's outputs. It is to be noted that the modeling techniques used in this project may also be adapted to other agri-food value chains that will be later explored in the succeeding phases of the program. | Publication — At least one paper for publication Products — At least three (3) value chain models of cavendish banana, cacao, and coffee Places and Partnerships — At least three (3) partnerships to be established with academic institutions, industry and local government unit(s) & Economic Impact — Improved livelihood of small-scale producers in selected agri-food chains through effective implementation of strategies and interventions — Improved economic status of the Davao region in the cacao, coffee, and banana sector — Increased financial benefits for value chain participants Social Impact — More inclusive and sustainable value chains in cacao, coffee, and banana — Improved technology adoption of small-scale producers in selected agri-food chains through a well-designed digital application to help decision-making at the farm level — Enhanced partnerships and stakeholder engagements to bring in investments for the large-scale deployment of digital technologies for selected agri-food chains.   | University of the Philippines Mindanao (UPMin) | small scale producers in selected agri-food chains (eg Tallie farmers association), researchers and practitioners in value chain research and development particularly those involving small scale producers and poor communities, government agencies and other relevant agencies.  | 01-Feb-23 | 31-Oct-24 | COMPLETED                        | 1,290,000          | 435,214.00       |
| Enhancing the Value Chain Project Designs for Coffee, Cacao and Cavendish Banana Towards the Development of Agri-Aqua Value Chain Laboratory in UP Mindanao | Project 3. Data analytics for the Cacao, Coffee, and Cavendish Banana Value Chains  | Integrity of the environment and climate change adaptation and mitigation | This project covers the data analytics component of the program. It will build on the updated analysis of the banana (Cavendish banana), cacao, and coffee value chains by developing decision support platform based on an analysis of issues in the value chains, previous outputs of mathematical models (e.g. SCND), previous technologies developed (e.g. Agri-Analytics), and data analytics. The technologies will be tested and built as a validated prototype. The prototype testing will include testing with small-scale farmers of the selected crops to validate model results and ease of use of the application. The capacity building activities will be based on the user manual of the application featuring how it provides insights for decision-making at the farm-level. Trainings and workshops will be conducted for its users. Technology pilot can be created to drum up investment support from potential investors. The stakeholder workshops will be a venue to present the capabilities of the prototype to gain interest and possible future investments from government or the private sector. The prototype(s) can also further be developed as a commercial technology through incubator programs. Project 3 will contribute to the large gap in AI.0 technologies in the three selected commodities.  | Products — Technology module on digital technology developed for cacao — Training manual on the use of digital technology based on decision support platform(s) developed Places and Partnerships — At least two (2) collaborative research partner from the regional inclusive innovation center, academe/government, non-government organization, and private sector People and Services — At least thirty (30) farmers and extension workers/technicians (public and private) trained for technology use — At least three (3) thesis students involved — At least twenty (20) key industry players informed about the technology outputs from the forum conducted — Stakeholder forum conducted involving 30-40 participants where technology outputs are presented as results to agriculture 4.0 technology development policy and incubator programs of the academe and government & Social Impact — Improved technology adoption of small-scale producers in selected agri-food chains through a well-designed digital application to help decision-making at the farm level.  | University of the Philippines Mindanao (UPMin) | The target beneficiaries of the project include small scale producers in selected agri-food chains (eg Tallie farmers association), researchers and practitioners in value chain research and development particularly those involving small scale producers and poor communities, government agencies and other relevant agencies.  | 01-Feb-23 | 31-Oct-24 | COMPLETED                        | 1,324,000          | 462,493.00       |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---|--|---|--|--|--|--|-----------|-----------|----------------------------------|--------------------|------------------|
| Resource Inventory, Valuation and Policy in Ecosystem Services under Threat (RE-INVEST): The Case of the West Philippine Sea                                    | Project 1. Resource Inventory and Assessment of the West Philippine Sea  | Integrity of the environment and climate change adaptation and mitigation | Project 1 of the RE-INVEST Program seeks to quantify the ecosystem assets and services in the WPS and assess the biophysical impacts of damages in the area. Specifically, the project aims to make a comprehensive determination of its biological resources, ascertain the mineral and energy resource potential of the area, measure the spatial extent of damage that has occurred in the last decade due to anthropogenic activities, and elucidate other potential damages due to construction, navigation, and marine pollution.  | Publication a. Ten (10) manuscripts for submission to reputable scientific journals b. At least one (1) policy brief c. At least two (2) explainer videos. Press releases and collaterals for promotional activities d. Database of locations, extent and condition of coastal and marine biodiversity and resources of seven (7) project sites. Assessment of marine biogeography protocols. Communication plan for the RE-INVEST WPS Program e. Six (6) Master/PhD students who will be part of the project as GREAT scholars. RS-GIS, modelling, molecular analysis and/or fieldwork techniques for use in coastal and marine scientific research, whichever is relevant to their component. Place Linkage with project site LGUs Policy Science-based inputs into policy for coastal and marine environmental resource valuation   | University of the Philippines Diliman (UPD)    | Filipino people (in terms of food and job security), LGUs and NGAs, Fisheries researchers  | 01-Apr-22 | 31-Mar-25 | ONGOING                          | 79,427,230         | 38,814,441.92    |
| Resource Inventory, Valuation and Policy in Ecosystem Services under Threat (RE-INVEST): The Case of the West Philippine Sea                                    | Project 2. Natural Capital Accounting of Coastal and Marine Ecosystems in the West Philippine Sea  | Integrity of the environment and climate change adaptation and mitigation | Project 2 of the RE-INVEST Program will develop a systematic and comprehensive accounting and valuation of the ecosystem assets and services of the WPS that conform to international guidelines and frameworks. Using natural capital accounting, estimation of the coastal and marine assets and services will be made by putting values to different components, and its contribution to the economy and human well-being will be analyzed.   | Publication: At least three complete drafts ready for submission to journals/At least one (1) policy brief At least two (2) explainer videos Product: Coastal and marine natural capital accounts for WPS Standardized valuation protocol People: Capacity building of stakeholders and project staff Educating the local and NGAs on the value of coastal and marine resources of WPS Two (2) graduate students involved in the project as GREAT scholars Place: Linkages with LGU, academe, NGAs that are mandated to protect/manage coastal resources Policy Input to possible national law/policy on WPS   | University of the Philippines Los Baños (UPLB) | Fisherfolks within the WPS National policy makers, "no local and NGAs Graduate students, SUCs  | 01-Apr-22 | 31-Mar-25 | ONGOING                          | 22,416,795         | 7,258,941.37     |
| Resource Inventory, Valuation and Policy in Ecosystem Services under Threat (RE-INVEST): The Case of the West Philippine Sea                                    | Project 3. Development of Legal and Policy Framework for the Assessment, Valuation, and Accounting of Philippine Coastal and Marine Resources          | Integrity of the environment and climate change adaptation and mitigation | Project Component 3 of the RE-INVEST Program will enhance the general legal and policy framework for marine resource valuation, accounting, and assessment in the Philippines, including the means for determination of liabilities and apportionment of damages and/or penalties for adverse impacts on the marine environment and resources attributable to man-made causes, both deliberate or accidental. The current framework is too specialized and limited in scope and application, and there is a need to expand and elevate its status and utility, hence the necessity for the RE-INVEST Program. Component 3 aims to provide the legal basis for more specific initiatives for assessing damages for the degradation of the marine environment and resources, particularly in the West Philippine Sea (WPS). It will also provide legal guidance/advise as necessary to the other two Project Components in the course of the RE-INVEST Program to ensure that recommendations work within the parameters of relevant Philippine laws and policies.   | Publication: Two (2) research papers/publications, the first, reviewing the Philippines' existing legal and policy regime relevant to marine resource valuation, accounting, and assessment; and the second, comparing the Philippine legal and policy regime with international practices and experiences, proposing general legal or policy reforms to improve/enhance the Philippine legal and policy regime. One (1) research paper/publication utilizing the findings of the previous research and applying the guidelines to the situation in the West Philippine Sea, assessing legal liabilities and possible damages for damage to the marine environment and resources therein, relying on the findings of Project Components 1 and 2. Paper Product: One (1) guidelines for making, pursuing and proving claims for damages and/or imposing penalties and costs for marine environment/resource indemnity, rehabilitation or restoration before national and international courts or tribunals. People: One (1) public seminar/symposium on the liability and compensation regime for the marine environment and resources. Place: Partnership with the International Oil Pollution Compensation Funds (IOPC) Policy: One (1) draft legislative bill and/or draft interim policy instrument providing guidance for the investigation, documentation, and assessment of damages and costs for the marine environment and resources   | University of the Philippines Diliman (UPD)    | Government officials and agencies involved in environment and natural resources management Civil society stakeholders with interests in environment and natural resources  | 01-Apr-22 | 31-Mar-25 | ONGOING                          | 5,792,155          | 1,650,334.84     |
| Socio-Ecological Assessment of the Invertebrate Clearing Fisheries in the Philippines Towards Evidence-Based Sustainable Resource Governance (GleanPhi Program) | Project 1: Gleaning Fisheries as a Valuable Food System: Socio-demographics, Fisheries Production, Food Security, and Nutrition of Coastal Communities | Rapid, inclusive and sustained economic growth                            | Gleaning fisheries, characterized by the collection of seafood resources from intertidal areas, play a crucial role in the food security of coastal communities dependent on subsistence fishing. Gleaning, however, is given less priority in the Philippine government's research, development, and management programs. Appropriate attention to this sector and the provision of science-based evidence to support a policy framework are urgently needed to prevent overharvesting of nearshore seafood resources. There is also a need to highlight the adoption of a community-based participatory research approach as well as gender roles and their contribution to small-scale fisheries production. The main goal of the project is to obtain reliable, comprehensive, and sex-aggregated information on the social and economic values of gleaning fisheries to support formulation of management measures toward sustainable utilization of macroinvertebrate resources in the Philippines. The project's main focus is on the socio-demographic profile of gleaners, the production and marketing of gleaning products, and their contribution to food security and nutrient adequacy of the gleaning households. The project results will provide valuable input to formulating policy recommendations toward the sustainability of the gleaning fisheries and their myriad benefits to marginalized coastal communities in the country. | Publication—2 journal publications in national or international indexed journals—1 program manual on gleaning fisheries research methods—1 field guide/protocol on the most commonly gleaned invertebrates in the Philippines—7 policy briefs/notes—2 undergraduate/graduate thesis manuscripts/abstracts. Product—1 set of demographic, socio-cultural, and economic profile data to be shared to other researchers and partners. People—Services—At least 300 gleaner respondents engaged and capacitated (increased awareness and participation in managing gleaning fisheries)—7 trained local field enumerators for fisheries catch monitoring—2 undergraduate/graduate students conducted their thesis under the project—4 collaborating SUCs trained on demographic, socio-cultural, and economic surveys, fisheries catch monitoring, and household nutrition survey—5 LGU/governance officials trained towards gleaning fisheries governance—6 meetings with LGUs with regards to project updates—1 multi-stakeholder validation workshop involving LGU representatives, DABAR representatives, program members, 4 staff from DOST-PCAARRD-SEDR, and 3 national experts on gleaning fisheries/Policies and Partnerships—6 Memorandum of Agreement with collaborating agencies or member institutions of Food Bag To Be Ignored (TBITV)-Philippines—7 coastal barangays trained on gleaning fisheries survey and monitoring methods, and informed on resource use impacts—7 Partnership with DABAR (National and Regional Offices) and DENR through MOA/MOU/Letter of support—1 Partnership with Palawan Council for Sustainable Development (PCSD) and other similar bodies as needed through MOA/MOU/Letter of support/Policy recommendations on management measures for sustainable gleaning fisheries governance for at least 6 local fisheries ordinances—input to formulation of a national policy on gleaning fisheries management (e.g., Fisheries Administrative Order/ Social Inequal—Heightened awareness by women and men gleaners on the importance of coastal marine resources and the need to sustain gleaning fisheries through management policy—Sustainable livelihoods among women and men gleaners—Food security and nutritional benefits for marginalized households, reducing their reliance on other more expensive sources of protein—Traditional or cultural practices across different localities can be preserved which in turn could have an impact on the conservation of gleaned resources—Capacitated women and men gleaners in managing intertidal macroinvertebrate resources in their locality which support gleaning fisheries—Sustainable gleaning practices may attract funding for marine research and conservation efforts, benefiting the coastal ecosystem as well as the communities—Increased environmental awareness, empowerment, and participation of coastal communities at large in invertebrate fisheries management. Economic Impact—Livelihood opportunities among women and men gleaners | Mindanao State University Naawan (MSU-Naawan)  | Results of this project shall benefit the following stakeholders: Local government units and their staff at the MAO, MEND, and MPDO Members of the local Sangguniang Bayan in crafting fishery ordinances Gleaning community (both full-time and part-time gleaners) Fisherfolk Organizations (including Women's Associations) Municipal Fisheries and Aquatic Resource Management Councils (MFARMCs) University faculty and graduate students NGOs and other civil society groups | 01-Oct-24 | 31-Mar-26 | ONGOING                          | 6,561,945          | 2,422,272.05     |
| Socio-Ecological Assessment of the Invertebrate Clearing Fisheries in the Philippines Towards Evidence-Based Sustainable Resource Governance (GleanPhi Program) | Project 2: Gleaning Habitat and Biodiversity Assessment and Biology of Commercially Exploited Marine Invertebrates                                     | Rapid, inclusive and sustained economic growth                            | Despite the importance of gleaning fisheries as a source of food and supplemental income, the ecological and biological dynamics of seafood resources remain inadequately studied. The proposed project focuses on studying the ecology, biology and aspects of the population dynamics of commercially important species collected by gleaning in selected sites of the Philippines. A description of the gleaning habitats, diversity of macroinvertebrates therein, and relevant ecological information of the various sites will be provided in the project through employing fisheries-independent survey techniques. General information on the biology of the identified target species from each site will be explored, including information on species' ground condition and some aspects of their population dynamics. Investigations on ecology and biology are crucial to help us better appreciate these resources and understand their dynamics to ultimately help in crafting rational management guidelines for the sustainable utilization. Utilization of these species for food and income shall be covered by the gleaning fisheries component of this research program. Altogether, this information provides input to the crafting of management guidelines for the sound utilization of these commercially important gleaned resources in the country.   | Product—Inventory of commercially important gleaned invertebrate species—Two (2) more scientific papers for publication in peer-reviewed journals—Two (2) technical report highlighting important results from the project—One (1) policy brief highlighting recommended measures on invertebrate gleaning or harvesting—At least one (1) brochure or pamphlet, e.g. Inventory of commercially important gleaned invertebrate species and techniques in determining maturity of selected species—Two (2) papers on project results presented in scientific meetings (e.g., PAMS 2025, ICFAS/People Services—One (1) graduate student with research experience—Two (2) trained local field enumerators—Six (6) LGUs provided with scientific information/ Technical advice/Policies and Partnerships—Six (6) Collaborations with five (5) SUCs in Luzon, Visayas, and Mindanao through a Letter of Cooperation or Memorandum of Agreement—Linkage with invertebrate stakeholders, particularly capacitating seven (7) barangays on gleaning in resource management. LGU/Policy—Science-based information as inputs for local and national management policies—Biological information potentially be used in effectively managing gleaned resources—Potential for expanded networking with key stakeholders in the gleaning industry—Increased attention by local and government and community stakeholders to conservation of invertebrate resources and habitat protection. Recognition of the vital role of women in gleaning fisheries and household food security. Empowerment of the gleaners toward community-based gleaning fisheries management. Economic Development of aquaculture potential or food processing value of gleaned resources—Development of viable livelihood for women and other gender groups in sustainable gleaning fisheries—Viable income for men and women from gleaning activities to supplement revenues from gear-based fisheries. Increased women's access to government-supported livelihood programs   | University of the Philippines Visayas (UPV)    | Invertebrate/mollusk gleaners and other stakeholders (vendors, processors, traders)—National government agencies and BFAR regional offices—LGU staff and policy makers (SB) of each site—Academic institutions—Graduate students   | 01-Oct-24 | 31-Mar-26 | ONGOING                          | 2,080,321          | 1,490,589.20     |
| Socio-Ecological Assessment of the Invertebrate Clearing Fisheries in the Philippines Towards Evidence-Based Sustainable Resource Governance (GleanPhi Program) | Project 3: Value Chain and Governance Assessment of Gleaning Fisheries in the Philippines  | Rapid, inclusive and sustained economic growth                            | This research project proposes for a value chain analysis of gleaning with focus on common gleaned species, and at the same time assess the governance of gleaning fisheries in selected sites on the basis of the results in identifying interventions to improve outcomes through regulations and programs. The will contribute to the general picture of gleaning in the country. Data will be collected using mixed-methods and will be analyzed using descriptive statistics.   | Product—Three (3) value chain maps/infographs—One (1) policy matrix of laws, ordinances and resolutions related to gleaning fisheries—Publications—One (1) policy brief on the state of gleaning fisheries in the country and the market participants identify specific areas for improvement, as well as where they can collaborate to collectively increase value addition in gleaning products. The local governments in the area concerned can use the information from the results in identifying interventions to improve outcomes through regulations and programs. The will contribute to the general picture of gleaning in the country. Data will be collected using mixed-methods and will be analyzed using descriptive statistics.  | University of the Philippines Visayas (UPV)    | Gleaners, traders, processors; policy makers, researchers, fisheries managers  | 01-Oct-24 | 31-Mar-26 | ONGOING                          | 3,357,734          | 2,573,681.10     |





| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---------------|--|---|---|--|--|--|-----------|-----------|----------------------------------|--------------------|------------------|
|               | Developing Technology Transfer Capacity of the Philippine Science High School System (PSHSS)   | Integrity of the environment and climate change adaptation and mitigation | The PSHSS is the premier science high school of the Philippines where students are prepared for a career in science, technology, and mathematics (STEM). In line with this, students are trained to develop high aptitude in science and mathematics. The PSHSS is conducting STEM-based research, which outputs are expected to benefit the general society. As a result, the PSHSS Systems produced numerous technologies in the last five years that are eligible for commercialization and public use. To further encourage students to embark in meaningful research endeavors, the PSHSS-OED aims to create a framework that will guide every campus in the system to implement technology transfer on their own. This students' worry and qualified research outputs can be commercialized for public use.   | Publication: 17 IECs (Technology Briefs) one-page under the TCM Patent: 33 IP applications (UM & Patent only under the IPAC) Product: 1 IP and technologies inventory (IPAC) technologies with technology solution reports (under the IPAC) People: 33 staff trained in national IPAC<br>31 staff trained in national TCM/Place: 1 commitment letter for the national training. Policy: Drafting enhancement of the PSHSS Technology Transfer Framework  | Philippine Science High School System (PSHSS)  | The training will upskill PSHS STEM and research teachers and staff on technology transfer and, when translated to classroom instruction, they would be able to properly guide PSHS students in conducting STEM research that is aligned to the standards of intellectual property rights and commercialization. Moreover, the public use of commercialized PSHS projects will be an opportunity for the PSHS to be of service to farmers, fisher folks, small to medium enterprises, and the Filipino households, among others. | 01-Jun-23 | 31-May-25 | ONGOING                          | 4,104,032          | 924,758.00       |
|               | Empowering Fisherfolks through the S&T Community Based for Inclusive Development (STC4D) Modality in Barangay Beha, Magallanes, Sorsogon   | Rapid, inclusive and sustained economic growth                            | The Harmonized National Research and Development Agenda (HNRA) 2022-2028 prioritized research programs and projects for the years through the Department of Science and Technology (DOST). This agenda primarily aims to eradicate inequality, create more opportunities, and accelerate development. By this mandate, the science and technology (S&T) project and research from several agencies were called for the agenda. Thus, the proposed project of Sorsogon State University (SorsU) promotes social empowerment, technology adoption, and enterprising development in the poorest communities in Magallanes, Sorsogon. This project is a fisheries program aligned with SorsU-RIE Agenda such as: 1) RET-IA; Modernized Food Production and Security; 2) RET-IA2, Sustainable Agri-Fisheries and Natural Resources; 3) RET-IG Gender, Ethnic Equity and Empowerment and 4) RET-AT Socio-Cultural, Political, Economic and Tourism Development. The university RIDE agenda was a product of a series of consultations and forums that started in 2020-2027 and focused on the communities with marginalized populations, geographically and socio-economically disadvantaged social groups in the ANWR sector. The SorsU fisheries program offers to serve the poor and priority coastal communities to establish sustainable and resilient ANWR-based S&T community livelihoods such as fishery product development, innovation, advanced technology in aquaculture, socio-enterprise increase competitiveness, and investment in human capital development.   | EXPECTED OUTPUTS (OPs)<br><br>YEAR 1<br><br>YEAR 2<br><br>Products<br><br>1 Community Needs Assessment Report verified<br>19,200 packs Tlanggit produced (10%)<br>1,754 gal bottles of fish sauce produced<br>5,568 bottles fish paste produced<br>438 kilograms Fish Meal<br>1 Business Plan developed  | Sorsogon State University (SorsU)  | The project beneficiaries are women and men, farmers/fisherfolk in Bryg Beha, Magallanes, Sorsogon. The said beneficiaries are active members of the organized cooperative of Bryg Beha, Magallanes, Sorsogon known to San Rafael Baguio Consumers Cooperative (SRBCC). It has 30 active members in the organization who are actively engaging in the production of fish drying and selling frozen chicken.  | 16-Sep-24 | 15-Sep-26 | ONGOING                          | 5,000,000          | 2,508,784.00     |
|               | Empowering S&T-Based Bamboo Enterprises Through Bamboo@Ecosystem Across Select Regions in the Philippines - Phase 2  | Rapid, inclusive and sustained economic growth                            | This project builds upon the accomplishments of Bamboo@Ecosystem Phase 1, which successfully introduced bamboo farming communities in Iloilo, Bulaknon, and Iigan to the Bamboo@Ecosystem innovative mobile marketplace designed for sustainable, eco-friendly, and S&T-based bamboo products (The Bamboo@Ecosystem) and a USTP-developed and supported technology, can play a pivotal role in attaining the objectives of market linkage for small bamboo farmers and enterprises. This app can significantly expand the reach of small bamboo farmers and enterprises by providing a digital platform to showcase their products. This means that farmers who previously had limited access to local markets can now connect with a broader customer base, including regional and even international buyers. This expanded market access can lead to increased sales and revenue for small-scale bamboo producers. During this phase, the project focuses on empowering local communities through various capacity trainings and essential skills in value addition, online transactions, pricing strategies, and user experience testing. Additionally, strategic collaborations with government agencies like DTI, DICT/DEAR, DOST regional offices, private sector, bamboo industry development council, bamboo MSMEs, and farming communities in Iloilo, Bulaknon, and Iigan were established, creating a robust network vital for sustainable growth. However, Phase 1 also identified crucial gaps that need to be considered moving into Phase 2. Among these gaps is the necessity to extend training programs to farmers who were not part of the initial phase, ensuring that the knowledge and benefits of the technology are widespread and inclusive. Additionally, the promotion of Bamboo@Ecosystem as a vital gap, highlighting the necessity for comprehensive marketing strategies to maximize the app's reach and impact. Looking ahead to Phase 2, the project envisions a comprehensive approach. The focus will be on bridging these identified gaps: 1. Intensifying training efforts to reach previously uninvolved bamboo farmers in other regions; 2. Pre-commercialization activities like promotion and development of marketing strategies; and 3. Recognizing the need for a comprehensive digital ecosystem. This project includes the development of a dedicated Bamboo@Ecosystem website and an iOS application design. The website will serve as a hub for information, product listings, and a seamless user experience, catering to a wide range of users, including potential buyers and bamboo entrepreneurs. Simultaneously, the iOS application will enhance accessibility, catering to the growing user base of Apple device owners. By providing these additional platforms, the project aims to maximize reach and inclusivity, ensuring that bamboo producers and consumers can engage effortlessly with the Bamboo@Ecosystem. Finally, this proposed project aims to support the nation's commitment to sustainable economic growth and also positions bamboo as a vital catalyst for both economic and environmental conservation strategies. | Publication:<br>A Year 1<br>Year 2<br>Total<br><br>Publications<br>1 assessment report prepared<br>1 business plan prepared<br>A<br>1 assessment report prepared<br>1 business plan prepared<br><br>Patent:<br>A Year 1<br>Year 2<br>Total<br>A<br>1 website iOS application<br>2 trademarks filed   | University of Science and Technology of Southern Philippines - Cagayan de Oro (USTP-Cdo) | Bamboo farming communities, Bamboo MSMEs and LGUs  | 01-Jul-24 | 30-Jun-26 | ONGOING                          | 4,998,680          | 2,684,340.00     |
|               | Enhancement of goat food value chain systems towards agricultural productivity and food sufficiency in Region 2 - Phase 2  | Rapid, inclusive and sustained economic growth                            | The proposed project will continue the efforts made during the pandemic in addressing food value chain for slaughter goat and to evaluate the emerging dairy goat production in the region. The proposed project will provide solution to the gaps or problems encountered during the implementation of DOST-PCAARRD Smart Food Value Chain Phase 1. One of the notable accomplishments of the Phase 1 project is the establishment of the important segments in the food value chain from production, processing to marketing. However, several gaps are identified, which are all relevant to make the chain sustainable. Among the identified gaps that need to be addressed include continuous upgrading of stocks to the former project beneficiaries and introduction of other goat-related enterprises to support the effort of the raisers to increase their farm holding capacity. New communities will also be tapped for the conduct of the same activities with the aim to increase the herd size. On dairy goat production, evaluation of the current management practices must be done to develop packages of technology interventions to make the enterprise sustainable and profitable. Aside from improving the production of raw materials, the processing of products is proposed to be diversified for cheese, while for dairy, food hygiene and sanitation will be imparted among processors to ensure that the milk products are safe for human consumption. Lastly, market will be enlarged to make the enterprises profitable. Overall, the project will help develop goat as sustainable livestock enterprise that will help address the agricultural productivity and food sufficiency in Region 2.   | Publication: 1 module on dairy goat production<br>1 module on milk production<br>2 materials (video and print) for project promotion<br>2 papers published in scientific journal<br>Patent: 4 copyrights filed<br>Product: Increase in goat population (at least 30% of the present population in study sites)<br>Increase in dairy goat production by 10%<br>People: 4 key government agencies coordinated<br>6 LGUs coordinated and identified as new sites<br>6 project partnership agreement signed<br>150 goat raisers trained on slaughter goat production<br>6 slaughter goat trainings conducted<br>3 cooperatives/associations trained on dairy goat production<br>3 dairy goat production trainings conducted<br>3 trainings on milk processing conducted<br>3 farmer organization registered<br>4 raisers enrolled to DOST-PCAARRD-ISU ATBI Program<br>2 scientific for acromvention attended<br>Place: 1 calibration agreement with key agencies<br>5 partnership agreements with LGUs<br>Policy: 1 developed policy inputs in support of the food value chain operations        | Isabela State University (ISU)   | Slaughter goat raisers<br>Dairy goat association and cooperatives<br>Industries (agriculture-based and food industries)<br>Local government units  | 01-Jan-24 | 31-Dec-25 | ONGOING                          | 3,184,704          | 1,842,352.00     |
|               | Enhancing Climate Resilience through Native Tree and Fruit Tree-based Agroforestry Technology: A Science and Technology-Based Initiative for Emergencies and Hazards in Datu Blah Sinsuat, Maguindanao | Integrity of the environment and climate change adaptation and mitigation | The most recent Severe Tropical Cyclone (STC) Thera in November of 2022 has caused havoc and disasters in some areas of the province especially in Bryg Kusung, Datu Odn Sinsuat Municipality with over 655 million dollars to houses, agriculture, livestock and infrastructure in Bryg Kusung alone. Nearby the disaster areas is the municipality of Datu Blah Sinsuat, Maguindanao, which has a similar topography and soil characteristics of Sita Teabon, Bryg Kusung, Datu Odn Sinsuat, Maguindanao. Without appropriate interventions, the risk of similar disaster occurring in this municipality remains imminent. The mountainous and sloping topography in many areas of Datu Blah Sinsuat Municipality is barren, filled only with grasses that sometimes serve as fodder for livestock. These areas receive minimal efforts from the LGU and from the region to improve vegetation. Such as occasional tree planting activities. Hence, this project is being proposed to provide S&T intervention that could improve the vegetation and community resiliency against the impacts of climate change like intense rainfall that might bring landslides and flooding like what happened in the nearby Bryg Kusung. This is by establishing native and fruit tree-based agroforestry farm in the community especially to the areas that are barren and sloping. The native and fruit tree seedlings will be raised in the MSU-Maguindanao Agroforestry Nursery and in the temporary nursery in the selected sites of DOST-Anbsp; Simultaneous with the seedling preparation in the seminar on promoting agroforestry technologies, crafting of individual land-owners agroforestry plan and training on seedling production and other nursery techniques to increase ecosystem and community resiliency against the impacts of climate change. Anbsp;  | Publication: One (1) video documentation for the project<br>One (1) documentation report<br>One (1) research article sent to research journal<br>Patent: 1 copyright registration of one (1) site assessment<br>People: 20,000 native tree seedling production<br>30,000 fruit tree seedling production<br>1 campus nursery enhanced<br>3 temporary nurseries established<br>35 hectares of established/rehabilitated sites using native and fruit tree-based agroforestry<br>100 individual landowners<br>A of agroforestry plan<br>People: 225 people attended the seminar on promoting agroforestry technology as a strategy for ecosystem resilience.<br>50 people trained on planning for agroforestry plantation establishment<br>100 people trained on nursery propagation and production of native fruit tree and fruit tree seedlings<br>Place: At least 2 institutional collaborations established/strengthened with MOA<br>At least 10 Memorandum of Understanding established with project beneficiaries<br>Policy: 1 policy draft (Sustainability of the agroforestry projects) | Mindanao State University - Maguindanao (MSU-Maguindanao)                                | Formers of Datu Blah Sinsuat Maguindanao Local Government Unit/Indigenous People (IPs), indigent senior citizens, PWDs, and solo parents<br>A of beneficiaries<br>Local entrepreneurs  | 16-Oct-24 | 15-Apr-27 | ONGOING                          | 5,000,000          | 2,662,232.00     |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---------------|---|---|--|---|--|---|-----------|-----------|----------------------------------|--------------------|------------------|
|               | Enhancing the Coffee Food Value Chain through Smart Technologies and Partnerships towards Food Resiliency in Region IV A&B (CALABARZON & MIMAROPA) – Phase II       | Integrity of the environment and climate change adaptation and mitigation | The Cavite State University - National Coffee Research, Development and Extension Center (CVSU-NCRDEC) proposes the second phase of the DOST-PCAARRD-Enabled Coffee Food Value Chain Project to monitor the support services provided to its beneficiaries in CALABARZON during its 1st phase. Further assessments and continued implementation of transferred technologies will be made to efficiently measure its maximum impact on the lives of the men and women in the region's coffee sector. More programs and interventions which were not employed before due to budget, time, and COVID-19-related constraints will also be done here. Included in the primary targets of the project for the second phase are to further increase the coffee production area in CALABARZON; to continuously apply the rejuvenation technology to improve the quality of the PO's coffee products by increasing the adoption rate of suitable and need-based processing technologies; to strengthen and widen the region's local coffee processing by assisting POs in product development; to capacitate the project beneficiaries through organizational upgrading and conduct of various capacity building activities; and to increase the coffee profitability by improving the market and institutional linkages in CALABARZON. In phases II and III, the project will also scale out the best practices identified during the first phase of the project to the selected POs in MIMAROPA. These undertakings are envisaged to capacitate and empower regions IV A&B's key coffee value chain players in all aspects of coffee production and processing, marketing, and organizational management. The first phase of the Coffee Food Value Chain (CFVC) project was implemented by CVSU for 22 months. The project generally aimed to enhance the status of CALABARZON's coffee sector, especially during the pandemic. Serving as its beneficiaries were the ten identified coffee producer organizations (POs) and the two pilot farms from CALABARZON. These POs were subjected to a series of needs assessments, survey interviews, AI, and Focus Group Discussion (FGD). Through these, some of the critical problems at the coffee production, processing and marketing levels were found. To address the identified gaps, the team conducted various capacity building activities in all nodes of the chain. The 131 and 3 STCIBF components were specifically established to effectively achieve the project's defined goals. Here, activities such as the provision of extension training at the production and processing level, recommendation of two potential MS for coffee, introduction of value-adding activities and various Food Safety and Environmental Conservation are a few of the concerns of consumers in buying fresh fruits and vegetables. The vegetables our farmers produce must be PHISAP certified not only does it support food safety and environmental management but also ensures the quality of the produce while protecting the workers. The project aims to create a community-based production and marketing scheme that will eventually result in the year-round production of various vegetables. The proposed scheme also aims that there will be very minimal surplus, such surplus results in the fluctuating prices of vegetables in the market. The project is expected to deliver a sustainable vegetable system that can support the food security of the municipality of Magallanes, Cavite. The farmers of Magallanes, Cavite aim for the municipality to become the vegetable basket of Cavite and the PHISAP hub of CALABARZON. This sustainable system is expected to be replicated and adopted in other municipalities aiming for more sustainable and safe vegetable farming systems. | <ul style="list-style-type: none"> <li>1 needs assessment report prepared for the selected POs in MIMAROPA</li> <li>At least 4 IEC materials produced about the project and technologies applied</li> <li>1 training brochure developed incorporating all NCRDEC's modules on coffee production and processing</li> <li>At least 2 promotional videos developed</li> <li>1 social media page maintained</li> <li>1 strategy plan developed prior to the full-blown implementation of the project</li> <li>2 benchmarking activity reports for the 2-year project duration</li> <li>2 site assessment reports/development plans for the pilot farms drafted</li> <li>2 business plans prepared in phase 1 updated</li> <li>1 sustainability plan prepared at the end of the project</li> <li>Patent</li> <li>At least 6 copyrights filed for the whole duration of the project</li> <li>Product: <ul style="list-style-type: none"> <li>At least 1 POT and SMART technology (rejuvenation) used at the farm level</li> <li>At least 1 POT and SMART (wet processing/other suitable processing method) used</li> <li>At least 10% adoption rate (per POs) for the whole duration of the project</li> <li>At least 15 has of new coffee plantation established</li> <li>At least 1 coffee nursery established for the whole duration of the project</li> <li>At least 2 new coffee products developed</li> <li>At least 1,000 pcs of innovative packaging materials transferred to the selected POs</li> <li>2 manual/mechanical assisters, 2 cutters, and 1 coffee nester deployed (technology transfer)</li> </ul> </li> <li>At least 600 copies of IEC materials distributed</li> <li>1 packaging material developed for each 2 POs who will be assisted in introducing their single origin coffee</li> <li>People: <ul style="list-style-type: none"> <li>At least 12 farm enterprises supported for the whole duration of the project</li> <li>At least 6 food processors supported and mentored</li> <li>At least 2 POs assisted in the development of their start-up/new coffee products</li> <li>3 benchmarking activities on the well-established coffee cooperatives in the country</li> <li>3 incubators in phases 1, and at least 3 new incubators enrolled and supported for phase 2</li> <li>At least 3 associations applied for CDA accreditation</li> <li>At least 1 additional MS for coffee recommendation</li> </ul> </li> </ul>  | Cavite State University (CVSU)   | <p>The following POs from the CALABARZON region will be the beneficiaries of the project:</p> <ul style="list-style-type: none"> <li>Balen Coffee Growers Association (BCGA).</li> <li>General Emilio Aguinaldo, Cavite</li> <li>Minatok East Coffee Growers Association (MECGA), Amadeo, Cavite</li> <li>Casita Guinting Upland Marketing Cooperative (CGUMC), Cabuyao, Laguna</li> <li>Juan Santiago Agriculture Cooperative (JSAC), Sta. Maria, Laguna</li> <li>Cueva Coffee Farmers Association (CCFA), Sta. Maria, Laguna</li> <li>Agri Farmers Multi-Purpose Cooperative (AGFAMCO), Nasugbu, Batangas</li> <li>Kayaway Farmers Association (KFA), Nasugbu, Batangas</li> <li>Samahang ng Magasa ng San Andres Babak Cuyambay Association, Tanay, Rizal</li> <li>Adarna Coffee Cooperative, Candelaria, Quezon</li> <li>Formerly Masalakot Farmers Association</li> <li>Guinayangan Coffee Growers Association and Farmer Entrepreneur (G-CAFF) Inc., Guinayangan, Quezon</li> </ul> <p>Owners of 2 pilot farms will also be the beneficiaries of the project.</p>                                       | 01-Jul-23 | 30-Jun-25 | ONGOING                          | 5,000,000          | 965,892.00       |
|               | Establishment of Sustainable PhilGAP Vegetable-based Farming Systems in Magallanes, Cavite (PhilGAP Magallanes)   | Rapid, inclusive and sustained economic growth                            | The proposed project is an expansion of one of the completed CALABARZON Kontra COVID-19 projects implemented by Bulacan Agricultural State College from April 2021 to March 2022. Through this project, safer and healthier foods will be made available through the revitalization of the EatBabayKubô concept practicing a farming system free from using synthetic fertilizers and chemical pesticides. Through the participatory conduct of the different project components such as the establishment of a seedling nursery, capacity enhancement activities, disposal of farm inputs, and provision of technical and agri-entrepreneurial assistance, women farmer-beneficiaries will be enabled to establish their own SIsangP-based integrated backyard garden that will serve as a source of safer food and additional income for their farm families. The project will enable the target beneficiaries to have an additional income of around Php 32,586.00 from vegetable production plus around Php 8,848.00 to Php 117,593.00 from free-range chicken (FRC) production for their farm family through the proceeds of the sales of their excess produce. In addition, the identified women's association per project site can also earn around Php 16,542.00 from the established nursery for producing a total of 300 seedling trays (60 per production cycle) catering not only to the seedling needs of the women farmer-beneficiaries but also to the seedling demands of the community. Adoption of agricultural food production safety practices, environmental conservation, women empowerment, and revitalization of the EatBabayKubô spirit among the women beneficiaries are also expected to be cultivated while nurturing their agri-entrepreneurial mindset through implementing this proposed project.   | <ul style="list-style-type: none"> <li>At least 10 (ten) area covered/planted with</li> <li>12548 1/2 products/Produced 60 trays of seedling/Produced vegetables per municipality: 7,340 total kgs of assorted vegetables (eggplant, tomatoes, finger pepper, hot pepper, okra, luffa, squash, sweet corn, and cucumber); 51,600 bundles of assorted leafy vegetables (pechay, ulamang kangkong and sweet potato talabunan); 7,800 pcs of pole sta/Produced FRC products per municipality - Option A: 34,560 pcs eggs; 6,280 FRC chicks; 11,897.30 kgs of FRC meat- Option C: 12,560 heads of seven-day-old FRC chicks; 23,794.60 kgs of FRC meat/People and Services/Verified 17NA to 60 beneficiaries/Conducted 12 trainings (4 each per project site (GAD &amp; organization management, vegetable production, FRC production, recordkeeping &amp; financial management)/Trained 60 trainees (20 women per site)/Established 3 seedling nurseries (1 each per municipality)/Conducted 1 Labayng-Isa/Conducted 3 farm/IEC's field day/Places and Partnerships/Signed 3 MOAs with LGUs/Signed 3 MOAs with women's association/Publication/Developed 1 nursery operation manual/EA 2/Products/Produced 300 trays of seedling/Produced vegetables per municipality: 12,840 total kgs of assorted vegetables (eggplant, tomatoes, finger pepper, hot pepper, okra, luffa, squash, sweet corn, and cucumber); 66,800 bundles of assorted leafy vegetables (pechay, ulamang kangkong and sweet potato talabunan); 13,600 pcs of pole sta/Produced FRC products per municipality - Option A: 34,560 pcs eggs - Option B: 17,280 pcs eggs - 6,280 heads of FRC chicks; 11,897.30 kgs of FRC meat - Option C: 12,560 heads of seven-day-old FRC chicks; 23,794.60 kgs of FRC meat/People and Services/Conducted 3 trainings (1 each per project site on agri/entrepreneurship)/Trained 60 trainees on agri/entrepreneurship (20 women x 3 trainings)/Conducted 3 harvest festivals/Publication/Developed 4 IEC materials (1 flyer each on organic vegetable production, farm waste management, vermicomposting, and FRC production management)/Developed 1 training module/Developed and produced 1 video documentation of the project/Prepared 1 article for submission in a scientific journal/Item/Copyrighted 4 IEC materials (1 flyer each on organic vegetable production, farm waste management, vermicomposting, and FRC production management)/Copyrighted 1 training module/Copyrighted 1 Nursery operation manual/Policies/Drafted 1 policy recommendation to respective LGUs on the adoption of S&amp;T based integrated</li> </ul>    | Department of Agriculture - Regional Field Office CALABARZON (DA-CALABARZON) | <p>Magallanes Vegetable Farmers/Agricultural Extension Workers/Other Stakeholders (market-buyers)</p>   | 01-Jun-24 | 31-May-26 | ONGOING                          | 5,000,000          | 3,592,376.00     |
|               | Expanding Women-led Integrated Backyard Farming in Bulacan through the S&T Community-Based Farm (S&T-CBF) Modality  | Rapid, inclusive and sustained economic growth                            | The proposed project is an expansion of one of the completed CALABARZON Kontra COVID-19 projects implemented by Bulacan Agricultural State College from April 2021 to March 2022. Through this project, safer and healthier foods will be made available through the revitalization of the EatBabayKubô concept practicing a farming system free from using synthetic fertilizers and chemical pesticides. Through the participatory conduct of the different project components such as the establishment of a seedling nursery, capacity enhancement activities, disposal of farm inputs, and provision of technical and agri-entrepreneurial assistance, women farmer-beneficiaries will be enabled to establish their own SIsangP-based integrated backyard garden that will serve as a source of safer food and additional income for their farm families. The project will enable the target beneficiaries to have an additional income of around Php 32,586.00 from vegetable production plus around Php 8,848.00 to Php 117,593.00 from free-range chicken (FRC) production for their farm family through the proceeds of the sales of their excess produce. In addition, the identified women's association per project site can also earn around Php 16,542.00 from the established nursery for producing a total of 300 seedling trays (60 per production cycle) catering not only to the seedling needs of the women farmer-beneficiaries but also to the seedling demands of the community. Adoption of agricultural food production safety practices, environmental conservation, women empowerment, and revitalization of the EatBabayKubô spirit among the women beneficiaries are also expected to be cultivated while nurturing their agri-entrepreneurial mindset through implementing this proposed project.   | <ul style="list-style-type: none"> <li>Established 10 (ten) area covered/planted with</li> <li>12548 1/2 products/Produced 60 trays of seedling/Produced vegetables per municipality: 7,340 total kgs of assorted vegetables (eggplant, tomatoes, finger pepper, hot pepper, okra, luffa, squash, sweet corn, and cucumber); 51,600 bundles of assorted leafy vegetables (pechay, ulamang kangkong and sweet potato talabunan); 7,800 pcs of pole sta/Produced FRC products per municipality - Option A: 34,560 pcs eggs; 6,280 FRC chicks; 11,897.30 kgs of FRC meat- Option C: 12,560 heads of seven-day-old FRC chicks; 23,794.60 kgs of FRC meat/People and Services/Verified 17NA to 60 beneficiaries/Conducted 12 trainings (4 each per project site (GAD &amp; organization management, vegetable production, FRC production, recordkeeping &amp; financial management)/Trained 60 trainees (20 women per site)/Established 3 seedling nurseries (1 each per municipality)/Conducted 1 Labayng-Isa/Conducted 3 farm/IEC's field day/Places and Partnerships/Signed 3 MOAs with LGUs/Signed 3 MOAs with women's association/Publication/Developed 1 nursery operation manual/EA 2/Products/Produced 300 trays of seedling/Produced vegetables per municipality: 12,840 total kgs of assorted vegetables (eggplant, tomatoes, finger pepper, hot pepper, okra, luffa, squash, sweet corn, and cucumber); 66,800 bundles of assorted leafy vegetables (pechay, ulamang kangkong and sweet potato talabunan); 13,600 pcs of pole sta/Produced FRC products per municipality - Option A: 34,560 pcs eggs - Option B: 17,280 pcs eggs - 6,280 heads of FRC chicks; 11,897.30 kgs of FRC meat - Option C: 12,560 heads of seven-day-old FRC chicks; 23,794.60 kgs of FRC meat/People and Services/Conducted 3 trainings (1 each per project site on agri/entrepreneurship)/Trained 60 trainees on agri/entrepreneurship (20 women x 3 trainings)/Conducted 3 harvest festivals/Publication/Developed 4 IEC materials (1 flyer each on organic vegetable production, farm waste management, vermicomposting, and FRC production management)/Developed 1 training module/Developed and produced 1 video documentation of the project/Prepared 1 article for submission in a scientific journal/Item/Copyrighted 4 IEC materials (1 flyer each on organic vegetable production, farm waste management, vermicomposting, and FRC production management)/Copyrighted 1 training module/Copyrighted 1 Nursery operation manual/Policies/Drafted 1 policy recommendation to respective LGUs on the adoption of S&amp;T based integrated</li> </ul> | Bulacan Agricultural State College (BASC)                                    | <p>Target beneficiaries are 60 women farmers (housewives, marginalized women, or any women family members directly engaged in farming) of underprivileged, urban, and rural backyard farm families who are willing to adopt the technology. The target of the project is to encourage every member of the family to plant and grow chemical pesticide-free vegetables, raise naturally grown free-range chickens, and sustain the EatBabayKubô system in their backyard. However, instead of the traditional system of listing the head of the family (usually the father) as the farmer-cooperator, this project will give a chance to the marginalized women and women farmers to shine and oversee the project as a way of empowering them through the provision of access to technology to be extended to them. The project aims not to put an additional burden on the duties and responsibilities of the women's family members, but to enable them to practice their decision-making power, enhance knowledge on S&amp;T based agricultural production, and improve leadership capability as well.</p> | 01-Jun-24 | 31-May-26 | ONGOING                          | 5,000,000          | 3,632,784.00     |
|               | Leveling-Up of Innovative Agriculture, Aquatic and Natural Resources-based Startups/Spinoffs thru Promotion, Validation Assistance, and Development (LUPAD) Phase 2 | Rapid, inclusive and sustained economic growth                            | In 2022, the DOST-PCAARRD and UP ISSI collaborated to design and implement a developmental project aimed at commercializing AANR-based technologies through startup enterprises. This project is a response to RA 11293 or the Philippine Innovation Act and RA 11537 or the Innovative Start-up Act which both underline the importance of knowledge as a vital component for rational development and sustainable economic growth. Such technologies were the result of extensive research and development by State Universities and Colleges (SUCs) nationwide. Specifically, the project Leveling-Up of Innovative Agriculture, Aquatic, and Natural Resources-based Startups/Spinoffs through Promotion and Assistance and Development (LUPAD) aimed to strengthen the agricultural start-up's competency in marketing, operations, human resources, and finance at an accelerated pace in a manner attuned to the start-up's industry-specific needs. LUPAD capacitates and assists the entrepreneur in preparing a business plan (which includes specific plans for Marketing, Operations, Organization, and Financial), projecting financial statements including the computation of return-on-investments (ROI), diagnose and troubleshoot operational challenges to enable him/her to leverage opportunities. Furthermore, the project helps the enterprise develop a combination of short-term and long-term action plans for business continuity and growth. Key features of the project also include assistance in purchasing and checking the appropriate equipment and effective facility renovation to support scale-up objectives.  | <ul style="list-style-type: none"> <li>Publications/6 - At least 25 IEC materials (brochures/IEC - At least 25 promotional online articles (posted on ISSI channels)/6 - 8 Quarterly Mentorship Reports (covering 25 enterprises/6 - 2 Proceeding for the Inception Meeting/6 - 1 LUPAD Promotional video/1 Coffee Table Book of Batch 1 SGT with 7 beneficiaries/Products - At least 25 AANR-based products supported and promoted/People and Services - At least 25 entrepreneurs successfully assisted in proposal packaging, evaluated, and enrolled in the project/At least 50 trained and mentored entrepreneurs (CEO or founder and 1 manager) - At least 8 entrepreneurs mentored from the new PCAARRD ATIS-SUC site - At least 25 Business Plans updated - 2 inception meetings conducted/25 enterprises provided with a certificate of compliance from the project's TAs accompanying entrepreneurs - (At least 8) trained professionals in the valuation certification program/At least 4 Certified Valuators/25 enterprises supported in their planning and conduct of localized business matching activities/6 enterprises mentored and monitored (Batch 2 LUPAD/Places and Partnerships-3 partnerships with business associations and relevant advocacy groups/Local Impact-Increase awareness of technological advancements within the individual sector-Promote inclusiveness through the participation and memberships of women and the marginalized sector/Economic Impact-Generation of employment through the promotion of startups/Spinoffs, Promotion of sustainable enterprises in various sectors through competitiveness and innovation.</li> </ul>  | University of the Philippines-Institute for Small-Scale Industries (UP-ISSI) | <p>Twenty-five (25) AANR-based startups and spinoffs and at least eight (8) professionals for valuation certification training.</p>   | 01-Nov-24 | 31-Oct-26 | ONGOING                          | 8,822,413          | 5,037,916.60     |
|               |   |   | The LUPAD Phase 2 differs from the pilot phase as it incorporates another feature to further support the growth of AANR-based technology start-ups. After the project's intervention, the enterprises will require additional resources such as capital to continuously pursue innovation and scale-up operations as they increase marketability. In the shift to a knowledge-based economy, patents owned by LUPAD beneficiaries become vital assets that could unlock substantial value during business or startup valuation. Startup valuations are gaining traction in entrepreneurial finance with developments in the startup enabler ecosystem, such as the concentration of universities, research centers, and  | <ul style="list-style-type: none"> <li>Promote personal and professional well-being through increased wealth generation and job opportunities.</li> </ul>   |  |   |           |           |                                  |                    |                  |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---------------|--|--|--|---|--|--|-----------|-----------|----------------------------------|--------------------|------------------|
|               | Nature-based Solutions for Sustainable Mangrove Management and Resilient Coastal Communities Through Innovative Green Engineering Approach                         | Rapid, inclusive and sustained economic growth | Mangrove conservation and restoration play a pivotal role in mitigating coastal risks, especially in the vulnerable province of Ilocos Norte, where annual climate change impacts and powerful storms take a toll. Properly rehabilitating and sustainably managing these mangrove resources can yield a multitude of environmental, social, and economic advantages, essential for the resilience of coastal communities and the broader ecosystem. Revitalized mangroves serve as a formidable barrier, safeguarding lives, properties, and critical infrastructure like fishing ports and agricultural lands. They shield coastal areas from the escalating threats of storm surges, erosion, and saltwater intrusion driven by rising sea levels and extreme weather events. Mangroves act as potent carbon sinks, absorbing significant amounts of carbon dioxide. Expanding mangrove cover aligns with climate change mitigation efforts, helping combat global warming and reducing the region's carbon footprint, vital for international climate commitments and sustainable development goals. Also, mangroves harbor rich biodiversity, providing a haven for various endangered and endemic flora and fauna. Rehabilitation efforts contribute to biodiversity conservation, bolstering ecological equilibrium and supporting broader marine and terrestrial ecosystems. The project empowers local communities, farmers, and fisherfolk through active engagement, training, and participation in mangrove conservation. This instills a sense of ownership and pride, enhancing their resilience to climate change and enabling informed decisions about natural resources. Economically, the project fosters sustainable livelihoods linked to mangrove conservation and restoration. Income-generating activities such as ecotourism, crab farming, and sustainable fishing practices reduce dependence on climate-vulnerable livelihoods, improving local well-being and long-term economic stability. The promotion of bamboo for green engineering also boosts bamboo farming and associated livelihoods. In essence, the comprehensive approach not only bolsters resilience against coastal hazards but also contributes to climate change mitigation, biodiversity conservation, community empowerment, and sustainable economic growth—a model for holistic and sustainable coastal management. | Publication: 1. Project brochure<br>2. Paper: Site suitability analysis in mangrove plantation in Ilocos Norte<br>3. Manual in coastal mangrove management with green engineering technology<br>4. Paper: A green engineering approach to assist mangrove establishment using bamboo fence<br>5. Paper: Estimates of blue carbon opportunities with a facilitated establishment of new mangrove areas in Ilocos Norte<br>Patent: 1. Copyright of project brochures<br>2. Copyright of manual on mangrove planting with assisted self-engineering approach<br>Product: Vulnerability maps of coastal communities and mangrove areas<br>People: 1. Project staff trained for drone flying and image processing<br>2. Project staff trained in advanced GIS<br>3. 1 project staff trained in advanced GIS<br>4. 2 project staff trained for project monitoring and evaluation<br>5. Members of the community trained in mangrove propagation with organized cooperative<br>Place: 1. Established local partnerships (2 LGUs, 1 NGO, 2 SUCs)<br>2. Conducted cross visits in 2 communities with similar project<br>3. establish at least 2 international collaborations<br>Policy: 1. Policy brief for coastal wetland management policy and recommendation | Mariano Marcos State University (MMSU)         | This project is expected to serve primarily the coastal municipalities that are vulnerable to coastal hazards that could be aggravated by climate change. Since the province of Ilocos Norte is a coastal province, all coastal municipalities may adapt the output of the project to increase their resilience against the worsening occurrence of hazards. | 01-May-24 | 30-Apr-26 | ONGOING                          | 4,969,936          | 2,720,468.00     |
|               | Pre-Commercialization of FertiGroa® N, P and K Nanofertilizers   | Rapid, inclusive and sustained economic growth | The project will be implemented for 24 months (October 01, 2022 - September 30, 2024) by the University of the Philippines Los Baños - College of Agriculture and Food Science, University of the Philippines Los Baños - College of Agriculture and Food Science, Institute of Crop Science, College of Agriculture and Food Science with a total PCAARRD-GIA funding of Php 29,717,725.16. Nanofertilizers increase crop productivity by enhancing nutrient uptake by the plant. Although at its nascent stage, the application of nanotechnology in agriculture, offers the potential to make agriculture more efficient, can increase yield and product quality and thus increase nutritional benefits (Yuekkumar et al. 2011, Banotra, 2017). The nanoparticles provide an efficient means to distribute fertilizers and even pesticides in a controlled fashion with high site specificity and hence could provide a sustained supply of the needed nutrients to the growing crops with a reduction in the rate of applied fertilizers. Reduction in environmental damage could also be attained thus making agriculture more environment-friendly.  | Publication: Two (2) published research articles in refereed journals<br>Patent: At least one (1) patent for the scale-up production of FertiGroa® Product.<br>Three (3) FertiGroa® Nanofertilizers<br>People: Two (2) students<br>Place: All Trade Marketing and Manufacturing (ATMM)<br>TAO/CEM Dragon Distribution Inc. Policy: (None)   | University of the Philippines Los Baños (UPLB) | Sugarcane growers and farmers, farmer's, „,„s association, local government units, agricultural extension workers, students, and spin-off companies who will manufacture FertiGroa® N, P and K nanofertilizers.  | 01-Mar-23 | 28-Feb-25 | ONGOING                          | 18,629,651         | 9,139,825.52     |
|               | Rehabilitation of Critically Degraded Areas and Bamboo Stand Establishment using Microbial Technology For a Smart Green Gold Economic and Environmental Resiliency | Rapid, inclusive and sustained economic growth | This proposal will complement the ongoing NRCIP-funded program titled Greening-Mixed Out Areas Program (GMAP) in the Philippines with 1 completed project in Marinduque (2016-2020), 1 extended project in Surigao del Norte (2019-2023) and 3 newly-funded project in Cebu, Marinduque and Zambales. To date, around 12 ha mined-out areas in Mogog, Marinduque and Surigao del Norte was transformed into a young productive mixed-forest using the UPLB commercial biofertilizers. In June 2023, some forest seedlings and bamboo species propagated in the nursery owned by Marinduque State College (MSC) were inoculated with microbial fertilizers located in Brgy. Calapang, Mogog, Marinduque through this GMAP program. The seedlings and bamboos were produced particularly for bioremediation of the 1.0 ha mine tailing dumpsites at the back of Brgy. Iho Elementary School in Mogog, Marinduque. With the limited budget allocated for bamboo propagation in this NRCIP-funded project and with a very large tract of CDAs in Marinduque that needs immediate attention for rehabilitation, we can expand our rehabilitation effort once this proposal gets funded so that much greater community could benefit. Consistent with the vision of former Hon. Governor Lord Allan Jay O. Velasco, we also envisioned to make Marinduque an island of bamboo and a center of bamboo industry in the Philippines. Due to its fast growth there is a quicker and greater return on investment (ROI) hence the GMAP/MoT project will open up greater livelihood opportunity for the community. In August 1998, a significant leak in the Mangog mine pit was discovered to have been the culprit in the flashfloods that drown low lying communities in Sta. Cruz and Mogog, Marinduque. This left a remarkable and horrible nightmare among these communities and devastated large tract of lands and farmlands that were still contaminated with heavy metals up to present. This continuously posed risks to both human, wildlife and vegetation. All the areas, apart from the mine tailings dumpsites, that had been submerged to flashfloods and were left as CDAs are the target of this proposal which will use bamboo as the phytoremediation species.  | Publication:<br>Pp<br>Year 1<br>Year 2<br>Year 3<br>Total<br>Publications<br>A.<br>Ae <sup>o</sup> Produced 1 AWP<br>Ae <sup>o</sup> Produced 1 IEC materials<br>A.<br>Produced 1 journal article/chapter-in-a book published in a reputable international publisher  | University of the Philippines Los Baños (UPLB) | LGU<br>Academe<br>Farmers<br>Foresters<br>Nursery men<br>Students and teachers at study site<br>Local residents/communities<br>People's „,„s Organization  | 01-Aug-24 | 31-Jul-27 | ONGOING                          | 5,000,000          | 1,986,334.20     |
|               | S&T Community-Based Farm (STCBF) for Sustainable Production and Market Linkage of Smallholder Seaweed Growers Group  | Rapid, inclusive and sustained economic growth | NULL   | EXPECTED OUTPUTS (Pps)<br>YEAR 1<br>YEAR 2<br>TOTAL<br>Products<br>Covered 8 hectares adopting 6a/Standard method<br>Produced 60MT dried seaweeds for international and/or local market<br>Produced and marketed 7.3K liters seaweed drippings as foliar fertilizer through DSSC<br>Established 1 drying area as community-shared facility with 5 dryers with dripping collector and 2 final dryers<br>Consolidated dried seaweeds and drippings as synchronized production   | Davao del Sur State College (DSSC)             | Men and women seaweed farmers of Digos City  | 01-Oct-24 | 30-Sep-26 | ONGOING                          | 5,000,000          | 3,854,779.00     |
|               | S&T Community-Based Farm (STCBF) on Harnessing the Synergy of Vegetable Production and Stingless Beekeeping (VegeBee)  | Rapid, inclusive and sustained economic growth | The project will utilize vegetable farming and beekeeping technologies to provide additional sources of income to the community, contribute to ecosystem services, biodiversity conservation, and promote social responsibility particularly in the community. The project will be implemented in the three municipalities of Cavite: Indang, Silang, and Alfonso for the implementation of the project. The beneficiaries will be given vegetable seedlings or farming materials, stingless bee colonies and other beekeeping equipment. Training on beekeeping, vegetable farming, and post-harvest technologies will be conducted to capacitate the beneficiaries. Stingless beekeeping will produce several bee products that can be an additional source of income to the beneficiary, like honey, pollen, propolis, and even the stingless bee colony.   | EXPECTED OUTPUTS (Pps)<br>Y1<br>Y2<br>Total<br>Products<br>—&nbsp;nbsp;nbsp;Harvested<br>5,775 kgs of assorted vegetables (10% yield increase, from 350kgs to 385 kgs per 200 m2)<br>—<br>Harvested<br>a total of 75 kgs honey, 7.5 kg pollen, 7.5 kg propolis, and 15 additional stingless bee colonies from spilling<br>—<br>Installed<br>75 stingless bee colonies, 75 hive boxes, 15 hive tools, 15 bee veils<br>—<br>Harvested   | Cavite State University (CVSU)                 | 15 farmers from Indang, Alfonso, and Silang, Cavite  | 01-Oct-24 | 30-Sep-26 | ONGOING                          | 4,440,820          | 2,705,660.00     |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---------------|--|---|---|--|---|---|-----------|-----------|----------------------------------|--------------------|------------------|
|               | S&T Community-Based Farm (STCBF) on Sustainable Cacao Production through Improved Management Practices in Alfonso, Cavite  | Rapid, inclusive and sustained economic growth                            | The project titled is a collaboration between Cavite State University (CSU) and the Municipal Agriculturist Office (MAO), Alfonso, Cavite, supported by DOST-PCAARRD. It aims to enhance cacao farming in Cavite by transferring S&T-based technologies, capacitating farmers through seminars and training, and promoting wider adoption of improved practices. Conducting Farmer's Field School (FFS) sessions will address gaps in farming and entrepreneurial skills, market orientation, and technology adoption among cacao farmers. The initiative, with support from CSU, MAO, and the Office of Provincial Agriculturist (OPA) Cavite, will equip farmers with skills to boost crop yield, ensure sustainability, and improve livelihoods. Technical support, seminars, and necessary materials will be provided, ultimately leading to enhanced cacao productivity, quality, and profitability in Cavite.   | YEAR 1<br><br>A. Products<br>Produced at least 1,000 kgs of fresh and dry cacao beans<br><br>B. People and Services<br>Trained at least 30 cacao farmers<br><br>Conducted three (3) trainings<br><br>Adopted five (5) PO's<br><br>Engaged on social media at an average of 20/month (i.e. likes, shares, comments, inquiries)<br><br>Generated five (5) jobs<br><br>Conducted five (5) seminars/webinars   | Cavite State University (CVSU)  | 30 Cacao growers and farm owners, entrepreneurs in Alfonso, Cavite (farmer beneficiaries)Other people/enthusiasts who may want to engage in cacao farming | 01-Jun-24 | 31-May-26 | ONGOING                          | 4,901,360          | 3,066,960.00     |
|               | S&T Community-based Farm for Sustainable Lowland Vegetable Production in Cagayan Province  | Rapid, inclusive and sustained economic growth                            | Lowland pinabete vegetables including okra, eggplant, tomato, ampalaya, sitao, squash, and pepper are usually grown in region 2, particularly in Cagayan province, due to climatic and environmental suitability as well as the availability of other resource factors required for their favorable growth and development. Hence, the high demand for the said group of vegetables. Good Agricultural Practices (GAP) and S&T-based technologies generated by DOST-PCAARRD and Cagayan State University will be utilized in the implementation of the project. It intends to involve three (3) vegetable-growing municipalities in the province, wherein five (5) barangays in each municipality will be selected for the establishment of S&T community-based farms.  | Publication: 3 Publication ArticlesPatent: 1 Copyrighted Video DocumentationProduct:<br>15,365.84 kg harvested and marketed lowland pinabete vegetables per farmerAd -rns production area A (3,200 sqm) within the project duration.<br>The breakdown of harvest/commodity/cropping for every 400 sqm production area is as follows:<br>Ampaya Ad -rns 483.8 kg;<br>Bunbun Sitao Ad -rns 418 kg;<br>Pole Sitao Ad -rns 402.8 kg;<br>Okra Ad -rns 380.76 kg;<br>Eggplant Ad -rns 325.56 kg;<br>Tomato Ad -rns 431.8 kg;<br>Pepper Ad -rns 495.32 kg;<br>Squash Ad -rns 563.32 kg.<br>Note that all harvested vegetables will be sold/ marketed<br>1 GAP Certification<br>3 developed IEC materials on PO's generatedA,<br>24 hectares of land area planted with lowland pinabete vegetables (75 farmers with 3,200 sqm per farmer production area)<br>People:<br>150 Profited men and women vegetable growers<br>10 Capacity building on social preparation, simple bookkeeping and accounting and GAP on vegetable production conducted with at least 150 participants<br>150 copies of IEC materials on PO's generated by CSU and DOST-PCAARRD reproduced and distributed<br>75 A assisted A men and women vegetable grower cooperators<br>3 organized and assisted A men and women vegetable growers association<br>Place:<br>75 Forged Memorandum of Understanding with men and women vegetable grower cooperators<br>3 Forged Memorandum of Agreement with partner LGUs<br>Policy:<br>1 policy (Municipal ordinance on Vegetable Production following GAP) | Cagayan State University (CagSU)  | Vegetable growers in the target municipalities<br>Consumers   | 01-Jan-23 | 31-Dec-24 | ONGOING                          | 5,000,000          | 1,158,460.00     |
|               | S&T Community-Based for Inclusive Development (STCAD) on Livelihood Improvement of Mangyan Communities in Mindoro through Science and Technology (S&T) Interventions | Rapid, inclusive and sustained economic growth                            | Anchored on STCAD Program that emphasizes inclusive development, this project focuses on IPAs, contributing to the broadening of the inclusivity spectrum of the program. Particularly, this is in addition to the two different sectors assisted by the program which include conflict and conflict-vulnerable areas and geographically isolated and disadvantaged areas. This project focuses on IPAs to apply extension modalities in their communities to establish sustainable ANR livelihoods. What sets this initiative apart from the STCAD and LIFE-DULL is the inclusion of literacy component involving provision of basic literacy and numeracy activities to children and adults but also provision of scholarships to deserving students. This aims to provide lasting and stronger impact to the communities. Specifically, it aims to improve food access and availability, increase household incomes, and to empower the IPAs through education. These interventions also aim to prepare the IP communities to other possible assistance they can avail from other organizations.   | Publication:<br>5 Traditional Cooking Recipe<br>3 Basic Numeracy, Reading and Writing<br>3 Traditional/Indigenous Medication<br>Patent: Copyright of IEC MaterialsProduct:<br>1 hectare sustainable farm with two or more specific commodities<br>Fresh produce of root crops, vegetables, calamansi, corn and condiments<br>Processed products of calamansi, rootcrops, seaweed and vegetables<br>Handicrafts<br><br>People:<br>200 Mangyans trained for the following:<br>Package of Technology (POT) for root crops production<br>POT for Banana, Coconut and Corn<br>POT for Calamansi, Soursoy, Vegetable Crops<br>Food Processing and Value Adding<br>Handicrafts Making<br>Agricultural Marketing and Strategies<br><br>100 Mangyans were taught the basic literacy and leadership skills<br><br>Produced at least 5 Mangyan Leaders which would lead their community in progress<br><br>10 Mangyans completed the Certificate in Entrepreneurship from the UniversityPlace:<br>MOA between collaborating agencies<br><br>Provincial Agriculture, LGU, Department of Agriculture, DOST, PCAARRD, NCI, PMU and DTI/DepEd.<br>1 Policy draft for support to Mangyans for their livelihood and literacy program recommended to LGUs involved in the project  | Mindoro State University (MinSU)  | Selected Mangyan communities from Oriental Mindoro  | 16-Jan-23 | 15-Jan-26 | ONGOING                          | 14,570,984         | 4,777,328.00     |
|               | S&T Community-based Nursery, Plantation Establishment and Management of Giant Bamboo (Dendrocalamus asper, Schult Backer) in Dalwangan, Malaybalay City, Bukidnon    | Integrity of the environment and climate change adaptation and mitigation | Bamboo is one of the fastest-growing and highest yielding renewables and at the same time is a highly versatile natural resource. In the Philippines, bamboo are intertwined with our environment, economy and culture. They are used in construction, furniture, and handicraft manufacture. The Philippines ranks 6th in the world as the largest exporter of bamboo products and because of its many uses, bamboos have been popularly used by many communities. Investors are coming to the country with a very promising livelihood opportunity for the people. Although bamboo is abundant in the country, the existing resource cannot cope up with the demands of these investors both in the quality and quantity of the resources. The Philippine Bamboo Foundation reported that up to 52,000 hectares of land in the country are planted with bamboo but this could not meet the increasing market demand. As of 2010, market needs 575,000 handicraft poles and 3.5 million furniture poles.<br><br>Giant bamboo (Dendrocalamus asper) is among the ten commercially-important bamboo species identified by the Philippine Bamboo Industry. It is a very large, dense-clumping, evergreen species native to Southeast Asia. It grows up to 20 m tall and 12 cm in diameter. Younger plants are covered with fine velvety brown hairs. It is widely cultivated for its highly valued culms that are used as a building material and its shoots that are used as a vegetable. Upper internodes of the culm are used as containers for water or to collect juice being tapped from palm inflorescence. In Java, these are used as tomato stakes, poultry floors, and in making engineered bamboo products.<br><br>Moreover, PCAARRD has identified improved nursery, plantation, and post-harvest management practices for bamboo as one of the important technologies in their Industry Strategic Science and Technology Plans (ISSTP). Also, the Farm and Industry Encounter through the Science and Technology Agenda (FESTA) conducted last 2018 highlighted bamboo production as one of the technologies for entrepreneurship. This has increased the interest of the farmers because of the promising benefits they will gain from this commodity. Thus, there is a need to focus on S & T activities to support the development of the Philippine Bamboo Industry through a community-based approach. The S & T Community-based Nursery and Plantations as a techno-transfer modality will assist the bamboo nursery growers and plantation farmers in building a strong and unified alliance towards supporting the bamboo industry. With the availability of information, technologies, and existing healthy bamboo stands improved productivity and profitability ensuring a stable supply of raw materials for the bamboo-based industry can be realized through the convergence of potential partner agencies and other entities. | Products:25,000 planting materials from selected bamboo stands in the established S&T community-based bamboo nursery produced 80 bamboo shoots from 10 established demonstration plots produced People and Services 1 S&T community-based bamboo nursery established 3ha S&T bamboo demonstration plantation established/added products for bamboo shoots/food processed bamboo shoots)<br>1 farmer group with at least 15 cooperators organized2 capacity building and capacitated 45 bamboo farmers conducted 1 Farmer's Forum on Bamboo-Industry Development to be attended by 70 participants conducted Publication's technology guide on Bamboo Planting, Harvesting, and Processing and produced 100 copies for distribution packaged produced 1 documentary video material highlighting the STCBF modalityPlace: MOA with partner partners forged Polished policy recommendation to the LGU to intensify the support to bamboo related activities drafted Patent/Copyright of the technology guide being registered   | Ecosystems Research and Development Bureau (DENR-ERDB)  | Bamboo growers in Dalwangan, Malaybalay City, Bukidnon  | 01-Aug-21 | 31-Dec-24 | ONGOING                          | 4,999,998          | 572,905.00       |
|               | SAFE: S&T Interventions to Improve Quick Response to Calamities and Natural Disasters in CALABARZON, MIMAROPA and Ilocos Region                                      | Rapid, inclusive and sustained economic growth                            | SAFE: S&T Intervention to Improve Quick Response to Calamities and Natural Disasters project will cover the production of fresh vegetables for quick and free distribution as relief goods to calamity-stricken regions in Luzon. Since the production of fresh vegetables is all year round, the vulnerable and underprivileged communities in CALABARZON, MIMAROPA and Ilocos regions will be the beneficiaries. Moreover, continuous vegetable seed production and other plant materials support sustainable backyard gardening in households in different regions.  | Publication: 2A. Video documentation of events and distributors in calamity-stricken areas;<br>3. Documentation reports and lessons learned;<br>3 IEC materials developed and distributedPatent: N/AProduct: 5 PO's demonstratedA<br>119,200kg A-assured vegetables produced for distribution to identified beneficiariesA People: at least 20A barangays assisted;<br>at least 10 families assisted A Place: 3A. Institutional collaborations established and strengthenedPolicy: NA  | Bureau of Plant Industry - Los Baños National Crop Research Development and Production Support Center (BPI-LBNCRDPSC) | Disaster prone/stricken communities<br>Households/ families<br>Students<br>Farmers<br>Senior citizens<br>Children/minors                                  | 01-Jan-23 | 31-Dec-24 | ONGOING                          | 5,000,000          | 2,073,421.19     |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---------------|---|---|--|--|--|--|-----------|-----------|----------------------------------|--------------------|------------------|
|               | SciCAT Expansion: Enhancing the KAMALIG (Keeping A Modern Agricultural Landscape through Integrating CLSU-Generated Technologies) Agritourism Site  | Rapid, inclusive and sustained economic growth                            | This project aims to expand DOST-PCAARRD's Science for the Convergence of Agriculture and Tourism (SciCAT) Program to other institutions like state universities and colleges (SUCs) showcasing PCAARRD and agency generated technologies. This will institutionalize the newly developed KAMALIG Model Farm to meet the agritourism needs of the industry and to provide inspiration in addressing food sufficiency and security in the Philippines and around the globe on a large scale. As an agritourism site, it carries the tagline "Eat, Sip, Sip, Sip, Sip" as a slogan for a sustainable and integrated system for CLSU's agritourism. The motto of the Tagalog term "Kamali" depicts the simplicity of the project's objective to house and showcase CLSU mature technologies that are ready for adoption and become instrumental in the attainment of sustainable development goals. | Publication: 1 published paper, 3 brochures; 1 AWP; 1 agricultural operations manual; Patent: 1 logo trademark for KAMALIG; 3 brochures and 1 AWP copyrighted; 1 agricultural operations manual copyrighted; Product: 1 website; 1 mobile application; 1 Fo page; 1 communication plan; 30 technologies showcased; 1 guest journey map; People and Services: 100 tourists/day on 800 tourists/year (0.8% of the expected daily tourists based on real carrying capacity), which include: 100 farmers, 24 MAO personnel, 7 entrepreneurs, 7 agricultural cooperatives, 7 farm tourism operators, 50 teachers, 4,580 students, and 5 researchers; Places and Partnerships: 3 LGUs, 2 NGOs, 4 HEAR; 1 policy brief regarding the adoption of economically and environmentally viable technologies   | Central Luzon State University (CLSU)          | KAMALIG Model Farm intends to cater trainees, adopters and tourist learners which include 120 farmers, 24 MAO personnel, 7 agricultural cooperatives, 7 farm tourism operators, 7 entrepreneurs, 4,580 students/hobbyists/other guests, 50 teachers, and 5 researchers. Farmers from Central Luzon will undergo training and adopt the technologies appropriate to them. Municipal/City Agricultural Office personnel of Nueva Ecija will undergo training of the different CLSU-developed technologies so that they can also extend the knowledge to their farmer constituents. MSMEs from other provinces, having capital investment, will be interested to enter the value-chain of the commodities by adopting the developed products. Agricultural cooperatives have the financial capability to invest in adopting the technology of processing the products or enhance their products. Farm tourism operators will be inspired to adopt the science-based technologies in farming, thus, improve their areas to attract more tourists. Students, from all levels, will be inspired to engage in farming as they will be exposed to smart farming technologies, the science of agriculture and animal science. Teachers, as tourist learners, will also facilitate learning by reinforcing the value of agriculture. Researchers may be able to identify research gaps that can improve agricultural production. | 16-May-24 | 15-May-25 | ONGOING                          | 5,000,000          | 5,000,000.00     |
|               | Science and Technology Action Frontline for Emergencies and Hazards (SAFE) - LIGTAS: S&T Interventions to Improve Quick Response to Calamities and Natural Disasters in Regions 1, 2, and CAR | Poverty reduction and empowerment of the poor and vulnerable              | The project intends to provide its share to the government initiatives and other organizations to develop an immediate S&T intervention that improve calamities and other natural disasters quick response. Likewise, this project will establish and intensify the implementation of the poultry (native chicken and duck), rice, tilapia grow-out, and mungbean production. Some of the project components are part of the recently completed joint project DOST-PCAARRD started by Cagayan State University which were a component of the previous DOST-PCAARRD funded project. Such is a potential to produce agricultural products that will support disaster-prone communities in reducing vulnerability to the impacts of natural hazards and climate-related disaster. This project will be implemented through the 2 agricultural campuses of the university.                           | Publication: One (1) video documentation for the project One (1) dissemination report and lessons learned Three (3) publication article Patent: Copyright registration of one (1) video documentation Product: At least 2,000 packs of Agricultural products prepared and distributed to calamity-stricken areas At least 8 POTS generated At least 450 chicken pullets raised At least 31,075 chicken eggs produced At least 1,000-day-old chicks raised At least 500 hardened chicks raised At least 525 chickens raised for slaughter At least 380 culled chickens At least 440 duck pullets raised At least 480 culled ducks At least 60,433 duck eggs produced At least 15,000 balut At least 15,000 salted eggs At least 2,750 kg tilapia produced 2 hectares of peanut production to generate yield of 9,000 kilograms in a year 3 hectares of mungbean production to generate yield of 4,000 kilograms in a year 1.5 hectares of corn production to generate yield of 90,000 ear of corn in a year 3 hectares of rice production to generate yield of 30,000 kilograms of paddy rice in a year 0.75 hectares of sweet potato production to generate 7,500 kilograms in a year 20,400 kilograms of milled rice produced in a year People: At least 2,000 families assisted through distributed relief packages Place: At least 2 institutional collaborations established/strengthened with MOA Policy: 1 policy (GAP on crop, poultry, and aquaculture production) | Cagayan State University (CagSU)               | Chicken growers in the target municipalities<br>Duck growers<br>Tilapia growers in pond<br>Rice, corn, sweet potato, mungbean, and peanut growers<br>Consumers/Buyers<br>Calamity/Disaster victims<br>Processors   | 01-Jan-23 | 31-Dec-24 | ONGOING                          | 5,000,000          | 2,162,860.00     |
|               | Science and Technology Community Based Farm (STCBF) on The Production of Sweetpotato Flour as Substitute for Wheat Flour  | Integrity of the environment and climate change adaptation and mitigation | The project focused on the production of sweetpotato for processing into sweetpotato flour.  | Publication: Year 1: One (1) Flyer One (1) research publication Year 2: One (1) Video of success stories One (1) Magazine Patent: Year 1: Filed Utility Models for 2 Products Year 2: Filed Utility Models for 3 Products Product: Year 1: 99,000 planting materials produced 6 tons of SP harvested/hectare 24,000kg of SP tubers harvested for processing (2 ha with 2 croppings) 3,600 kg of SP flour produced (30%) Two (2) processed bread and pastries products with 10-15% SP flour content as substitute to wheat flour Year 2: 200,000 planting materials produced 8 tons of SP harvested/hectare 32,000 kg of SP tubers harvested for processing (2 ha with 2 croppings) 6,800 kg of SP flour produced (30%) Three (3) processed bread and pastries products with 10-15% SP flour content as substitute to wheat flour prepared by the selected bakeries People: Year 1:   | Samar State University (SSU)                   | Sweet Potato Farmers and Women's Associations in Basey, Samar  | 01-Oct-22 | 31-Dec-24 | ONGOING                          | 5,000,000          | 611,816.06       |
|               | Sustainable Mangroves through Innovations and Livelihood Enhancement Promoting Growth and Climate Resilience (SMILE-Growth)   | Integrity of the environment and climate change adaptation and mitigation | This project will look into the socio-ecological, socio-economic and socio-institutional systems of the mangrove communities and understand how these lead to sustainable and climate-resilient mangrove management. Potential S&T-based livelihood and social enterprise innovations that will further promote socio-ecological and economic well-being will be explored. Strategies for their technology transfer and effective adoption will likewise be pursued and applied.   | Products<br>- Characterized 2 mangrove socio-ecological system<br>- Produced 2 mangrove cover maps<br>- Characterized 2 livelihood systems/activities<br>Produced<br>1 training module<br>Places and Partnerships<br>Established 2 partnerships and linkages (i.e. LGUs, SUCs, NGOs)<br>-<br>Conducted 2 benchmarking activities in successful mangrove CBMs<br>Conducted 1 cross-visit<br>People and Services<br>- Identified 30 farmer cooperators<br>- Conducted 1 workshop/ focus group discussion with PO, LGU and other relevant stakeholders per site<br>- Trained 30 farmer cooperators<br>- Conducted 2 trainings on S&T-based livelihood development<br>- Supported 2 student researches (1 PhD and 1 undergrad)<br>Publications<br>Produced 1 journal article/ chapter-in-a-book published in a reputable international publisher<br>- Produced 2 IEC materials<br>- Produced 1 AWP<br>- Produced 1 training module<br>Patents<br>Filed 3 copyrights (2 for IEC materials and 1 for training module)  | University of the Philippines Los Baños (UPLB) | The following are the target beneficiaries of the project:<br><br>CBFM members<br>Other mangrove communities<br>Government agencies such as the DENR, DA, BFAR, etc.<br>Non-government agencies<br>LGUs<br>SUCs and academes<br>Private organizations<br>Policy makers   | 16-Oct-23 | 15-Oct-25 | ONGOING                          | 5,000,000          | 1,498,052.00     |

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|---------------|--|--|---|--|---|--|-----------|-----------|----------------------------------|--------------------|------------------|
|               | TechKNOW: Strengthening Technology Transfer for Stronger University-Industry Collaboration for Sustainable Development | Rapid, inclusive and sustained economic growth | The innovation ecosystem in the country has made significant progress over the years. However, it is important to note that there are still gaps in the ecosystem that must be addressed such as limited access to capital or funding, limited market access and scaling opportunities, and limited support services. In addition, universities are still navigating through technology transfer. As a point of fact, even though UPLB has licensed several technologies in the past, every new licensing negotiation brings about new concerns and issues that should be addressed, demonstrating the fact that technology transfer is not a linear process, but one that requires adaptability and continuous collaboration among the different stakeholders. This project aims to address the gaps and challenges mentioned above. It also aims to contribute to the vision of UPLB to be the country's agora or marketplace that will provide support, market access, and scaling opportunities to MSMEs and inventors for their pioneering innovations. It also aims to be a collaborative and interactive program among the UPLB Business Affairs Office (BAO), Technology Transfer and Business Development Office (TTBDO), Office of the Vice-Chancellor for Research and Extension (OVCRE), and Office of Public Relations (OPR) that supports entrepreneurship and skill development and promotes awareness and industry or community adoption of UPLB developed products, services, and experiences. This is a marketing and learning platform for our researchers and academics to meet partner MSMEs, industry players, and investors. This project is also in line with the vision of PCAARRD to promote excellence in agriculture, aquatic, and natural resources innovation.  | A. Products<br>24 Product pitches conducted<br>1 Website maintained<br>1 Database of MSMEs maintained<br>24 Workshops conducted<br>2 Pilot-scale designs prepared<br>5 Packaging designs prepared<br>5 Commercialization Plans prepared<br>5   | University of the Philippines Los Baños (UPLB)  | The target beneficiaries are the following:<br>University Researchers, Students and Staff<br>Industry Farmers and Collaborators<br>MSMEs within the community  | 16-Jan-24 | 15-Jan-26 | ONGOING                          | 4,817,136          | 2,781,068.00     |
|               | Upscaling Adoption of S&S Plaza Innovations Towards SciCAT Farm Replication  | Rapid, inclusive and sustained economic growth | The S&S Plaza is a 9 hectare (ha) organic science-based farm tourism site located inside the BPH-LBNCRDPSC's compound, near the DOST-PCAARRD Technology Innovation Center (PTIC) building. Its history started in 2013 when BPH-LBNCRDPSC partnered with the DOST-PCAARRD on the project Technology Demonstration and Capacity Building for Lowland Vegetable Production. After which, several projects have been implemented in the area under the SciCAT program of TTPD-PCAARRD. The plaza serves as a learning hub which showcases facilities to encourage farmer-entrepreneurs and young generations to adopt PO's that can contribute to achieving food security and sufficiency in the country. Moreover, it showcased promising agri-tourism business opportunities through a continuous process of technical and skill learning.   | 6Pa Metrics<br>Y1<br>Y2<br>TOTAL<br><br>Publications<br><br>IEC materials (brochures, leaflets or posters & videos for social media) developed   | Bureau of Plant Industry - Los Baños National Crop Research Development and Production Support Center (BPH-LBNCRDPSC) | LGU partners<br>Existing technology takers<br>Tourists i.e. Farmers, Entrepreneurs, Students, Professionals, Extension workers, Senior citizens, PWDs, Public organizations, Private Organizations, Hobbyist | 01-Aug-24 | 31-Jul-26 | ONGOING                          | 5,000,000          | 2,569,392.00     |
|               | Upscaling Vegetable Production in Salangsang, Lebak, Sultan Kudarat through S&T Community Based Farm (STCFB) Modality  | Rapid, inclusive and sustained economic growth | The project will be implemented in Brgy. Salangsang, Lebak, Sultan Kudarat which is known with ideal climate for vegetable growing in the municipality of Lebak, Sultan Kudarat. The project aims to upscale the productivity of vegetable farms through the STCFB technology transfer modality within the project duration of 2 years. Under this project, the re-introduction of key technologies in the vegetable production chain or the Good Agricultural Practices for Vegetable Farming such as input provision (seeds, fertilizers, pesticides, agri-facilities, and other facilities), field management (crop diversification, fertilizer application, irrigation, pest and disease management, harvesting, sorting, packaging, and transport) shall be done. Other science-based technologies that will ensure increased productivity of vegetable farms and improved quality of harvest shall be worked on with farmers, specifically on postharvest and processing, trading, and marketing (sorting, grading, cleaning, processing, storage, and distribution). These technologies should fill up the critical S & T gaps in the production operations of vegetable farmers in the municipality of Lebak in the Sultan Kudarat Province. With the expected improvement in the productivity of vegetable farmers through upscaled intervention in the vegetable production project site, similar activities can be replicated in close barangays within the municipality or nearby places in the Sultan Kudarat province. Through STCFB project, technological interventions previously introduced can be mastered and sustainably adopted by the farmers to upgrade their traditional methods in vegetable farming. Capacity-building activities are popular means that can strengthen the knowledge, skills and attitudes of farmers. The agricultural agencies promote farming strategies that are environment-friendly and ably minimize the negative impacts to humans socially, economically, and environmentally. Moreover, the STCFB framework is a timely tool for planning extension projects, sharing lessons learned and good practices through technology demonstrations, training or workshop, and related activities. The farmers shall be assisted technically in the adoption and showcasing the good agricultural practices for vegetables on their farms. The provision of a multipurpose hub/off-farm facility that will serve as a storage/packaging/consolidation/food processing area/marketing/trading facility can also be helpful to maintain the quality of vegetable products downloaded from the farms to the target markets and to trading venues. | YEAR 1<br>A. Products<br>Increased volume of vegetable production to 15% from average production yield of 1,840.10 (2019-2021 STCAD Project)<br>Produced and marketed two (2) of the five (5) processed products (squash bread sticks and taro chips from STCAD project) with improved quality<br>B. People and Services<br>Trained/Revitalized one (1) farmer association with 30 farmer-cooperators<br>Conducted two (2) trainings<br>Conducted one (1) field day<br>Conducted one (1) techno cross visit  | Sultan Kudarat State University (SKSU)  | 30 Vegetable Farmer-cooperators/20 Non-cooperator Farmers/Vegetable-based entrepreneurs/Extension workers of cooperating agencies  | 01-Jun-24 | 31-May-26 | ONGOING                          | 5,000,000          | 2,844,556.00     |
|               | DOST-PCAARRD Startup Grant Fund (SGF) Program  | Rapid, inclusive and sustained economic growth | 7JF Steel Fabrication intends to license and adopt the AgriAqua related technologies developed by CAPSU. These technologies include the Coconut Dehusking Machine, the Roller-Type Litter and Presser Machine for Fruit Extraction, and the Twining Machine which were already filed for patent protection by the university. The firm has envisioned themselves to be the partner of the university in driving innovation and commercialization of research outputs particularly the agri-aqua related technologies.   | Publication/At least 2 IECs and other promotional materials of the licensed technologies developed; Patent/At least 2 copyrights of IECs developed; Product/At least 3 tech commercialized through licensing with FOR and TL/At least 3 Farmers Opinion Report (FOR) for technology licensing received/At least 1 Roller-Type Sifter and Presser for Juice Extraction fabricated and sold in a year/At least 1 Twining Machine fabricated and sold in a year/At least 1 Coconut Dehusker fabricated and sold in a year/People and Services/Services/At least 3 employees to work for the project hired/At least 3; staff regarding steel fabrication trained/Places and Partnerships/Partnerships/At least 1 Linkage with other government agencies such as DA, DAR, NFA, etc./At least 1 Collaboration with other potential private partner such as RU Foundry & Machine Shop Corp./At least 1 MOA/MOU with potential private partners or government agencies for; At least 1 participation during agri-tech technology exhibit in the region; Policy   | 7JF Steel Fabrication   | Community Government Academe   | 01-Sep-24 | 31-Aug-25 | ONGOING                          | 1,997,000          | 1,997,000.00     |
|               | DOST-PCAARRD Startup Grant Fund (SGF) Program  | Rapid, inclusive and sustained economic growth | Bencal's cacao beans exhibit distinct flavor profiles shaped by various factors such as soil composition, rainfall, production methods and processing. Bencal's products are made from these beans, enabling consumers to experience these unique nuances, showcasing Pangantucan's influence on the beans. Bencal's aims to narrate the story behind each bean, highlighting the growers, sustainable farming practices, and the inherent flavors in their cacao beans. The commitment to ethical sourcing, reflected in good agricultural practices and fair-trade principles, resonates with customers valuing transparency and responsible production.  | Publication/At least 1 Operations Manual developed and printed; At least 1 business plan revised and printed/At least 1 sustainability plan developed/At least 1 promotional video developed; At least 1 Online Advertisement boosted; At least 2 IEC material developed (brochure, Byers, signages); Patent / At least 1 trademark/fieldtrip; At least 1 copyright/fieldtrip/Product: Produced and sold 100 kg of dark chocolate in 1 year; Produced and sold 100 kg milk chocolate in 1 year; Produced and sold 100 kg white chocolate in 1 year/Business Registration renewed/FDA, LTO Permit Renewed; Applied for FDA-CF/People and Services/Services; At least 2 trainings attended by 3 Bencal's Food Products Staff/At least 1 benchmarking activity attended by Bencal's Food Products Staff/Places and Partnerships; At least 3 partnerships established with private sector and 1 government agency; Policy/Policy/1 policy recommendation developed; Policy   | Bencal's Food Product   | Cacao growers in Pangantucan, Bukidnon   | 01-Sep-24 | 31-Aug-25 | ONGOING                          | 1,935,000          | 1,935,000.00     |
|               | DOST-PCAARRD Startup Grant Fund (SGF) Program  | Rapid, inclusive and sustained economic growth | Farmvocacy's PALAYAN-Pawshop helps support smallholder rice farmers who want to take advantage of seasonal variations in grain prices, lenders who want secure, liquid, and profitable investment, and commodity buyers who demand quality produce at competitive prices. Compared to banks, lenders, and informal lending institutions, Farmvocacy's PALAYAN-Pawshop is the only financial product that allows farmers to increase commodity prices while providing safe, secure, and liquid to lenders.   | Publication/At least 1 Article/ Paper Presentation detailing project processes and results and submission of White Paper as requested by DOST-MIMAROPA Regional Technical Evaluation Committee (RTEC) Patent/At least one (1) patent filed for any of the prototypes to be produced. Product/PALAYAN-Pawshop - Digital Commodity Exchange Platform/One (1) MVP/ prototype for Farmers; One (1) MVP/ prototype for Lenders; One (1) MVP/ prototype for Buyers. Minimum of One Hundred Metric Tons of palay or rice to be deposited in the PALAYAN-Pawshop in one year/Project Duration/People and Services/Training one (1) personnel to store, maintain, and monitor grain quality used as collateral for financing. Storage services and warehouse receipts system installed for participating farmers Place and Partnerships: Value chain actors/ One (1) rice miller, two (2) Farm machinery owners, Onboard twenty (20) Rice retailers, and institutional buyers One farming community with a total of forty (40) rice growers. Trained at least three (3) lenders to observe the pilot and get their feedback. Policies Policy/Operating policies for warehouse receipts system | Farmvocacy Inc.   | One farming community with a total of forty (40) rice growers from Calapan City, Oriental Mindoro.   | 01-Sep-24 | 31-Aug-25 | ONGOING                          | 1,961,720          | 1,961,720.00     |

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|---|--|---|--|---|---|--|-----------|-----------|---------------------------------|--------------------|------------------|
| DOST-PCAARRD Startup Grant Fund (SGF) Program   | Enhancing the Operational Capacity, Product Quality, and Market Reach of 4G Ice Cream House  | Rapid, inclusive and sustained economic growth                            | The growing market demand for 4G Ice Cream House's unique and delightful ice cream flavors demonstrates its potential for expansion. The positive responses from customers underline the business value and its ability to cater to the evolving tastes and preferences of the local community. Another significant development in this proposed venture is the adoption of CAPSU ice cream technology. Currently, Capiz State University developed a seafood ice cream that will promote the local taste of the province, especially if it is being dubbed as the 'Seaside' capital of the Philippines. This initiative will not only promote the tourism industry of the province, but it will also provide the customer with a unique product when it comes to ice cream flavor.  | Publication/Developed 3 IEC materials/Patent/At least 3 IEC materials filed for copyrights/Products/At least 2 CAPSU technologies adopted through licensing with FOR and TLA. At least 20 tubes of Seafavor Ice Cream produced and sold in a year. At least 20 tubes of Ginger favor Ice Cream produced and sold in a year. At least 200 tubes of Ice Cream additional produced in a year (seasoned flavors). People and Services/At least 3 additional employees hired. At least 3 additional employees hired. At least 3 additional employees hired. Partnerships/Partnerships Sponsor/participate at least 3 community events, festivals, and celebrations across different towns and municipalities in Capiz/For at least 1 partnership to collaborate with local market for distribution/At least 2 participations to local and regional Pitching Events. At least 2 trainings attended per year related to business Policy.   | 4G Ice Cream House                            | Local Community Residents Employees and their families/ Capiz State University Customers beyond the local community Local Entrepreneurs in related industries  | 01-Sep-24 | 31-Aug-25 | ONGOING                         | 1,905,000          | 1,905,000.00     |
| DOST-PCAARRD Startup Grant Fund (SGF) Program   | Product, Process, and System Improvement of Ebang'Z Mushroom Farm  | Rapid, inclusive and sustained economic growth                            | Ebang'Z Mushroom Farm is a startup business that specializes in the production of fresh and processed Oyster Mushroom products. The business was founded by Ms. Neiva dela Torre in 2018. Her journey into mushroom farming began when she identified a market gap for locally sourced mushrooms produced by the Regional Agriculture Training Institute. This training equipped her with the knowledge and skills necessary to embark on mushroom cultivation.  | Publication/Developed 2 IEC materials for the farm and products/Patent/Filed 2 copyright materials/Products/At least 2,000 trailing bags pasteurized per month, 24,000 in a year. At least 2,000 trailing bags under effective and efficient lagging process per month, 24,000 in a year. At least 450 kg of fresh mushroom produced per month, 5,400 kg in a year. At least 270 of mushroom chicharon and 150 kg of mushroom kropek undergo drying per month. 3,240 kg of chicharon and 1,800 kg of kropek undergo drying in a year. At least 1,800 packs of mushroom chicharon and 3,000 of mushroom kropek output during packaging per month, 24,000 packs of chicharon in a year and 30,000 packs of kropek in a year. Licensed at least 3 CAPSU technologies. Application for FDA Compliance People and Services/Attend 4 trainings about Mushroom Technology and farming/4 Capacity building training for the Ebang'Z Mushroom staff on training related to Mushroom Farming and production/Places and Partnerships/Partnerships/Linkage with Mushroom Association in the province and in the Region/Policy/Develop at least 1 Green Practice Action Plan.  | Ebang'Z Mushroom Farm                         | Local Mushroom farmer in Capiz/ Local small business entity that will help in the selling of the product/ Employment of locals in the area   | 01-Sep-24 | 31-Aug-25 | ONGOING                         | 1,856,300          | 1,856,300.00     |
| DOST-PCAARRD Startup Grant Fund (SGF) Program   | Scaled Up Production of Charcoal Briquettes from Agro-Forest Wastes Using the DOST-FPRDI Hydraulic Charcoal Briquetter                             | Poverty reduction and empowerment of the poor and vulnerable              | Super Ulting Charcoal Briquettes (Thega Coconut Farm), backed by the Charcoal Briquetting Technology of the Forest Products Research and Development Institute (FPRDI), was founded in 2019 to produce charcoal that is eco-friendly and sustainable. Made from 100% scrap wood (mainly coconut shells) and with better product qualities compared to traditional sawing, the product, albeit its current limited reach, has seen steady and increasing patronage since June 2021 via online selling platforms (Lazada, Shopee, Facebook Marketplace) and was awarded with five (5) medals in select Ayala Malls in Metro Manila through its eAknagang Ayala Land Program for MSMEs with strong socio-economic thrusts and agenda.<br>   | Publication/One (1) Video Infomercial (published in Facebook) about the destruction brought about by the Rains System in Charcoal Production and the advantages of using charcoal briquettes as a more sustainable/Three (3) brochures and leaflets about the company and its environmental advocacy of Gaseous our forests - one briquette at a time/Patent/ IEC materials to be filed for copyright/ Super Ulting Trademark (pending)/Products/At least 1,500,000 Super Ulting Coseal® 500g packs produced and sold in 1 year. 2, 10,000 kg of Coseal® Charcoal Briquettes produced and sold in 1 year. 3, 800 kg of Wood Charcoal Briquettes produced and sold in 1 year/People and Services/At least Five (5) Production Workers shall be trained on how to operate the briquetting facility using the new equipment/Places and Partnerships/Partnerships Partnership with at least two (2) marketing channels that shall consign/ distributor sell the briquetting products of the cooperator in Metro Manila and/or Luzon. Policy/Adoption of an operations manual for the use and operation of the newly developed FPRDI briquetting equipment.  | THEGA COCONUT FARM                            | 1. Local community of Brgy. Nagsaulay San Juan Batangas and nearby areas.2. Suppliers and Coconut workers.3. Cogra workers.4. Senior Citizens, Housewives, Single Parents and Out-of-School-Youths (we currently commission ALL of our packing requirements OFF-SITE to provide job opportunities in our own community)                    | 01-Sep-24 | 31-Aug-25 | ONGOING                         | 1,801,600          | 1,801,600.00     |
| DOST-PCAARRD Startup Grant Fund (SGF) Program   | Scale-up Production of Healthy Bite as Industry Standard Nutri Snack Venture   | Rapid, inclusive and sustained economic growth                            | HEALTHYBITE FOOD PROCESSING AND PRESERVING is a plant based snacking startup company based in the island province of Guimaras. It aims to promote nutritious food snacks with vegetable and fruit bearing trees as base ingredients. Healthy Bite envisions to revolutionize the snack food industry by introducing and popularizing agri-based food carts as a preferred light meal for snackers of all ages. Healthy Bite offers a variety of preservative free snacks highly made of vegetables and edible plant materials.   | Publication/1 Production and Operational Plan/1,000 brochures FB page for promotion and social media presence/Plant/1 Logo Trademark/Products/1 CR for 5 products 1 FDA Certificate/40,000 packs of mixed chips produced and sold/40,000 packs of mixed chips produced and sold/24,000 packs of laswa chips produced and sold/7,200 packs of quick-cook veggie soup produced and sold/People: Places and Partnerships/2 partnership agreements forged with market channels (Bata forays and Babal Lokat). At least 2 partnership agreements forged with ARBs and local farmer cooperative/Policy/1 Production and Operational Plan  | HEALTHYBITE FOOD PROCESSING AND PRESERVING    | Agriarian Reform beneficiaries (as suppliers of raw materials)   | 01-Sep-24 | 31-Aug-25 | ONGOING                         | 1,992,500          | 1,992,500.00     |
| DOST-PCAARRD Startup Grant Fund (SGF) Program   | Upscaling and Upcycling Milkfish Processed Products  | Rapid, inclusive and sustained economic growth                            | Milkfish production in Region 1 offers business opportunities using fish processing technologies as key to prolong shelf-life, widen its market, and sustain food sufficiency. One of the newly established small-scale processing facilities in Pangasinan is ELDICA Seafood Processing, a business enterprise engaged in producing and processing the primary aquaculture commodity, Milkfish.   | Publication/1 business plan for processed milkfish products developed/At least 2 IEC for milkfish production and processing/Developed 1 promotional video for advertising using social chain of processed milkfish production/Developed 1 module for the upcycling of milkfish waste by-products established/Patent/At least 5 Utility Models filed/At least 3 copyrights filed/Products/At least 5 technologies of processed milkfish products are developed/People: At least 5 processed milkfish products will have a Certificate of Product Registration/An average of 500packs/month of processed milkfish products are sold in the local market/At least 1 Formulated Feed/Supplemental Diet for Milkfish Developed/People and Services/At least 10 regular jobs will be employed/At least 3 capability training programs conducted/1 food processing facility established with FDA Certification/People: At least 2 Promotional activities and participating in photo/video/webinars events conducted/Places and Partnerships/At least 5 potential local dealers and/or distributors identified/At least 1 local dealer/supplier/distributor agreement signed/At least 5 regular suppliers of raw materials established/People: Policy/HACCP Certification implemented/People: FDA Registration/Certification  | ELDICA Seafood Processing                     | Skilled workers (women deboners) of the processing facility, farm workers, and support staff Suppliers of raw materials (fresh ingredients)  | 01-Sep-24 | 31-Aug-25 | ONGOING                         | 1,821,000          | 1,821,000.00     |
| Extending the reach and impact of the LIFE model in improving livelihoods and building peace in conflict-vulnerable communities in Mindanao | Project 1. Contributing to Peacebuilding through the LIFE Model in MILF Communities of Zamboanga Sibugay, South Cotabato and Maguindanao del Norte | Integrity of the environment and climate change adaptation and mitigation | Across eight years and 26 pilot sites, the LIFE (Livelihood Improvement through Facilitated Extension) Model has consistently demonstrated its ability to rapidly improve farmer economic and social livelihoods as well as building much stronger local institutional partnerships. Developed in 2013 by the ACAR Mindanao Agricultural Extension Project and further adopted and validated by the PCAARRD-LUP-Mindanao/Land-use/LIFE (PULL) program in 2017, the Model is the only agro-extension model specifically developed for conflict-vulnerable areas of Mindanao. Given its success, there is now an opportunity to validate its impact more broadly in particular conflict settings. The project specifically identified MILF communities in Zamboanga Sibugay, Maguindanao and South Cotabato, where there is potential to have significant impact in assisting the joint livelihood-improvement/poverty reduction and peace-building process for combatants returning to civilian life. | Y1 - Products/Three (3) demo farms established in 3 sites/Y1 - People and Services/Three (3) farmer groups organized/At least one (1) cross-vill conducted/Y1 - Publications/Two (2) journal articles (working papers)/Y1 - Places and Partnerships/Three (3) MOAs drafted/Y1 - Policies/At least one (1) stakeholder's meeting initiated to discuss potential policies/sustainability mechanisms/Y1 - Patents/NAY1 - Social Impact/improved participation in community/increased participation of women and youth/Y1 - Economic Impact/diversified livelihoods and improved food security/Y2 - Products/Three (3) demo farms established in three (3) new sites/ Y2 - People and Services/Three (3) farmer groups registered/At least three (3) capacity building activities conducted/ten (10) Farmers learned about the LIFE model/light (B) Filipinos shared their experiences in learning using the LIFE model by FI partners/Y2 - Publications/One (1) journal article submitted to an international refereed journal/ One (1) video produced/ Y2 - Places and Partnerships/Three (3) MOAs signed/Y2 - Patents/NAY2 - Policies/Two (2) ordinances/resolutions passed/Y2 - Social Impact/improved participation in community/increased participation of women and youth/Y2 - Economic Impact/diversified livelihoods and improved food security/ Y3 - Products/One (1) People and Services/Three (3) farmer groups registered/ Y3 - Publications/One (1) journal article submitted to an international refereed journal/ Y3 - Places and Partnerships/Three (3) MOAs signed/ Y3 - Policies/Two (2) ordinances/resolutions passed/ Y3 - Patents/NAY3 - Social Impact/improved participation in community/increased participation of women and youth/Y3 - Economic Impact/diversified livelihoods and improved food security | University of the Philippines Mindanao (UPMn) | 1. The project's target beneficiaries are the farmers in MILF communities specifically the following: Maguindanao: Barangay Banaba in Datu Abdullah Sangki; Barangay Kamali in Ampatuan/South Cotabato: Barangay Little Baguio and Barangay Sepaka in Surallah; Zamboanga Sibugay: Barangay San Pedro and Barangay Santo Nizo in Tungawan. | 01-Aug-23 | 31-Jul-26 | ONGOING                         | 15,631,206         | 3,149,588.00     |
| Extending the reach and impact of the LIFE model in improving livelihoods and building peace in conflict-vulnerable communities in Mindanao | Project 2. Expanding the LIFE model to UP Mindanao's Land Reservation in Laak, Davao del Oro   | Integrity of the environment and climate change adaptation and mitigation | Across eight years and 26 pilot sites, the LIFE (Livelihood Improvement through Facilitated Extension) Model has consistently demonstrated its ability to rapidly improve farmer economic and social livelihoods as well as building much stronger local institutional partnerships. Developed in 2013 by the ACAR Mindanao Agricultural Extension Project and further adopted and validated by the PCAARRD-LUP-Mindanao/Land-use/LIFE (PULL) program in 2017, the Model is the only agro-extension model specifically developed for conflict-vulnerable areas of Mindanao. Given its success, there is now an opportunity to validate its impact more broadly in particular conflict settings. The project specifically identified UP Mindanao's Land Reservation Area in Davao del Oro, where there is potential to address conflict over land and the influence of the New People's Army.   | Y1 - Products/At least one (1) demo farm established/ Y1 - People and Services/One (1) farmer group organized/ One (1) cross-vill conducted/ Y1 - Publications/One (1) journal article working paper/ Y1 - Places and Partnerships/One (1) MOA drafted/ Y1 - Policies/At least one (1) stakeholder's meeting initiated to discuss potential policies/sustainability mechanisms/ Y1 - Patents/NAY1 - Social Impact/improved social capital/ Empowered women and youth participating in community activities/ Y1 - Economic Impact/ Stable and diverse livelihoods/ Food and poverty threshold reached and exceeded/ Y2 - Products/One (1) People and Services/One (1) farmer group registered/ At least three (3) capacity building activities conducted/ Y2 - Publications/One (1) journal article submitted to an international refereed journal/ Y2 - Places and Partnerships/One (1) MOA signed/ Y2 - Policies/One (1) ordinance/resolution passed/ Y2 - Patents/NAY2 - Social Impact/improved social capital/ Empowered women and youth participating in community activities/ Y2 - Economic Impact/ Stable and diverse livelihoods/ Food and poverty threshold reached and exceeded/ Y3 - Products/One (1) People and Services/One (1) farmer group organized/ At least three (3) capacity building activities conducted in the new site/ Y3 - Publications/One (1) journal article ready for submission to an international refereed journal/ Y3 - Places and Partnerships/ Two (2) MOAs drafted/ Y3 - Policies/One (1) ordinance/resolution passed/ Y3 - Patents/NAY3 - Social Impact/improved social capital/ Empowered women and youth participating in community activities/ Y3 - Economic Impact/ Stable and diverse livelihoods/ Food and poverty threshold reached and exceeded                                    | University of the Philippines Mindanao (UPMn) | The target beneficiaries of the project are the Tale Farmer's Association or a newly formed farmer's group located in Laak, Davao del Oro.   | 01-Aug-23 | 31-Jul-26 | ONGOING                         | 8,075,810          | 1,409,266.00     |









| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---|---|---|--|---|--|---|-----------|-----------|----------------------------------|--------------------|------------------|
| Regional Agri-Aqua Innovation System Enhancement (RAISE) Program in Central Luzon | Project 1A. Enhancement of the Intellectual Property and Technology Business Management (IPTBM) in Central Luzon State University (CLSU) through the RAISE Program        | Integrity of the environment and climate change adaptation and mitigation | The Central Luzon State University (CLSU) as a higher education institution (HEI) was tasked to develop quality human resources, research and technologies for people empowerment, global competitiveness and sustainable development. These creators and inventors should be available for public use in accordance with CLSU's mandate to transfer and disseminate appropriate technologies generated by its faculty, researchers and other technical staff. Identifying and managing the Intellectual Properties and commercialization of generated technologies of CLSU is a work in progress that requires strengthened and unified efforts to improve IP management and hasten technology transfer and commercialization. The IPTBM Office of CLSU was then created as one of the support mechanisms of the University to conduct prior art search on IP databases worldwide and assess the patentability of research and development projects being conducted by the university. It shall also provide technical support in the preparation and submission of patent application and post documentation requirements, drafting of responses to the formality and substantive examination reports from the Intellectual Property Office of the Philippines (IPOPHL), and conduct IP related training. In addition, management of the IP's and commercialization of generated technologies of CLSU is a work in progress that requires strengthened and unified efforts to improve IP management and hasten technology transfer and commercialization. However, the IPTBM at present lacks facilities and additional staff who are capable of conducting IP-related activities and management of CLSU's generated technologies.   | Publication:<br>5 IEC<br>Patent:<br>10 IP applications<br>3 Copyrights of IEC<br>Product:<br>5 prior art search reports<br>1 updated IP inventory<br>1 inventory of matured technologies<br>1 inventory of knowledge resources<br>1 communication plan<br>1 technology pitched<br>People:<br>2 IP-TBM staff attended Prior Art Search & IP Audit Workshop<br>2 IP-TBM staff trained in IP MasterClass<br>2 IP-TBM staff trained in Agribusiness<br>2 IP-TBM staff trained in TCMS<br>2 IP-TBM staff trained in Tech Promotion Mentorship<br>2 IP-TBM staff attend Communication Plan Workshop<br>Place:<br>1 commitment letter<br>1 partnership agreement with business/ trade institution<br>1 commercialization agreement<br>Policy:<br>Participate to content build-up of RTMS<br>Full implementation of IP policy and technology transfer protocol (with internal memos, AOs)   | Central Luzon State University (CLSU)        | Target Beneficiaries:<br>The project is intended for the stakeholders, technology generators and takers, and other makers involved. Specifically, the project directly and indirectly benefits the following:<br><br>CLSU-IPTBM personnel<br>CLSU researchers, technology generators, and other makers<br>Technology generators and other makers of CLSU<br>IP-TB R&D partners and the private sector | 01-Oct-23 | 30-Sep-25 | ONGOING                          | 2,601,600          | 1,340,800.00     |
| Regional Agri-Aqua Innovation System Enhancement (RAISE) Program in Central Luzon | Project 1B. Enhancement of the Intellectual Property and Technology Business Management (IPTBM) in Philippine Rice Research Institute (PhIRice) through the RAISE Program | Integrity of the environment and climate change adaptation and mitigation | The Intellectual Property and Technology Business Management (IPTBM) Office of the Philippine Rice Research Institute is the main office in charge of protecting and licensing PhIRice generated technologies. This Office was established in 2017 and strengthened through the DOST-PCAARRD project on Strengthening Technology Commercialization of PhIRice. Since then, the Institute "through the assistance of IPTBM office" has been able to apply several PhIRice technologies and other relevant works for IP protection, and held a number of training sessions in the basics of IP, patent search and drafting, copyright, and technology commercialization. The goal of the present project, hence, is to enhance the existing IPTBM at PhIRice to intensify the IP and technology commercialization activities in response to current development needs like the Rice Competitiveness Enhancement Fund (RCEF) under RA 11203. Several PhIRice-developed machines were earmarked by the RCEF Program Management Office at PhilRice for use in farmer's field, hence the increasing manufacturer's interest in licensing these technologies. While it is envisioned that the IPTBM office of PhIRice will eventually be run by funds collected from royalties and upfront fees, the fact remains that the existing licensees were hit hard by the Covid pandemic and the current budget is not enough for optimally functioning IPTBM office. The project is focused on the conduct of trainings, mentoring of PhIRice researchers and technology transfer officers with hopes of introducing policies for better innovation, and facilitation of IP applications and commercialization.   | Publication: 5 IECs for IP-TBM awareness and PHILRICE technologies-Patent - 10 IP Applications<br>1 IP inventors<br>1 Copyright of IECs Product - 10 Prior art search reports<br>1 IP inventors<br>1 inventory of matured technologies<br>1 inventory of knowledge resources<br>1 communication plan<br>1 technology with pre-con reports<br>2 technologies pitched<br>People:<br>1 Technology Commercialized<br>2 PHILRICE staff attended Prior Art Search & IP Workshop<br>2 PHILRICE staff trained in IP Master-Class<br>2 PHILRICE staff trained in Agribusiness MasterClass<br>2 PHILRICE staff trained in TCMS<br>2 PHILRICE staff trained in Tech Promotion Mentorship<br>2 PHILRICE staff attend Communication Plan Workshop<br>1 Participate to content build-up of RTMS/Place - 1 Commitment Letter<br>1 partnership agreement w/Business/Trade Institutions<br>1 Commercialization Agreement/Policy - Full implementation of IP policy and technology transfer protocol (with internal memos, AOs)   | Philippine Rice Research Institute (PhIRice) | The project is intended for the stakeholders, technology generators and takers, and even PhIRice inventors. Specifically, the project directly and indirectly benefits the following:<br><br>PhIRice IP-TBM personnel<br>PhIRice researchers, technology generators, and other makers<br>R&D partners and the private sector  | 01-Oct-23 | 30-Sep-25 | ONGOING                          | 2,500,000          | 1,205,000.00     |
| Regional Agri-Aqua Innovation System Enhancement (RAISE) Program in Central Luzon | Project 1C. Enhancement of the Intellectual Property and Technology Business Management (IPTBM) in Bataan Peninsula State University (BPSU) through the RAISE Program     | Integrity of the environment and climate change adaptation and mitigation | The Bataan Peninsula State University worked on the establishment of the IP-TBM Office to serve as an arm of the university towards supporting the technologies developed through research and was approved by the Board of Regents on July 16, 2020. IP management is an important issue for the competitiveness of technology-based products, processes, and services and a difficult issue due to the availability of resources to develop technologies with commercial potential to address the needs of the community and the industry. The enhanced IP-TBM Office envisions a successful technology transfer for various innovations and technologies produced by the university through efficient IP management, and technology commercialization. Furthermore, it envisions becoming a service provider for IP Management and technology commercialization in the region through various IP training and mentoring on IP management and commercialization.   | Publication:<br>5 IECs<br>Patent:<br>10 IP applications (5 patents /5 UMAs)<br>5 Copyrights (IECs)<br>Product:<br>10 PAS Reports<br>1 IP inventory updated<br>1 Patent Mining Report (Cashew)<br>2 technologies pitched<br>1 Tech Com plan developed and implemented<br>1 Technology commercialized<br>1 Sustainability plan.<br>People:<br>2 CM staff trained in national IPAC<br>At least 2 IP-TBM Staff (planilla) extensively trained in Patent Mining<br>2 CM staff trained in national ABMC<br>1 technology taker adopter<br>2 CM Staff trained in national TCMS<br>2 CM Staff trained in national TPMS<br>2 IP-TBM Staff trained on IP Audit/inventory<br>Participation in the Updating of RAISE RTMS<br>Places and Partnerships:<br>1 Commitment letter for the national trainings<br>1 partnership agreement with Business Groups/ Marketing or Trade Institutions<br>1 commercialization agreement executed<br>Policy:<br>Full implementation of IP policy (with internal memos, AOs)   | Bataan Peninsula State University (BPSU)     | Target Beneficiaries:<br>BPSU IP-TBM Office<br>Technology transfer officers and staff<br>BPSU Faculty and student researchers/inventors<br>Community stakeholders<br>External agencies (other universities, MSMEs, LGUs)  | 01-Oct-23 | 30-Sep-25 | ONGOING                          | 2,495,800          | 1,210,300.00     |
| Regional Agri-Aqua Innovation System Enhancement (RAISE) Program in Central Luzon | Project 1D. Enhancement of the Intellectual Property Technology Business Management (IPTBM) in Philippine Carabao Center (PCC) through the RAISE Program                  | Integrity of the environment and climate change adaptation and mitigation | The Philippine Carabao Center as an attached agency of the Department of Agriculture, created by virtue of Republic Act 7307 in 1992, actively upholds its commitment to conserve, propagate and promote water buffalo. In 2008, PCC was given an additional mandate to cater other livestock species as the national lead agency in livestock biotechnology research and development, by the virtue of DA Administrative Order No. 8, Series of 2008. With this, several researches have been carried out and are being conducted which covers a wide area of discipline including and not limited to breeding and genetics, reproductive biotechnology and physiology, animal health, nutrition and forage/pasture, product development and socio-economics. By this action, the Agency also adheres to the policies and principles as specifically set in the Technology Transfer Act (P10050) and acknowledges that the successful transfer of funded R&D results depends on the efficient management of intellectual property management gearing towards commercialization. This is precisely the reason why the Philippine Carabao Center aims to continue the operations of its Intellectual Property Technology Business Management Office through a component project titled, subproject 1-D: Enhancement of the Intellectual Property and Technology Business Management (IPTBM) in PCC through the RAISE Program under the project titled, subproject 1: Regional Intellectual Property and Technology Business Management (IPTBM) in Central Luzon through the RAISE program. The project will be implemented under the umbrella program, on Regional Agri-Aqua Innovation Enhancement System (RAISE) - Bate 2 in Central Luzon. This component project of the Consortium for PCC as funded by DOST-PCAARRD aims to strengthen and intensify technology promotion and commercialization activities and enhance linkages and partnerships with various consortium member institutions in Central Luzon. | Publication<br>9 Information Education and Communication (IEC) materials<br>Patent:<br>10 IP applications (UM & Patent only)<br>5 Copyright applications (IECs) filed<br>Product:<br>10 Prior-Art Search (PAS) Reports<br>1 IP inventory of matured technologies<br>1 Inventory of knowledge resources prepared and updated<br>1 communication plan developed & implemented<br>1 Tech Complan developed & implemented<br>1 technology with pre-commercialization reports<br>2 technologies pitched<br>1 Technology commercialized<br>People & Services<br>2 PCC staff attended in regional IP Audit & inventory Workshop<br>2 PCC staff trained in national IP Masterclass<br>2 PCC staff trained in national Agribusiness Masterclass<br>2 PCC staff trained in national Technology Commercialization Mentorship Series (TCMS)<br>2 PCC staff trained in national Technology Promotion Mentorship<br>2 PCC staff attend reg'nl Commercialization Plan Workshop<br>2 PCC staff attend reg'nl IP Policy/ Tech Trans protocol review<br>1 institutional echo seminar conducted<br>Trained 10 staff on echo seminars<br>Participate to content build-up of RTMS<br>Participate to content build-up of RTMS | Philippine Carabao Center (PCC)              | Target Beneficiaries:<br>1. PCC researchers<br>2. Farmers & Dairy cooperatives<br>3. Private entities<br>4. Other consortium member institutions<br>5. AANR stakeholders from the academe, public, and private sectors, non-government organizations (NGOs), and international partners<br><br>6. Potential entrepreneurs   | 01-Oct-23 | 30-Sep-25 | ONGOING                          | 4,202,908          | 2,315,272.00     |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---|--|---|---|---|---|--|-----------|-----------|----------------------------------|--------------------|------------------|
| Regional Agri-Aqua Innovation System Enhancement (RAISE) Program in Central Luzon | Project 1E. Enhancement of the Intellectual Property Technology Business Management (IPTBM) in Philippine Center for Postharvest Development and Mechanization (PHiMech) through the RAISE Program | Integrity of the environment and climate change adaptation and mitigation | Being a research and development institution, PHiMech is mandated not only to generate, extend, and commercialized problem-oriented agriculture and fishery postharvest and mechanization technologies but to generate a high-quality innovative technologies, processes, systems and products to be able to contribute to national progress and development. It must be noted, however, not only by concerned PHiMech stakeholders but by every research and academic institution as well, that development does not simply start with R&D and end with technology generation but extend further into technology transfer and actual utilization * all through commercialization.  | Publication: 5 IECs/Patent: 10 IP applications, Copyright of training report<br>Product: 10 Prior Art Search (PAS) Reports 1 IP inventory 1 Inventory of matured technologies 1 Inventory of knowledge resources 1 communication plan 1 technology with pre-comm reports 2 technologies pitched 1 technology commercialized<br>People: 2 Prior art Search & IP Audit Workshop 2 IP Masterclass, 2 Agribusiness Masterclass 2 Technology Commercialization Mentorship Series 2 Tech Promotion Mentorship 2 CommPlan Workshop<br>Place: 1 commitment letter 1 partnership agreement w/ Business/Trade Institutions<br>Policy: 1 Commercialization Agreements<br>Full implementation of IP policy and technology transfer protocol (with internal memos, AOs)  | Philippine Center for Postharvest Development and Mechanization (PHiMech) | The project is intended for the stakeholders, technology generators and takers, and other makers of PHiMech and CMIs involved. Specifically, the project directly and indirectly benefits the following:<br><br>PHiMech IP-TBM personnel<br>PHiMech researchers, technology generators, and other makers<br>IP-TBM Personnel of CMIs involved<br>Technology generators and other makers of participating CMIs<br>R&D partners and the private sector | 01-Oct-23 | 30-Sep-25 | ONGOING                          | 2,307,800          | 1,076,700.00     |
| Regional Agri-Aqua Innovation System Enhancement (RAISE) Program in Central Luzon | Project 1F. Establishment of the Intellectual Property Technology Business Management (IPTBM) in Tarlac Agricultural University (TAU) through the RAISE Program                                    | Integrity of the environment and climate change adaptation and mitigation | Over the years, the Tarlac Agricultural University (TAU) has strongly engaged in research and development, which has generated several matured technologies from its flagship commodities such as sweetpotato, bamboo, free-range chicken, and kamlong. Some of these technologies have been award winning and have been showcased in the international trade fairs and exhibits. TAU's innovative technologies like sweetpotato clean planting materials and value-added food products, free-range chickens, e-bamboo, and kamlong were adopted by local farmers, women groups, cooperatives, entrepreneurs, and even farmers abroad. There are also innovative and transformative technologies that have been developed by the Department of Food Science, Biosystems Engineering, and Veterinary Medicine, which await IP protection and an opportunity to be commercialized. Numerous business implements of the graduates of the BS Entrepreneurship have been set up and evaluated. However, the majority landed on empty shelves and dreams.   | Publication: 3 IECs/patent/Patent: 5 IP applications, 5 IECs (copyrights)<br>Product: 5 PAS Reports 1 IP inventory 1 Inventory of matured technologies 1 Inventory of knowledge resources 1 communication plan 1 technology with pre-comm reports 1 technology pitched 1 technology commercialized<br>People: 2 CM staff trained in national IPMC 2 CM staff trained in national ABAC 2 CM staff trained in national TCMS 2 CM staff trained in national IPMS 2 CM staff attended reg-1) IP Audit and Inventory Workshop 2 CM staff attended reg-1) IP Policy/Tech Trans Protocol Review 2 CM staff attended reg-1) CommPlan Workshop<br>Institutional Ethic Seminar conducted<br>Trained at least 10 staff on echo seminars<br>2 CM Staff participated in content build-up of RTMS<br>Place: 1 Commitment Letter for national trainings 1 Partnership agreement with Business/Trade Institutions<br>Policy: 1 Commercialization Agreement<br>Crafting/enhancement of IP Policy<br>Drafting/enhancement of technology transfer protocol | Tarlac Agricultural University (TAU)                                      | TAU IP-TBM personnel<br>TAU researchers, technology generators, and other makers<br>Technology generators/owners<br>R&D partners and the private sector<br>Sweetpotato, free range chicken, Kamlong, and Bamboo R&D and industry<br>Students<br>Faculty<br>Researchers<br>Entrepreneurs<br>Start-Ups SMEs  | 01-Oct-23 | 30-Sep-25 | ONGOING                          | 2,647,520          | 1,366,260.00     |
| Regional Agri-Aqua Innovation System Enhancement (RAISE) Program in Central Luzon | Project 1G. Establishment of the Intellectual Property and Technology Business Management (IPTBM) in President Ramon Magsaysay State University (PRMSU) through the RAISE Program                  | Integrity of the environment and climate change adaptation and mitigation | It is the mandate of President Ramon Magsaysay State University to continuously develop R&amp;D technologies through the creation of new knowledge, transfer, and disseminate these innovations to clients, and support local and global development. Four (4) of the seven campuses that make up the PRMSU's satellite campuses are involved in developing new technologies for agriculture and aquatic resources. The organization manages IP-related activities through an Intellectual Property Unit that is run by three functional staff members. The PRMSU produced 95 ANRR projects in 2021, including 30 papers for copyrights, 15 projects with the potential for patentability, and 5 projects with soft innovations. Through the RAISE Program, the project seeks to establish an institutional IPTBM in PRMSU, Zambales to step up IP and commercialization efforts among the region's partner organizations and local communities. The project's main goals are to increase participation in training, carry it out, provide internal mentoring for the institution's IPTBM developers and creators, standardize and harmonize IP policies, create an institutional IP inventory, and strengthen relationships between agencies to further IPTBM-related endeavors. | Publication: IEC Material: Institutional training report<br>Patent: IP Application<br>Copyright<br>Product: Prior Art Search<br>Communication plan<br>Technology pitched<br>Institutional inventory of matured technologies<br>Inventory of knowledge resources<br>Technology with pre-commercialization report<br>technology commercialized<br>People and Services<br>Staff attended the prior art search and IP audit workshop<br>Staff trained in IP Master class<br>Staff trained in the Agribusiness master class<br>Staff trained in TCMS<br>Staff trained in technology promotion mentorship<br>Staff attend the commercialization plan workshop<br>Participate in the content build-up of RTMS<br>Place and Partnerships<br>Coordinated/Managed IP-TBM operation with the four ANRR operating campuses<br>Commitment letter<br>partnership agreement with business/ trade institutions<br>Commercialization agreement<br>Policy: Implementation of IP policy and technology transfer guidelines of the institution              | President Ramon Magsaysay State University (PRMSU)                        | The project is intended for the stakeholders, technology generators and takers, and other makers of PRMSU involved. Specifically, the project directly and indirectly benefits the following:<br><br>PRMSU IP-TBM personnel<br>PRMSU researchers, technology generators, and other makers<br>IP-TBM Personnel involved<br>Technology generators and other makers of PRMSU<br>R&D partners and the private sector                                     | 01-Oct-23 | 30-Sep-25 | ONGOING                          | 2,666,320          | 1,307,460.00     |
| Regional Agri-Aqua Innovation System Enhancement (RAISE) Program in Central Luzon | Project 1H. Establishment of the Intellectual Property and Technology Business Management (IPTBM) in Bulacan Agricultural State College (BASC) through the RAISE Program                           | Integrity of the environment and climate change adaptation and mitigation | This project will initially focus on the capacitating the personnel to be assigned to the BASC IPTBM, generation and enhancement of a Board of Trustees (BOT) approved IP Policy and Technology Transfer Protocol, generation and maintenance of the IP Inventory and Sex-Disaggregated Data of IP generators, and establishment of linkages to improve IPTBM activities. The BASC IPTBM will then extend to services to the BASC constituents by promoting a culture of equitable IP protection and technology commercialization at BASC through information dissemination, echo seminars, packaging and submission of IP application, and overall assistance to technology commercialization of BASC Mature Technologies All of which will lead to a sustainable gender-responsive BASC IPTBM office incorporated to the organic structure of BASC.   | Publication: 3 IECs -Gender Responsive Information, Education and Communication materials/Patent: 5 IP Applications 1 Copyright of Gender Responsive IECs/Product: 5 PAS 1 IP inventory with SDO of IP generators 1 Inventory of matured technology 1 Communication plan 1 Technology with pre-comm reports 2 Technologies pitched 1 Technology Commercialized/People: 2 Staff attended Prior Art Search & IP Audit Workshop 2 Staff trained in IP Masterclass 2 Staff trained in Agribusiness Masterclass 2 Staff trained in TCMS 2 Staff trained in TechPromotion Mentorship 2 Staff attended CommPlan Workshop 2 Participate to content build-up of RTMS/Place: 1 Commitment Letter 1 Partnership agreement with Business/Trade Institutions 1 Commercialization Agreement/Policy: Full implementation of BOT-approved equitable IP policy and technology transfer protocol (with internal memos, AOs)   | Bulacan Agricultural State College (BASC)                                 | BASC IP-TBM Personnel<br>BASC stakeholders: researchers and extensionists, technology generators and makers; and Group or individuals involved in rabby.   | 01-Oct-23 | 30-Sep-25 | ONGOING                          | 2,607,000          | 1,251,000.00     |
| Regional Agri-Aqua Innovation System Enhancement (RAISE) Program in Central Luzon | Project 1I. Establishment of the Intellectual Property and Technology Business Management (IPTBM) in Aurora State College of Technology (ASCOT) through the RAISE Program                          | Integrity of the environment and climate change adaptation and mitigation | The establishment of IPTBM Office in Aurora State College of Technology will serve as the main office incharge of all the technologies generated by the College. The goal of the project is to assist the researchers and investors in patent application, enhancement, and commercialization of products. The project focuses on the establishing of an Intellectual Property office that will identify and protect the intellectual property of ASCOT researchers and inventors; mentoring and capacitating the technology transfer officers of ASCOT; identifying and protecting the Intellectual Property Rights of the College to promote and embed quality, integrity and novelty in research and other scholarly works; and establishing linkage with different agencies for the commercialization of matured technology of ASCOT.   | Publication: 3 IECs/Patent: 5 IP application/Product: 5 prior art search 1 IP inventory 1 Inventory of matured technologies 1 Inventory of knowledge resources 1 communication plan 1 technology with pre-comm reports 2 technologies pitched 1 technology commercialized/People: 2 CM staff attended Prior Art Search and IP Audit Workshop 2 CM staff trained in IP MasterClass 2 CM staff trained in Agribusiness MasterClass 2 CM staff trained in TCMS 2 CM staff trained in TechPromotion Mentorship 2 CM staff attend CommPlan Workshop/Place: 1 commitment letter 1 partnership agreement with business/trade institutions 1 commercialization agreement/Policy: Full implementation of IP and technology transfer protocol (with internal memos, AOs)  | Aurora State College of Technology (ASCOT)                                | ASCOT, faculty, staff and student researchers, technology creator, and other makers, and R&D partners and private sector   | 01-Oct-23 | 30-Sep-25 | ONGOING                          | 2,650,800          | 1,297,800.00     |

| 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, 2024 | Total Project Cost | 2024 PCAARRD GIA |
|---|---|---|---|---|--|--|-----------|-----------|---------------------------------|--------------------|------------------|
| Regional Agri-Aqua Innovation System Enhancement (RAISE) Program in Central Luzon | Project 1J. Establishment of the Intellectual Property and Technology Business Management (IPTBM) in Department of Agriculture Regional Field Office III (DA RFO III) through the RAISE Program | Integrity of the environment and climate change adaptation and mitigation | The Department of Agriculture RFO III is a government agency charged with the promotion of agricultural development in the region with a vision of a food secure Philippines with prosperous farmers and fisher folks. The mission of the agency is to empower its stakeholders, increase productivity and profitability, being mindful of sustainability and resilience. To ensure that technology transfer and commercialization will be a success, and that intellectual property rights is given due importance, there is a need for the establishment of the IPTBM of the Department of Agriculture RFO III.   | <p>Publication</p> <ul style="list-style-type: none"> <li>3 IECs</li> <li>Patent</li> <li>5 IP Applications</li> <li>3 IEC copyright</li> </ul> <p>Product</p> <ul style="list-style-type: none"> <li>5 PAS reports</li> <li>1 IP a technologies inventory updated</li> <li>1 inventory of knowledge resources prepared and updated</li> <li>1 CM communication plan developed &amp; implemented</li> <li>1 Tech with pre-comm report</li> <li>2 Technologies pitched</li> <li>1 Technology Commercialized</li> </ul> <p>People and Services</p> <ul style="list-style-type: none"> <li>2 CM staff trained in National IPAC</li> <li>2 CM staff trained in National ABAC</li> <li>2 CM staff trained in National TCMS</li> <li>2 CM staff trained in National TPMS</li> <li>2 CM staff attended reg<sup>TM</sup> IP Audit &amp; Inventory Workshop</li> <li>2 CM staff attended reg<sup>TM</sup> IP Policy/Tech Trans Protocol review</li> <li>2 CM staff attended reg<sup>TM</sup> Comm Plan Workshop</li> <li>1 institutional echo seminar conducted</li> <li>Trained at least 10 staff on echo seminars</li> <li>Participate in content build-up of RTMS</li> </ul> <p>Places and Partnerships</p> <ul style="list-style-type: none"> <li>1 Commitment letter for the national trainings</li> <li>1 partnership agreement with business/trade institutions</li> <li>1 Commercialization Agreement</li> </ul>   | Department of Agriculture Regional Field Office III (DA RFO III) | Target Beneficiaries: The project is intended for the stakeholders, technology generators and takers, and other makers of DA RFO III. Specifically, the project, directly and indirectly benefits the following DA RFO III CTEB and IPTBM personnel: DA RFO III researchers, technology generators, and other makers: R&D partners and the private sector  | 01-Oct-23 | 30-Sep-25 | ONGOING                         | 2,696,600          | 1,350,800.00     |
| Regional Agri-Aqua Innovation System Enhancement (RAISE) Program in Central Luzon | Project 2 Regional Agribusiness Hub (ABH) in Central Luzon through the RAISE Program  | Integrity of the environment and climate change adaptation and mitigation | The Philippine Carabao Center at Central Luzon State University (PCC at CLSU) is one of the regional networks of the Philippine Carabao Center (PCC). PCC is an attached agency of the Department of Agriculture, created by the virtue of Republic Act 7307 or better known as the Philippine Carabao Act of 1992. PCC implements the Carabao Development Program (CDP) in the country. CDP is a continuous and organized effort to improve the genetic potential of a native carabao as a source of meat, milk, draft and hide. This is the reason why the Philippine Carabao Center advocates the continual improvement of carabao development program implementation under the project titled, "Revitalizing the Regional Agribusiness Hub in Central Luzon. The project will be implemented under the umbrella program, "Regional Agri-Aqua Innovation Enhancement System (RAISE) - Batch 2 in Central Luzon. This component project for PCC as funded by DOST-PCAARRD aims to strengthen and enhance technology promotion and commercialization activities and intercity linkages and partnerships with various consortium member institutions in Central Luzon.  | <p>Publication: 1 Regional Training Report; Patent: 1 Copyright of Training Report; Product: 1 Technology with value proposition report; business plan, Feasibility study, market study; 1 Regional Agribusiness Master Class</p> <p>1 Trained CM Staff; Place: 1 Partnership agreement with Business/Trade Institutions; Policy: 1 Regional Agribusiness Hub institutionalized</p>   | Philippine Carabao Center (PCC)                                  | Ensure the full implementation and harmonization of the agribusiness hub with participating CMIs in Central Luzon. Develop a regional agribusiness hub Policy with consortia members from Central Luzon. Full implementation of policy (with internal memo).   | 01-Oct-23 | 30-Sep-25 | ONGOING                         | 2,583,848          | 1,250,186.00     |
| Regional Agri-Aqua Innovation System Enhancement (RAISE) Program in Central Luzon | Project 3 Regional Agri-Aqua Technology Business Incubation (ATBI) in Central Luzon through the RAISE Program   | Integrity of the environment and climate change adaptation and mitigation | The CLSU ATBI will serve as one of the launching pads for ANNR start-ups or new businesses in Central Luzon. The facility will provide early-stage companies access to resources they need to function, grow, and sustain their businesses. To help preserve and enhance the RAISE program, CLSU, PSAU and IPSU will be involved in the project implementations with the end view of internalizing the ATBI operations and providing support in the transfer of technologies through capacity building, technology business incubation or co-incubation among these ATBIs including other CMIs that do not implement ATBI project. The Regional ATBI will operate in cycle wherein it shares and adopts the best practices of ATBIs within the country in general and within the region in particular and cascade the same to its partner CMIs. Through this, CMIs across the region are provided with necessary information and assistance. After two years, the RAISE Program shall have empowered ATBI operations in Region III by adopting several strategies, viz: Regional Capacity Building and Mentoring, Agri-Technology Business Development, Intellectual Property Management, Strategic Partnership and Collaboration with local and International Partners, and Enhanced Knowledge Management. | <p>Publication:</p> <ul style="list-style-type: none"> <li>2 Regional Training Reports</li> <li>1 Regional ATBI Operations Manual crafted</li> <li>1 Regional ATBI Business Plan crafted</li> <li>1 Regional ATBI Service Offering prepared</li> <li>1 Consolidated curricula of existing &amp; new ATBIs</li> <li>6 basic/advanced incubation curricula revised as needed</li> <li>6 acceleration curricula developed or improved as needed</li> <li>2 IEC or promotional material for the ATBI produced</li> <li>1 promotional video for the ATBI developed</li> <li>1 IEC or promotional materials for the incubates developed</li> <li>1 promotional videos for the incubates developed</li> <li>1 ATBI sustainability plan developed and implemented</li> <li>1 ATBI communication plan developed and implemented</li> </ul> <p>Patent:</p> <ul style="list-style-type: none"> <li>10 trademarks filed</li> <li>10 copyrights filed</li> </ul> <p>Product:</p> <ul style="list-style-type: none"> <li>3 Technology Commercialized with FOR / Facilitated the commercialization of CM technology</li> <li>1 Consolidated regional report</li> <li>2 Technologies co-incubated</li> <li>10 technologies incubated/adopted by new incubates</li> <li>6 technologies incubated/adopted by continuing incubates</li> <li>3 technologies incubated/adopted by accelerates</li> </ul> <p>People and Services</p> <ul style="list-style-type: none"> <li>10 new incubates enrolled in any of the existing ATBIs</li> <li>2 new incubates under co-incubation program</li> <li>Coordinated participation of 3 CMIs on national ATBI MC</li> <li>Coordinated participation of 3 CMIs on National TCMS</li> <li>Assisted 3 CMIs in ATBI services</li> <li>Participate in the content build-up &amp; updating of RAISE RTMS</li> </ul> | Central Luzon State University (CLSU)                            | Target Beneficiaries<br><br>Benefits from the Project<br><br>(1) State Universities and Colleges (SUCs)<br><br>(1) Empowered technology generators, and ATBI staff<br>(2) Better ATBI staffing through hiring project staffs<br>(3) Enhancement/formulation of effective incubation policies<br>(4) More inclusive and responsive ATBI services<br>(5) Increased number of ATBI clients served<br>(6) Increased number of employment generated by incubates/accelerates<br>(7) Increased number of IPs protected<br>(8) Increased number of partners/collaborators engaged in the program<br>(9) Increased number of technologies transferred and commercialized | 01-Oct-23 | 30-Sep-25 | ONGOING                         | 7,057,596          | 3,442,723.00     |
| Regional Agri-Aqua Innovation System Enhancement (RAISE) Program in Central Luzon | Project 3A. Enhancement of the Agri-Aqua Technology Business Incubator (ATBI) in Bataan Peninsula State University through the RAISE Program  | Integrity of the environment and climate change adaptation and mitigation | Bataan Peninsula State University Agri-aqua Technology Business Incubator (DOST-PCAARRD-BPSU ATBI) has contributed significant milestones in nurturing the technopreneurial ecosystem in the province through business development and technology incubation. Currently, BPSU ATBI is incubating 11 incubates that provide comprehensive training on identifying market traction and validation and technology development through the university's research and development (RD) centers. Moreover, the incubator has successfully launched its own technology business incubation framework entitled "AgriSenseo" that holistically fosters and encapsulates the functions of ATBI by providing programs and services needed by the incubates during their early stage. Recognizing this success, enhancement of the DOST-PCAARRD-BPSU ATBI will ensure the sustainability of its program from basic incubation to advancement and acceleration. The project will focus on increasing the incubates' instability through programs focusing on target market expansion, financial sourcing and networking, and further strengthening of developing market-driven and demand-driven agri-aqua technologies.   | <p>Publication: For Year 1:</p> <ul style="list-style-type: none"> <li>At least 3 IEC or promotional material for ATBI produced</li> <li>At least 1 promotional video for ATBI developed</li> <li>At least 2 IEC or promotional materials for the incubates developed</li> <li>At least 1 promotional video for the incubates developed</li> <li>At least 3 revised curricula for basic incubation</li> <li>At least 3 curricula developed for advanced incubation</li> </ul> <p>For Year 2:</p> <ul style="list-style-type: none"> <li>1 ATBI Business Plan revised as needed</li> <li>1 ATBI Operations Manual revised as needed</li> <li>At least 2 IEC or promotional material for ATBI produced</li> <li>At least 1 promotional video for ATBI developed</li> <li>At least 3 IEC or promotional materials for the incubates developed</li> </ul> <p>Patent: For Year 1:</p> <ul style="list-style-type: none"> <li>At least 1 trademarks filed</li> <li>At least 2 copyrights filed</li> </ul> <p>For Year 2:</p> <ul style="list-style-type: none"> <li>At least 2 trademarks filed</li> <li>At least 3 copyrights filed</li> </ul> <p>Product: For Year 1:</p> <ul style="list-style-type: none"> <li>At least 2 technology transferred and incubated</li> <li>At least 1 technology commercialized with issued Fairness Opinion Report</li> </ul> <p>For Year 2:</p> <ul style="list-style-type: none"> <li>At least 3 technology transferred and incubated</li> <li>At least 1 technology commercialized with issued Fairness Opinion Report</li> </ul> <p>People: For Year 1:</p>   | Bataan Peninsula State University (BPSU)                         | University-based faculty and student researchers, Local start-ups and MSMEs in Bataan Agri-aqua sector in the communities in Bataan Local cooperatives in Bataan Women in informal economy sector in Bataan Other marginalized sectors in Bataan   | 01-Oct-23 | 30-Sep-25 | ONGOING                         | 4,500,000          | 2,111,328.00     |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|---|---|---|--|--|---|---|-----------|-----------|----------------------------------|--------------------|------------------|
| Regional Agri-Aqua Innovation System Enhancement (RAISE) Program in Central Luzon   | Project 3B. Enhancement of the Agri-Aqua Technology Business Incubator in Pampanga State Agricultural University (PSAU) through the RAISE Program | Integrity of the environment and climate change adaptation and mitigation | The PSAU Agri-Aqua Technology Business Incubation (ATBI) Office is established to synergize multi-sectoral relationships among the key players of the business and start-up ecosystem, especially the micro, small and medium enterprises (MSMEs) in the sector of agriculture and aquatic with the aim to accelerate the technology transfer and commercialization of university-made technologies through technology management, enterprise development, and active partnership services. With its establishment on November 2023, the crucial initial steps for the project were to formalize operations, create awareness, acquire R&D partners and industry experts, and engage vital players in the ecosystem such as the private sector and the government were undertaken to onboard and support its clientele: the incubatees. Enhancing the PSAU-Agri-Aqua Technology Business Incubation (ATBI) project shall be instrumental for continuous operations and improvement of processes of the incubation for a more effective and efficient delivery of its services. The project shall facilitate further support to technology management, technology transfer and commercialization, and enterprise development efforts of the University and realize the socio-economic impact towards the community such as employment opportunities and enhanced business landscape in the agriculture and aquatic sectors.   | <p>Publication:</p> <ul style="list-style-type: none"> <li>1 ATBI business plan revised as needed</li> <li>1 ATBI operations manual revised as needed</li> <li>10 basic incubation curriculum revised as needed</li> <li>1 advanced incubation curriculum developed</li> <li>16 EC or promotional material for the ATBI produced</li> <li>1 promotional video for the ATBI developed</li> <li>16 EC or promotional materials for the incubatees developed</li> <li>2 promotional video for the incubatees developed</li> <li>1 ATBI sustainability plan revised as needed</li> </ul> <p>Patent:</p> <ul style="list-style-type: none"> <li>10 trademarks filed</li> <li>10 copyrights filed</li> </ul> <p>Product:</p> <ul style="list-style-type: none"> <li>10 technologies incubated/adopted by new incubatees</li> <li>6 technologies incubated/adopted by continuing incubatees</li> <li>2 technologies co-incubated</li> <li>3 technologies commercialized with issued Fairness Opinion Report</li> </ul> <p>People:</p> <ul style="list-style-type: none"> <li>10 new incubatees enrolled to the basic incubation program</li> <li>6 continuing incubatees enrolled to the advanced incubation program</li> <li>6 continuing incubatees graduated from the advanced incubation program</li> <li>6 startups/proof registered and launched</li> <li>1 benchmarking activity conducted</li> <li>6 trainings for the ATBI staff conducted or participated in</li> <li>10 trainings for the incubatees conducted</li> <li>10 business plans for the new incubatees developed</li> <li>6 business plans for the continuing incubatees improved</li> <li>4 awareness seminars or promotional activities conducted</li> <li>4 business pitching events, industry meetups, or networking events conducted or participated in</li> </ul>  | Pampanga State Agricultural University (PSAU) | PSAU ATBI Personnel<br>PSAU Researchers/Inventors and other employees<br>Agri-aqua incubatees (Entrepreneurs/Agri-preneurs, Farm Owners, Farmers)   | 01-Oct-23 | 30-Sep-25 | ONGOING                          | 4,500,000          | 2,284,947.00     |
| Regional Agri-Aqua Innovation System Enhancement (RAISE) Program in Central Luzon   | Project 4. Establishment of Regional Knowledge Management (KM) Hub in Central Luzon through the RAISE Program                                     | Integrity of the environment and climate change adaptation and mitigation | Knowledge is a critical enabling factor for Agriculture, Aquatic, and Natural Resources Sector (AANR), specifically the agri-aqua innovation system. Thus, a systemic interactions favouring innovation outcomes is greatly needed by formalizing the flow and management of information and knowledge between and among stakeholders. Moreover, since our society is becoming increasingly knowledge-based, the systematic management of intellectual capital and organizational knowledge is highly important to organizations focusing on the agri-aqua innovation system to capture and store significant data and information in a centralized or distributed electronic environment. As such, the situation calls for a more intensive efforts on mainstreaming knowledge management (KM) in Region 3. It is now high time for the consortium to conduct an inventory of knowledge resources from the different member institutions and develop a database system or a knowledge portal which will serve as a repository of knowledge products, and information on AANR. Through this project, the consortium will also be able to establish a Knowledge Café (K-Café) that will serve as a platform to bring people together where knowledge sharing and learning could take place. This project will also be utilizing traditional and digital media for technology promotion. With this, it is expected that the regional knowledge hub will be strengthened to which knowledge and learning resources and information coming from the different R&D, DA institutions, SUCs, and PLGUs in Central Luzon will be made available and accessible for public consumption. | <p>Publication:</p> <ul style="list-style-type: none"> <li>1 consortium member-agencies mentored on ATBI operations</li> <li>1 Written Training reports and published and produced knowledge products (KPs)</li> <li>1 regional training module</li> <li>1 regional training report</li> <li>10 knowledge products (brochures, booklets, apps)</li> </ul> <p>Patent:</p> <ul style="list-style-type: none"> <li>Copyrighted training modules and KPs</li> <li>11 copyright of training modules and IECs</li> </ul> <p>Product:</p> <ul style="list-style-type: none"> <li>Produced inventory of knowledge resources, prepared and implemented a communication plan, and established and maintained the e-library</li> <li>1 reg.-I inventory of knowledge resources</li> <li>1 reg.-II comp plan</li> <li>1 reg.-I e-lib established/enhanced</li> </ul> <p>People and Services</p> <ul style="list-style-type: none"> <li>1 reg.-I comp plan and inventory of knowledge resources workshops</li> <li>1 reg.-I tech promotion mentorship</li> <li>1 reg.-I pilot day</li> <li>Trained 22 (11 CMs x 2 pax) CM staff</li> <li>Assisted 11 CMs in KM services</li> <li>11 CMs participated to content build up of RTMS</li> </ul> <p>Places and Partnerships</p> <ul style="list-style-type: none"> <li>Established K-Cafes</li> <li>1 K-Café with CLAAARDEC as main hub and 6 K-Café/s in the from the SUCs</li> </ul>   | Central Luzon State University (CLSU)         | <p>Target Beneficiaries:</p> <ul style="list-style-type: none"> <li>CLAAARDEC, CLSU as base-agency</li> <li>21 Consortium Member Institutions (CMIs)</li> <li>ASCOT</li> <li>BASC</li> <li>BPSU</li> <li>NEUST</li> <li>PRMSJU</li> <li>TAU</li> <li>PLGU Aurora</li> <li>PLGU Bataan</li> <li>PLGU Bulacan</li> <li>PLGU Nueva Ecija</li> <li>PLGU Zambales</li> <li>PLGU Tarlac</li> <li>PhilRice</li> <li>PhiMech</li> <li>PCC</li> <li>DA-AT13</li> <li>DOST Region 3</li> <li>DA Region 3</li> </ul> | 01-Oct-23 | 30-Sep-25 | ONGOING                          | 2,508,800          | 1,214,400.00     |
| Regional Agri-Aqua Innovation System Enhancement (RAISE) Program in Central Luzon   | Project 5. National Agri-Aqua Technology Business Incubation (ATBI) Networking and Capacity Building through the RAISE Program                    | Integrity of the environment and climate change adaptation and mitigation | The activities of 22 Agri-Aqua Technology Business Incubators (ATBIs) comprise to create an enabling ecosystem for local innovations on a national level. Hence, continuous support must be extended to them by DOST-PCAARRD who shall likewise recognize and consider their individual strengths and needs including the uniqueness of their incubation operations. Significant amounts of public funds have been allocated by DOST-PCAARRD to the establishment of ATBIs in the country. Hence, it is imperative to ascertain that the results of investment of government resources are maximized. Complementary to the establishment of 22 Agri-Aqua TBIs across the country, the monitoring, enhancement and documentation of the current state of the ATBI ecosystem in the national landscape resulting from the implementation of the programmed activities are essential for DOST-PCAARRD to come up with a needs-based and calibrated support to these facilities.   | <p>Publication:</p> <ul style="list-style-type: none"> <li>1 training report on national ATBI MC</li> <li>1 ATBI MC of Training Module</li> <li>1 Compendium of start-off incubatees prepared</li> <li>1 coffee table book on ATBI in the Philippines developed</li> <li>1 semi-annual report and 1 annual report prepared and submitted per year</li> <li>1 terminal report prepared and submitted</li> </ul> <p>Patent:</p> <ul style="list-style-type: none"> <li>Copyright of Training Module</li> <li>At least 3 publications for copyright filed</li> </ul> <p>Product:</p> <ul style="list-style-type: none"> <li>1 Consolidated national report</li> <li>1 national ATBI master class conducted and attended by ATBI management and staff per year</li> <li>10 CMs trained/attended the national ATBI MC</li> <li>1 national conference on ATBI conducted per year; attended by all ATBIs, stakeholders and partners per year</li> <li>1 incubatees summit (with pitching activity) conducted per year; attended by incubatees/accelerates from all ATBIs, stakeholders and partners</li> <li>Assistance on crafting Regional ATBI Operations Manual</li> <li>1 pre-terminal and 1 terminal review conducted in Year 2</li> </ul> <p>People and Services</p> <ul style="list-style-type: none"> <li>Coordinate and mentoring of 25 ATBIs</li> <li>Mentoring of new ATBIs</li> <li>Coordinated participation of 20 CMs on national ATBI MC</li> <li>Assisted 20 CMs in ATBI services</li> <li>At least 2 webinars for the general public as promotion of the program conducted</li> <li>At least 2 trainings/consultation meetings with DOST ROs conducted</li> <li>At least 1 site/virtual visit to ATBIs conducted per year</li> </ul> <p>PLACES AND PARTNERSHIPS</p> <ul style="list-style-type: none"> <li>2 partnerships agreement with Business/Trade Institutions</li> </ul> | Central Luzon State University (CLSU)         | <p>Target Beneficiaries</p> <p>Target Beneficiaries</p> <p>Benefits from the Project</p> <p>(1) State Universities and Colleges (SUCs)</p> <p>(1) Enhancement/formulation of effective incubation policies</p> <p>(2) More inclusive and responsive ATBI services</p> <p>(3) Increased utilization rates of ATBI facilities, and machines and equipment</p> <p>(4) Increased number of technologies transferred and commercialized</p>  | 01-Oct-23 | 30-Sep-25 | ONGOING                          | 6,855,944          | 4,072,972.00     |
| Regional Agri-Aqua Innovation System Enhancement (RAISE) Program in Central Visayas | Project 1. Regional Intellectual Property and Technology Business Management (IPTBM) in Central Visayas through the RAISE Program                 | Integrity of the environment and climate change adaptation and mitigation | The Regional Agri-Aqua Innovation System Enhancement (RAISE) Program is a mirror-image of the DPTIC in the Regions. It serves as a one-stop-information service shop and convergence hub for technology generators and users. A platform to package, promote, and commercialize S&T creations to enhance the innovators ecosystem in the AANR sector. The program is centered on Intellectual Property (IP) and technology transfer mechanisms. The program has four (4) project components: Project 1. Regional Intellectual Property and Technology Business Management (IPTBM) in Central Visayas through the RAISE Program focuses on IP management and technology commercialization; Project 2. Establishment of Regional Agri-Business Hub (ABH) in Central Visayas through the RAISE program focuses on agribusiness enterprise management; Project 3. Regional Agri-Aqua Technology Business Incubator (ATBI) in Central Visayas through the RAISE program which centers on technology inventory, assessment, valuation, and its process to commercialization; and Project 4. Establishment of Regional Knowledge Management (KM) Hub in Central Visayas through the RAISE program which will spearhead the knowledge management activities and technology promotion of all Consortium Member Institutions (CMIs). The RAISE Program in Region VII involves 10 CMIs of the Central Visayas Agriculture, Aquatic and Natural Resources Research and Development Consortium (CVAARDEC). The program will implement a mentor-mentee-regional approach to further enhance the innovation ecosystem in the agriculture, aquatic, and natural resources sectors.             | <p>PUBLICATION:</p> <ul style="list-style-type: none"> <li>1 Regional Training Reports (1 consolidated training report of all the CM participants who attended to Intellectual Property Master Class (IPMC); 1 training report on regional IP Audit &amp; Inventory Workshop; 1 training report on regional echo IPMC)</li> </ul> <p>PRODUCT:</p> <ul style="list-style-type: none"> <li>1 Regional list of Priority R&amp;D commodity prepared and updated</li> <li>1 Regional technology and IP inventory prepared and up-dated</li> <li>1 Regional Sustainability Plan</li> <li>1 Consolidated regional report (IPs filed, tech commercialized, etc.)</li> </ul> <p>PEOPLE &amp; SERVICES:</p> <ul style="list-style-type: none"> <li>Coordinate &amp; host 1 national ABMS (last module &amp; graduation)</li> <li>Coordinated participation of 8 CMs on national IPMC</li> <li>10 CM staff trained/attended the national IPMC</li> <li>1 Regional IP Audit &amp; Inventory Workshop conducted</li> <li>Trained 10 CM Staff on IP Audit &amp; Inventory Workshop</li> <li>1 Regional Policy/Tech Transfer Protocol review conducted</li> <li>Trained 10 CM Staff on Policy/TTP Review</li> <li>1 Regionwide IPMC conducted</li> <li>Trained 20 CM Staff on echo IPMC</li> <li>Participate in the content build-up &amp; updating of RAISE RTMS</li> <li>1 Regional tech-business pitch day conducted</li> <li>1 Regional promotional activity conducted (e.g. exhibits, bootcamps, IP caravan, etc.)</li> <li>Participation to the National Pitch Fest</li> </ul> <p>PLACES &amp; PARTNERSHIPS</p> <ul style="list-style-type: none"> <li>8 CMs assisted in the commercialization of technologies</li> <li>1 RAISE Advisory Council created</li> </ul>   | Bohol Island State University (BISU)          | The target beneficiaries of this project are the IP offices of each participating agency; in particular, the technology generators involved in IP management and technology commercialization activities; teaching and non-teaching staff and university students.  | 01-Oct-23 | 30-Sep-25 | ONGOING                          | 5,093,952          | 1,134,988.00     |





| 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, 2024 | Total Project Cost | 2024 PCAARRD GIA |
|---|--|---|---|---|--|---|-----------|-----------|---------------------------------|--------------------|------------------|
| Regional Agri-Aqua Innovation System Enhancement (RAISE) Program in Central Visayas   | Project 3A. Establishment of the Agri-Aqua Technology Business Incubator in Bohol Island State University (BISU) through the RAISE Program   | Integrity of the environment and climate change adaptation and mitigation | Technology Business Incubation (TBI) is described as a facility that houses start-ups and offers business development services. The DOSt-PCAARRD thinks that aiding SUCs in establishing their respective agricultural TBIs can boost regional economic development by fostering entrepreneurship, job creation and public-private partnerships. In the TBI setup, start-ups are housed in the incubator, which also offers business development services. A TBI's main objective is to promote the commercialization of research findings as well as the acquisition and application of cutting-edge state-of-the-art technology, which would encourage the utilization of resources. TBIs are therefore an explicit tool for the transfer of technology. The idea of technology for business has emerged as a crucial strategy for the creation of new businesses and the commercialization of established technologies, particularly those produced through university research and development projects. TBI is seen as a viable innovation mechanism that fosters the expansion of technology-based businesses. TBIs in the Philippines aim to create businesses that can operate sustainably and compete in the market once they leave the incubator (DOSt-PCAARRD). The creation of BISU ATBI will serve as a center for technology transfer, and business incubation in the university that will provide services necessary for the establishment of for would-be entrepreneurs. Focusing on food and non-food products, commercialization, it is hoped that the technologies generated through research and development will be transferred to potential adopters.   | Publication: 1 ATBI business plan develop 1 ATBI operations manual revised as needed 2 basic incubation curricula revised as needed 2 IEC or promotional material for the ATBI produced 1 promotional video for the ATBI developed 10 IEC or promotional materials for the incubates developed 2 promotional videos for the incubates developed 1 ATBI sustainability plan developed and implemented 1 ATBI communication plan developed and implemented 1 Patent 10 trademarks filed 10 copyrights filed Product: 10 technologies incubated/adopted by incubates People: 10 incubates assisted and enrolled under incubation program 1 trainings for the ATBI staff conducted or participated in 10 trainings for the incubates conducted 10 business plans for incubates developed 3 awareness seminars or promotional activities conducted 3 business pitching events, industry meetups, or networking events conducted or participated in 2 ATBI staff attended the national ATBI MC 2 ATBI staff attended the national TCMS 1 Institutional echo seminar conducted 1 trained 3 staff on echo seminars 2 benchmarking activities conducted ATBI operations fully integrated to PCAARRD's ATBI web-based M&E system Place: 10 MOAs/MOUs with the incubates forged 6 MOAs/MOUs with organizations from the public and private sectors forged/renewed ATBI Advisory Board/Committee/Council created and convened Policy: ATBI institutionalized with approved Board Resolution ATBI-related policies of the University revised as needed | Bohol Island State University (BISU)                                 | The beneficiaries will include those who are willing to adopt innovation in the AANR sector such as the technology adopters, generators, micro and small enterprises, cooperatives, associations, and other interested individuals/groups   | 01-Oct-23 | 30-Sep-25 | ONGOING                         | 4,732,992          | 965,748.00       |
| Regional Agri-Aqua Innovation System Enhancement (RAISE) Program in Central Visayas   | Project 4. Establishment of Regional Knowledge Management Hub in Central Visayas through the RAISE Program   | Integrity of the environment and climate change adaptation and mitigation | Accessibility or availability of information regarding the existing and completed research and available technology is very crucial to avoid duplication of effort, time, and money that is spent by every researcher and funding source to develop such technology. With the implementation of communication and promotional strategies for sharing information, the gap in the accessibility and availability of the information will be addressed. Furthermore, the strategies will ensure that every researcher of the consortium member institutions will be able to connect, build relationships and collaborate with each other so that the targeted goals of the consortium will be accomplished. The communication and promotional strategies will also play a significant role in guiding technology generators in moving the commercialization of their technology for the benefit of society. Information on pre-commercialization will be made available in the created IEC materials so that technology generators will not stick on producing a laboratory scale prototype but will have an idea on how to prepare their technology for whatever commercialization pathway they will take. The communication and promotional strategies will also collect data on the potential industry partners, their commerciality interest, and contact details for the benefit of the technology generators that are looking for industry collaborators. The establishment of communication and promotional strategies will also allow information sharing to other research institutions, local government units, entrepreneurs, and venture capitalists. This will serve as their guide for possible collaboration and engagement. IEC materials will provide information on the technology developed by the consortium member institutions. The local government unit and entrepreneurs will be informed of the available technology that may solve the problem that they are currently facing. The venture capitalist, on the other hand, will have better options on the technology that they want to venture on. With the implementation of these strategies, there is a greater chance that technology generated will bring an impact on the economy. In face-to-face communication it will be much easier to convince people, build stronger connections, understand better body language, quicker team engagement, and more effectively. Print communication channel is intended for a wide range of targeted internal and external audiences and can be either one or two-way communication. Web & Multimedia channels can cater broad stroke messages, are mostly one-way communication and feedback is appreciated but not always required. Audiovisual channel focuses on internal audiences which are primarily targeted and mostly a two-way communication. Broadcast is intended for external audiences, messages are mostly general and the communication process is one-way. Combining these tenets of strategic communication will help create effective messages and sharing of knowledge resources will be made easy and information will be more accessible by the public. | 1 SPY1Y2TOTAL/PUBLICATION Regional Training Reports 1123 promotional materials (Video, print/social media, RAISE calendar) developed 23 PATENT 11 IP Application 112 copyrights filed for promotional materials developed 2 PRODUCT 1 Reg™ Inventory of Knowledge Resources 111 Reg™ CommPlan prepared & updated 111 consolidated CM CommPlan prepared & updated 111 consolidated Tech CommPlan prepared & updated 1100 Agri-Aqua technology-based IEC materials collected for E-Lab, publishing/2021000. Consolidated regional report 1 PEOPLE & SERVICES Coordinated participation of 5 CMs on national IPMS&S IEC Staff trained/attended the national IPMS&S 10/10/Reg™ Inventory of Knowledge Resources Workshop conducted 25888 span style="font-size: 10pt; font-family: Arial; color: rgb(0, 0, 0); background-color: transparent; font-weight: normal; font-variant: normal; font-variant-east-asian: normal; font-variant-alters: normal; vertical-align: baseline; white-space: collapse  | Cebu Institute of Technology-University (CIT-U)                      | The output of this project is beneficial to all individuals involve in agriculture, aquatic and natural resources (AANR) commodities. Specifically, the IEC materials and the training/pitching activities that will be conducted, will be useful for researchers, innovators, entrepreneurs, LGUs, research institutions, and venture capitalists. | 01-Oct-23 | 30-Sep-25 | ONGOING                         | 2,498,800          | 604,700.00       |
| Regional Agri-Aqua Innovation System Enhancement (RAISE) Program in Ilocos Region     | Project 1B. Strengthening the IP-TBM Office in Ilocos Sur Polytechnic State College through the RAISE Program  | Integrity of the environment and climate change adaptation and mitigation | Ilocos Sur Polytechnic State College is one of the Higher Education Institution (HEI) of the province which has starts its existence in 1996 by virtue of Republic Act 7980 authored by Cong. Eric D. Sison in full support to this provincial vision. Research is one of the four-fold function of Ilocos Sur Polytechnic State College. With the concerted effort in the administration, researchers were motivated to conduct and undergo various studies resulting to numerous research outputs. Various equipment, tools and materials have been created and developed. In this connection, the need to established and recognized the intellectual property of the creators and developers is deemed important.   | Publication: - At least 1 training module 1 IEC 1 Sustainability plan/Patent: At least 6 IP application/Product: At least 1 Inventory of Potential IPs At least 1 Inventory of IP Assets At least 1 Prior Art Search of R&D project At least 1 technology with pre-commercialization, reports At least 1 business plan of incubate At least 1 Product manufactured form pre-commercialization/ market tested At least 1 Inventory of knowledge resources At least 1 technology Commercialization/People: Trained At least 5 ISPSC Researchers IP Masterclass At least 1 Prior Art Search & IP Audit Workshop Technology Commercialization Membership Series Pitch Commercialization Day At least 1 ISPSC Researcher trained/coordinated business network/Place: - At least 1 Commercialization Agreement - At least 1 Partnership Agreement with Business Groups/ Trade Institutions/Policy: Full implementation of IP Policy and technology transfer protocols (Internal MOAs, etc.)   | Ilocos Sur Polytechnic State College (ISPSC)                         | Faculty and fulltime researchers of ISPSC will be the major beneficiary of the program and also for the external stakeholders of the College.   | 01-Jan-22 | 30-Jun-24 | COMPLETED                       | 1,600,000          | 338,856.76       |
| REGIONAL AGRI-AQUA INNOVATION SYSTEM ENHANCEMENT (RAISE) PROGRAM IN NORTHERN MINDANAO | Project 1. Regional Intellectual Property And Technology Business Management (IPTBM) In Northern Mindanao Through The RAISE Program  | Integrity of the environment and climate change adaptation and mitigation | Component A: Establishing Regional IPTBM/The Regional IPTBM, a project component of the RAISE Program is aimed at establishing IPTBMs among the Consortium Member Institutions (CMIs) in Northern Mindanao. It will assist in establishing the IPTBM at the MSU-Nawawan (MSUN) in Laran del Norte and USTP at Ozamiz (USTP-O) in Misamis Oriental. These two CMIs are chosen because they are active in conducting agriculture and aquaculture research projects with great potential for IP protection and commercialization. This project will also assist two existing IPTBMs, namely the CMU-IPTBM and MSU-IPTBM. These two CMIs had been in the IP Management business for four or more years. They are both recipients of the Platinum Awards from INPHIL for their excellent performance in IP management and commercialization. However, they need continuing support to sustain the momentum of their IP management and commercialization activities because they are not yet generating enough royalties to fund their activities. Component B: Enhancing CMU-IPTBM Through the RAISE Program The participation of CMU in the DOSt-PCAARRD IPTBM Program capacitated the CMU IP personnel to manage CMU's IP assets. The capacity building was made possible through attendance in the DOSt-PCAARRD IP Master Classes and Technology Transfer and Commercialization Mentorship Series. Due to the enhanced capabilities of the CMU IP Personnel, 175 CMU faculty members were trained on claim drafting in July 2018 and December 2022 which resulted in the filing of 150 IPs; 29% of which were patents, and 47% were utility models. One hundred one (67%) of the 150 IPs filed were already granted Certificates of Registration. In addition, the IP personnel revised the CMU PFR Policy, which the CMU BIOR approved via BIOR Resolution 465, series 2020 on July 31, 2020. They also facilitated the commercialization of four technologies through the establishment of spin-off companies. To continue what has been started, CMU needs more support to sustain its effort in IP Protection and Commercialization. It is through this RAISE Project that CMU-IPTBM will be able to intensify the commercialization activities of the registered technologies. With this project, CMU-IPTBM is optimistic to serve a wider clientele by providing opportunities to assist the non-CMU-affiliated technology generators in registering their IPs.   | Expected Outputs of Component A/Project 1 - Regional IP-TBMY1Y2TOTAL/PUBLICATION consolidated training report of all the CM participants who attended IPMC11 training report on regional echo IPMC (including PMS) 111 training report on reg™ IP Audit &amp; Inventory Workshops IP PATENT Copyright of training report (PRODUCT) Reg™ list of Priority R&amp;P D Areas/commodity prepared and updated 121 Reg™ technology and IP inventory prepared and updated thru the RIMS 1121 Regional Sustainability Plan (Separate from the CM Sustainability plan; assist CMs in drafting their sustainability plans) 111 Consolidated regional report (IPs filed, tech commercialized, etc.) 12 PEOPLE & SERVICES Coordinated participation of CMs personnel in national IPMS&S 888 Staff trained/attended the national IPMS&S 888 Reg™ IP Audit &amp; Inventory Workshop conducted 111 Trained CM Staff on IP Audit &amp; Inventory Workshop 2588 span style="font-size: 10pt; font-family: Arial; color: rgb(0, 0, 0); background-color: transparent; font-weight: normal; font-variant: normal; font-variant-east-asian: normal; font-variant-alters: normal; vertical-align: baseline; white-space: collapse   | Central Mindanao University (CMU)                                    | Target Beneficiaries: CMIs/Technology Transfer Officers/MSMEs/Entrepreneurs/Incubates/Farmers, Inventors/Technology Generators/Faculty/Researchers/University Graduates/Technology Investors/VCS/Angels, other R&D & S&T Partners/Thesis advisers and students preparing thesis   | 01-Oct-23 | 30-Sep-25 | ONGOING                         | 5,000,000          | 2,447,436.80     |
| REGIONAL AGRI-AQUA INNOVATION SYSTEM ENHANCEMENT (RAISE) PROGRAM IN NORTHERN MINDANAO | Project 1A. Enhancement Of The Intellectual Property And Technology Business Management (IPTBM) In Mindanao State University- Iligan Institute Of Technology (MSU-IIT) Through The RAISE Program | Integrity of the environment and climate change adaptation and mitigation | The project focuses on the sustainable intensification of the Intellectual Property and Technology Business Management (IPTBM) that mirrors DPPTIC™s aim to provide the optimum environment for researchers and the external partners. Discovery, learning, and social engagement are mutually its supportive core missions in fostering and advancing innovative and entrepreneurial culture through effective and efficient protection, transfer, commercialization of MSU-IIT intellectual properties (IPs) and strategic partnerships to benefit society and promote economic development.  | Publication: At least 5 IECs for SUC/RDI technologies/Patent: At least 10 patent applications Copyright of IECs/Product: 10 Prior Arts Search (PAS) Reports 1 IP inventory of mature technologies 1 Inventory of knowledge resources 1 Commercialization plan 1 Technology with pre-com reports 2 Technologies pitched 1 Technology Commercialized (Y2)/People: 2 CM staff attended Prior Art Search & IP Audit Workshop 2 CM staff trained in IP MasterClass 2 CM staff trained in Agribusiness MasterClass 2 CM staff trained in TCMS 2 CM staff trained in TechPromotion Mentorship 2 CM staff attend CommPlan Workshop 2 CM staff attended Reg™ IP Policy/Tech Trans Protocol Review 2 Participants to content build up of RTMS Place: 1 Commitment Letter 1 Partnership agreement w/Business/Trade Institutions 1 Commercialization Agreements (Y2)/Policy: Full implementation of IP policy (with internal memos, AOs) Full implementation of technology transfer protocol (with internal memos, AOs  | Mindanao State University - Iligan Institute of Technology (MSU-IIT) | Target Beneficiaries: CMU-IPTBM Personnel Faculty/researchers Thesis advisers Students preparing thesis projects Local entrepreneurs  | 01-Oct-23 | 30-Sep-25 | ONGOING                         | 2,500,000          | 1,190,000.00     |

| 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, 2024 | Total Project Cost | 2024 PCAARRD GIA |
|---|--|---|---|--|---|---|-----------|-----------|---------------------------------|--------------------|------------------|
| REGIONAL AGRI-AQUA INNOVATION SYSTEM ENHANCEMENT (RAISE) PROGRAM IN NORTHERN MINDANAO | Project 1B. Establishment Of The Intellectual Property And Technology Business Management (IPTBM) In Mindanao State University At Naawan (MSUN) Through The RAISE Program  | Integrity of the environment and climate change adaptation and mitigation | The IPTBM of MSU at Naawan shall aim to address the intellectual property concerns of the university, particularly in facilitating copyright and patent registrations, receiving disclosures assisting patent applications, and safeguarding intellectual property-related agreements. Engaging activities shall also be initiated through the conduct of ideation activities where industry and potential inventors/scientists meet to level of technology needs between the user and the creator and the planned industry immersion where inventors/scientists get to see the actual scenario in the industry and intend to develop possible solutions on it.   | Expected Outputs (OPs):Publication— 3 promotional IECs/Patent/Intellectual Property—5 IP Reports— 1 IPRs & technologies inventory updated— 1 inventory of knowledge resources prepared and updated— 1 CMI commercialization plan developed and implemented— 1 Technology Commercialization Plan developed and implemented— 1 Technology with pre-commercialization reports— 2 Technologies pitched— 1 Technology Commercialized/People and Services— 2 CMI staff trained in national IPAC— 2 CMI staff trained in national ABMC— 2 CMI staff trained in national TCMS— 2 CMI staff trained in national TMSB— 2 CMI staff attended in regional IP Audit and Inventory Workshop— 2 CMI staff attended in regional IP Policy/Technology Transfer Protocol review— 2 CMI staff attended in regional Commercialization Plan Workshop— 1 Institutional echo seminar conducted— Trained 10 staff in echo seminars— Participated to content build-up of RTMSPlace and Partnership— 1 Commitment Letter for the national training— 1 Partnership agreement with Business/Trade Institutions— 1 Commercialization Agreement/Policy— 1 Institutional IP Policies reviewed/ crafted— 1 Technology Transfer Protocols reviewed/ crafted | Mindanao State University (MSU- Naawan)   | Target Beneficiaries: Students, Faculty, Staff, Stakeholders (Farmers, Fishermen, other partner organizations)  | 01-Oct-23 | 30-Sep-25 | ONGOING                         | 2,500,000          | 1,260,000.00     |
| REGIONAL AGRI-AQUA INNOVATION SYSTEM ENHANCEMENT (RAISE) PROGRAM IN NORTHERN MINDANAO | Project 1C. Establishment Of The Intellectual Property And Technology Business Management (IPTBM) In The University Of Science And Technology Of Southern Philippines Claveria Campus (USTP-C) Through The RAISE Program | Integrity of the environment and climate change adaptation and mitigation | Strengthening the capacity of USTP's Innovation and Technology Solutions Office (ITSO) and Technology Promotions and Commercialization Office (TPCO) for the Intellectual Property and Technology Business Management (IP-TBM) operations to be an operational one-stop-shop for technology owners and generators, innovators, and users, and other stakeholders to facilitate the commercialization of technologies generated, preferably along the AARR series. The concept of intellectual property patenting has become crucial in fostering innovation and creativity, as it incentivizes investors and creators to invest their time and resources into developing new and unique ideas. The protection granted under these efforts has become increasingly relevant in today's rapidly advancing technological and creative industries. These encourage competition, reward innovation, and protect the inventors' rights to their creations. This legal framework provides a means of safeguarding the fruits of the researchers and innovators of the university while also fostering an environment where intellectual property can be shared and exchanged freely.   | Publication: At least 2 promotional IECs for technologies/Patent: At least 4 IP (patent and utility model only) applications/Product: 1 inventory of IP assets<br>At least 1 Technology Commercialized/People:<br>At least 3 IPTBM faculty and staff extensively trained under the IP Master Class and Technology Commercialization Mentorship Series<br>At least 3 IPTBM staff attended a local IP workshop for, Commercialization with IPTBM staff as trainer/speaker<br>At least 1 networking events and technology promotion conducted<br>At least 1 technology talent/adaptor Place:<br>1 IPTBM enhanced/established and institutionalized<br>At least 1 adoption agreement executed<br>1 Memorandum of Agreement signed<br>At least 1 partnership agreement with the Philippine Chamber of Commerce Inc./ Business Groups/ Marketing or Trade Institutions<br>At least 1 commercialization agreement executed<br>Policy:<br>1 Institutional IP Policies reviewed/ crafted<br>1 Technology Transfer Protocols reviewed/ crafted   | University of Science and Technology of Southern Philippines Claveria Campus (USTP-C) | Target beneficiaries are: Farmers, SMEs, and other stakeholders.  | 01-Oct-23 | 30-Sep-25 | ONGOING                         | 2,500,000          | 1,338,724.00     |
| REGIONAL AGRI-AQUA INNOVATION SYSTEM ENHANCEMENT (RAISE) PROGRAM IN NORTHERN MINDANAO | Project 2. Establishment Of Regional Agri-business Hub (ABH) In Northern Mindanao Through The RAISE Program  | Integrity of the environment and climate change adaptation and mitigation | The Regional Agribusiness Hub (R@Hub) project, one of the projects under the Regional Agri-aqua Innovation System Enhancement (RAISE) Program, is designed to support the development of viable agribusiness enterprises hub in the Selected Consortium Member Institution that will provide business skills and trainings to the 2hub staff that will facilitate and management their own centers that focus on Technology transfer and commercialization. The activities will help in preparation of business plan and feasibility studies to support in funds sourcing for the needed investment to enable them to scale out their business successfully including the establishment of partnership with business companies for technology commercialization. This project will help address the issues on a number of research outputs that were not commercialized thus the agribusiness hub will develop an enabling environment for SUCs researchers to commercialize their technologies. The first phase of the project is designed to organize Regional agribusiness team and create an enabling environment for agribusiness enterprise development through production of @hub operational manual and inventories of research outputs as well development of training designs and modules for capability building programs and pre-commercialization services to the mentees which include the agribusiness coaching and mentorship program as well as commercialization processing services for technology transferred . | Publication:<br><br>Three (3) Regional trainings<br><br>Process documentation on the establishment of Agribusiness Hub<br><br>Patent: xxxProduct:<br><br>10 Pre-commercialized services<br><br>Technology with business plan<br><br>Technology with feasibility study<br><br>Technology with Market study  | Central Mindanao University (CMU)   | The target beneficiaries of this project are the institutional Researchers Faculty and Students and RCMO Project Leaders whose research work are already ready for pre-commercialization. | 01-Oct-23 | 30-Sep-25 | ONGOING                         | 2,499,800          | 1,169,900.00     |
| REGIONAL AGRI-AQUA INNOVATION SYSTEM ENHANCEMENT (RAISE) PROGRAM IN NORTHERN MINDANAO | Project 3. Regional Agri-Aqua Technology Business Incubator (ATBI) In Northern Mindanao Through The RAISE Program  | Integrity of the environment and climate change adaptation and mitigation | The regional ATBI will be established to support NOMCAARRD CMIs and ATBIs in the transfer of technologies through capacity building, technology business incubation, and co-incubation in the agriculture and aquaculture sector in the region. The regional ATBI will help strengthen existing ATBI and mentor one (1) university from the consortia member institutions (CMIs) of NOMCAARRD for its ATBI establishment to facilitate the commercialization of Agri-Aqua technologies and products in Region X. The existing ATBI will be strengthened under the Regional ATBI is the CMU-ATBI. CMU-ATBI provides business support services for the commercialization of research-generated technologies of CMU. Since the project's inception in 2018, the CMU-ATBI has assisted 26 incubates with different technologies. The incubates received support services that helped them grow their respective enterprises. In effect, they increased their income and provided job opportunities in the community. The CMU-ATBI aims to continually contribute to economic development through the sustainable operation of the unit in the region through the RAISE program. The Regional and CMU ATBI are separate but related project components that the CMU project team will implement. Both components provide an enabling environment for technology commercialization.   | Publication:<br><br>PUBLICATION<br><br>1 Regional Training Report<br><br>1 Regional ATBI Operations Manual crafted<br><br>1 Regional ATBI Curriculum/Service Prepared/Enhanced<br><br>At least 2 IEC or promotional materials for Regional ATBI developed<br><br>At least 1 promotional video for Regional ATBI developed and updated<br><br>At least 1 IEC or promotional materials for incubates developed   | Central Mindanao University (CMU)   | The target beneficiaries of this project are the technology adopters, technology generators, Agri-aqua start-ups, cooperatives, associations among others.                                | 01-Oct-23 | 30-Sep-25 | ONGOING                         | 6,700,000          | 3,582,500.00     |
| REGIONAL AGRI-AQUA INNOVATION SYSTEM ENHANCEMENT (RAISE) PROGRAM IN NORTHERN MINDANAO | Project 3A. Establishment Of The Agri-Aqua Technology Business Incubator In Mindanao State University At Naawan (MSUN) Through The RAISE Program   | Integrity of the environment and climate change adaptation and mitigation | The agriculture and aquaculture sectors are important contributors to the economy of the country. However, these sectors face numerous challenges like climate change, limited resources, and market competition. To address these challenges, Agri-aqua Technology Business Incubators are established to provide a nurturing environment for entrepreneurs and innovators to develop, refine, and commercialize technologies that address the challenges faced by the agri-aqua sectors. Incubators will support the development of technologies, provide resources and mentoring to incubates, and link them to different stakeholders like industry professionals, potential investors, researchers, etc.   | Publication:<br><br>Publications<br><br>1 ATBI business plan revised as needed<br><br>1 ATBI business plan revised as needed<br><br>1 ATBI operations manual revised as needed<br><br>1 ATBI operations manual revised as needed<br><br>At least 3 basic curricula revised od developed<br><br>At least 3 basic curricula revised od developed   | Mindanao State University (MSU- Naawan)   | The target beneficiaries of this project are the men and women of CMIs and technology generators, aspirant private entrepreneurs, and technology adaptors.                                | 01-Oct-23 | 30-Sep-25 | ONGOING                         | 3,957,280          | 1,964,330.00     |





| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|--|---|---|--|---|--|---|-----------|-----------|----------------------------------|--------------------|------------------|
| Regional Agri-Aqua Innovation System Enhancement Program in SOCCSKSARGEN | Project 1B. Establishment of Intellectual Property and Technology Business Management (IPTBM) in Mindanao State University-General Santos (MSU-GenSan) through the RAISE Program              | Integrity of the environment and climate change adaptation and mitigation | The Regional Agri-Aqua Innovation System Enhancement in Region 12 (RAISE- 12) Program under Project 1 will handle the Intellectual Property and Technology Business Management operations in Region 12 with its identified SUC mentees. This project will further enhance the intellectual property (IP) in the region and promote innovative change through IP protection and technology commercialization. Pursuant to RA 10555, the Technology Transfer Act of the Philippines, the project is hereby implemented to enhance intellectual property and technology business management (IPTBM) operations at Mindanao State University - General Santos (MSU-Gen San) under the RAISE- 12 program. MSU-Gen San will serve as one of CMIs to be part of the collaborative mobilization of technology transfer activities through regional capacity- building of IP and technology commercialization in SUCs. RAISE-12 recognizes the role of SUCs in promoting intellectual properties and technology commercialization for regional development.   | Publication: 3 IEC/Patent: 5 IP Applications (UM & Patent only) Copyright (IECs/Product: 5 PAS Reports 1 IP's & technologies inventory updated 1 inventory of knowledge resources prepared and updated 1 CM communication plan developed & implemented 1 Tech Commplan developed & implemented 1 technology with pre-comm reports 2 technologies pitched 1 Technology Commercialized, People: 2 CM staff trained in national IP/MC 2 CM staff trained in national ABMC 2 CM staff trained in national TCMS 2 CM staff trained in national TPMS 2 CM staff attended regl IP Audit & Inventory Workshop 2 CM staff attended regl IP Policy/ Tech Trans Protocol review 2 CM staff attended regl CommPlan Workshop 1 Institutional echo seminar conducted Trained # staff on echo seminars Participate to content build up of RTMS/Space: 1 Commitment Letter for the national trainings 1 partnership agreement w/Business/Trade Institutions 1 Commercialization Agreement/Policy: Crafting/enhancement of IP policy Crafting/enhancement of technology transfer protocol  | Mindanao State University - General Santos City (MSU-GSC)      | Technology transfer personnel MSU- Gen San faculty/researchers with technologies potential for IP protection Agri-Aqua and natural resources graduates MSMEs Young entrepreneurs/start-up   | 01-Oct-23 | 30-Sep-25 | ONGOING                          | 2,414,520          | 641,130.00       |
| Regional Agri-Aqua Innovation System Enhancement Program in SOCCSKSARGEN | Project 1C. Establishment of Intellectual Property and Technology Business Management (IPTBM) in Cotabato State University (CoSU) through the RAISE Program                                   | Integrity of the environment and climate change adaptation and mitigation | The Regional Agri-Aqua Innovation System Enhancement in Region 12 (RAISE- 12) Program under Project 1 will handle the Intellectual Property and Technology Business Management operations in Region 12 with its identified SUC mentees. This project will further enhance the intellectual property (IP) in the region and promote innovative change through IP protection and technology commercialization. Pursuant to RA 10555, the Technology Transfer Act of the Philippines, and RA 11203, Philippine Innovation Act, the project is hereby implemented to establish intellectual property and technology business management (IPTBM) operations at Cotabato State University (CoSU) under the RAISE- 12 program. CoSU will serve as one of CMIs to be part of the collaborative mobilization of technology transfer activities through regional capacity- building of IP and technology commercialization in SUCs. RAISE- 12 recognizes the role of SUCs in promoting intellectual properties and technology commercialization for regional development.                                | Publication: 3 IEC/Patent: 5 IP Applications (UM & Patent only) Copyright (IECs/Product: 5 PAS Reports 1 IP's & technologies inventory updated 1 inventory of knowledge resources prepared and updated 1 CM communication plan developed & implemented 1 Tech Commplan developed & implemented 1 technology with pre-comm reports 2 technologies pitched 1 Technology Commercialized, People: 2 CM staff trained in national IP/MC 2 CM staff trained in national ABMC 2 CM staff trained in national TCMS 2 CM staff trained in national TPMS 2 CM staff attended regl IP Audit & Inventory Workshop 2 CM staff attended regl IP Policy/ Tech Trans Protocol review 2 CM staff attended regl CommPlan Workshop 1 Institutional echo seminar conducted Trained # staff on echo seminars Participate to content build up of RTMS/Space: 1 Commitment Letter for the national trainings 1 partnership agreement w/Business/Trade Institutions 1 Commercialization Agreement/Policy: Crafting/enhancement of IP policy Crafting/enhancement of technology transfer protocol  | Cotabato State University (CoSU)                               | Target Beneficiaries:<br>Technology transfer personnel CoSU faculty/researchers with technologies potential for IP protection Agri-Aqua and natural resources graduates MSMEs Young entrepreneurs/start-up  | 01-Oct-23 | 30-Sep-25 | ONGOING                          | 2,414,520          | 618,630.00       |
| Regional Agri-Aqua Innovation System Enhancement Program in SOCCSKSARGEN | Project 1D. Establishment of the Intellectual Property and Technology Business Management (IPTBM) in Cotabato Foundation College of Science and Technology (CF CST) through the RAISE Program | Integrity of the environment and climate change adaptation and mitigation | The Regional Agri-Aqua Innovation System Enhancement in Region 12 (RAISE- 12) Program under Project 1 will handle the Intellectual Property and Technology Business Management operations in Region 12 with its identified SUC mentees. This project will further enhance the intellectual property (IP) in the region and promote innovative change through IP protection and technology commercialization. Pursuant to RA 10555, the Technology Transfer Act of the Philippines, and RA 11203, Philippine Innovation Act, the project is hereby implemented to establish intellectual property and technology business management (IPTBM) operations at Cotabato Foundation College of Science and Technology (CF CST) under the RAISE- 12 program. CF CST will serve as one of CMIs to be part of the collaborative mobilization of technology transfer activities through regional capacity- building of IP and technology commercialization in SUCs. RAISE-12 recognizes the role of SUCs in promoting intellectual properties and technology commercialization for regional development. | Publication: 3 IEC/Patent: 5 IP Applications (UM & Patent only) Copyright (IECs/Product: 5 PAS Reports 1 IP's & technologies inventory updated 1 inventory of knowledge resources prepared and updated 1 CM communication plan developed & implemented 1 Tech Commplan developed & implemented 1 technology with pre-comm reports 2 technologies pitched 1 Technology Commercialized, People: 2 CM staff trained in national IP/MC 2 CM staff trained in national ABMC 2 CM staff trained in national TCMS 2 CM staff trained in national TPMS 2 CM staff attended regl IP Audit & Inventory Workshop 2 CM staff attended regl IP Policy/ Tech Trans Protocol review 2 CM staff attended regl CommPlan Workshop 1 Institutional echo seminar conducted Trained # staff on echo seminars Participate to content build up of RTMS/Space: 1 Commitment Letter for the national trainings 1 partnership agreement w/Business/Trade Institutions 1 Commercialization Agreement/Policy: Crafting/enhancement of IP policy Crafting/enhancement of technology transfer protocol  | Cotabato Foundation College of Science and Technology (CF CST) | Technology transfer personnel CF CST faculty/researchers with technologies potential for IP protection Agri-Aqua and natural resources graduates MSMEs Young entrepreneurs/start-up   | 01-Oct-23 | 30-Sep-25 | ONGOING                          | 2,414,520          | 618,630.00       |
| Regional Agri-Aqua Innovation System Enhancement Program in SOCCSKSARGEN | Project 2. Establishment of Regional Agri-business Hub (ABH) in SOCCSKSARGEN through the RAISE Program  | Integrity of the environment and climate change adaptation and mitigation | The project titled "Establishing the Regional Agribusiness Hub for the Pre-Commercialization of Technologies in Region 12 is part of the program titled Regional Agri-Aqua Innovation System Enhancement (RAISE) Program. The RAISE program aims to hasten the commercialization and development of S&T based agri-aqua enterprises in the AANR sector in Region 12. The establishment of the regional agribusiness hub will facilitate the pre-commercialization phase of the technology. The project will provide assistance to regional consortia particularly the SOCCSKSARDEC, and its member institutions. The operation of this project will be spearheaded by the SOCCSKSARDEC.  | Publication:<br>3 Regional Training Reports<br>1 Consolidated training report of all the CM participants who attended to ABMC<br>1 training report on regional echo ABMC<br>1 training report on Agripreneurship<br>Patent: Copyright of Training Report<br>Product:<br>10 Pre-commercializations services<br>5 pre-comm for base agency (technology shall be owned by the base agency (pref. PCAARRD-funded), and shall be included in the list of tech offering for potential mobilization/modular) and 5 pre-comm for CMIs. Can either be 1 tech with all 5 pre-comm reports or different techs each with a pre-comm report; other precomm includes machine testing (MT)<br>2 technology with business plan<br>2 technology with feasibility study<br>2 technology with market study<br>2 technology with valuation<br>2 technology with enterprise plan (EP)<br>1 Consolidated regional report<br>PEOPLE & SERVICES<br>Coordinated & hosted 1 national ABMC (last module & graduation)<br>Coordinated participation of 5 CMs & 10 CM personnel on national ABMC<br>CM Staff trained/attended the national ABMC<br>National ABMC will be conducted by APP<br>1 Reg- v1 echo ABMC conducted<br>For RAISE & non-RAISE CMs, and other stakeholders<br>Trained 10 CM Staff on ABMC (echo)<br>1 Training on Agripreneurship for MSMEs or potential agripreneurs conducted<br>Potential clients of ATBI<br>Trained # of MSMEs on agripreneurship<br>Participate in the content build-up & updating of RAISE RTMS<br>Oversee updating of RAISE RTMS of the CMIs | University of Southern Mindanao (USM)                          | The target beneficiaries of the project are as follows:<br>Entrepreneurs, start ups<br>Market researchers<br>Consortia researchers and technology transfer officers<br>Prospective adopters of technologies or product generated from the agri-aqua sector<br>Government partners | 01-Oct-23 | 30-Sep-25 | ONGOING                          | 2,480,800          | 662,700.00       |
| Regional Agri-Aqua Innovation System Enhancement Program in SOCCSKSARGEN | Project 3: Regional Agri-Aqua Technology Business Incubator (ATBI) in SOCCSKSARGEN through the RAISE Program  | Integrity of the environment and climate change adaptation and mitigation | There are two Technology Business Incubators established in the region, the USM- ATBI and SKSU-ATBI but operating independently with minimal interaction with each other. DA-RFO 12, an active CM of SOCCARRDEC is also establishing its TBI. The efforts of these TBIs will be limited if they operate without coordination and interaction with each other. Their accomplishments will be better if these TBIs collaborate and work together towards achieving an effective and efficient innovation system in Region 12. Most of the CMs of SOCCARRDEC lack the mechanism to accelerate technology commercialization. The CM-RTMs generate technologies in an environment with limited connections to the industry and technology takers. With the existing work and plans of the different TBIs, there is a need to harmonize all activities to benefit not only a few but more, hence the need to establish the Regional Agri-Aqua Business Incubation Project, hence this project.   | Publication:<br>2 Regional Training Reports<br>1 Consolidated training report of all the CM participants who attended to TCMS<br>1 regl training report on national ATBI MC<br>Regional ATBI Operations Manual crafted<br>1 Regional ATBI Service Offering prepared<br>1 Consolidated curricula of existing & new ATBIs<br>1 consolidated curricula of existing & new ATBIs (For R3, R7, R10, R12); curriculum should be an output of the ATBI MC<br>Patent:<br>3 IP Applications<br>Copyright of Training Report<br>Product:<br>2 technologies co-incubated<br>Techs to be co-incubated shall come from non-ATBI CMs within or outside the region<br>1 Technology Commercialized with FGR / Facilitated the commercialization of 1 CM technology<br>Different from the reported commercialized techs under ATBI & IPTBM subcomponent projects<br>1 Consolidated regional report<br>PEOPLE & SERVICES<br>2 new incubates enrolled in any of the existing ATBIs<br>2 new incubates under co-modulation program<br>Coordinated participation of 5 CMs on national ATBI MC<br>10 CM Staff trained/attended the national ATBI MC<br>Coordinated participation of 5 CMs national TCMS<br>10 CM Staff trained/attended the national TCMS<br>1 Reg1 tech/business pitch play conducted<br>1 reg1 promotional activity conducted<br>Hosted 2 CMs in ATBI services<br>Participate in the content build-up & updating of RAISE RTMS<br>Participation to the National Pitch Fest   | Sultan Kudarat State University (SKSU)                         | Target Beneficiaries:<br>Agri-Aqua and natural resources graduates<br>Member SUCs of SOCCARRDEC<br>MSMEs<br>Young entrepreneurs   | 01-Oct-23 | 30-Sep-25 | ONGOING                          | 3,010,800          | 1,220,250.00     |

| 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, 2024' | Total Project Cost | 2024 PCAARRD GIA |
|--|--|---|--|--|---------------------------------------|---|-----------|-----------|----------------------------------|--------------------|------------------|
| Regional Agri-Aqua Innovation System Enhancement Program in SOCCSKSARGEN | Project 3A. Enhancement of the Agri-Aqua Technology Business Incubator (ATBI) in University of Southern Mindanao (USM) through the RAISE Program | Integrity of the environment and climate change adaptation and mitigation | The Regional Agri-Aqua Innovation System Enhancement in Region 12 (RAISE- 12) Program under Project 1 will handle the Intellectual Property and Technology Business Management operations in Region 12 with its identified SUC members. This project will further enhance the agri-aqua innovations the region through technology business incubation. This platform provides assistance to incubatees to promote startup developments Pursuant to RA 11327, the Innovative Startup Act of the Philippines, the project is hereby implemented to mobilize MSME development. Under the banner program of RAISE, wherein ATBIs are implemented under Consortia agencies. This will help sustain agri- aqua technology business incubator (ATBI) operations in the University of Southern Mindanao (USM) and continue its role for regional development. USM ATBI will continue mobilizing technology transfer through technology business incubation.  | Expected Outputs (OPs):Publication:Version 11 ATBI business plan revised as needed1 ATBI operations manual revised as needed10 basic incubation curricula revised as needed6 advanced incubation curriculum developed2 IEC or promotional material for the ATBI produced1 promotional video for the ATBI developed16 IEC or promotional materials for the incubatees developed2 promotional videos for the incubatees developed1 ATBI sustainability plan developed and implemented1 ATBI communication plan developed and implementedPatent:Version 110 trademarks filed10 copyrights filedProduct:Version 110 technologies incubated/adopted by new incubatees3 technologies incubated/adopted by continuing incubatees2 technologies co-incubated3 technologies commercialized with issued Fairness Opinion ReportPeople:NA/10 new incubatees enrolled at basic incubation program6 continuing incubatees enrolled to the advanced incubation program6 continuing incubates graduated from the advanced incubation program6 startups or spinoffs registered and launched6 trainings for the ATBI staff conducted or participated in 10 trainings for the incubatees conducted10 business plans for the new incubatees developed6 business plans for the continuing incubatees improved4 awareness seminars or promotional activities conducted4 business pitching events, industry meetings, or networking events conducted or participated in2 consortium member-agencies mentored on ATBI operations2 ATBI staff attended the national ATBI MC2 ATBI staff attended the national COMS1 Institutional echo seminar conductedTrained 4 staff on echo seminars1 benchmarking activity conductedATBI operations fully integrated to PCAARRD's ATBI web-based M&M;E systemPhase-Version 110 MOAs/MOUs with the new incubatees forged6 MOAs/MOUs with the continuing incubatees renewed MOAs/MOUs with organizations from the public and private sectors forged/renewedATBI Advisory Board/Committee/Council created and convenedPolicy/NA/ATBI institutionalized with approved Board ResolutionATBI-related policies of the University revised as needed | University of Southern Mindanao (USM) | Target Beneficiaries:Version 1FacultyStudentsTechnology generatorsCooperativesResearchersLocal entrepreneursLocal companies   | 01-Oct-23 | 30-Sep-25 | ONGOING                          | 3,830,200          | 942,550.00       |
| Regional Agri-Aqua Innovation System Enhancement Program in SOCCSKSARGEN | Project 4. Establishment of Regional Knowledge Management (KM) Hub in SOCCSKSARGEN through the RAISE Program                                     | Integrity of the environment and climate change adaptation and mitigation | The State Universities and Colleges (SUCs) in the Philippines have produced bulk of Knowledge Products (KPs) from the programs and initiatives they have implemented. With all these knowledge products generated, it is imperative that each needs a systematic tool in order to improve access for knowledge generation, sharing, collaboration and informed decision making. Knowledge Management (KM) is the best tool that consists of a cycle of creating, sharing, structuring and auditing knowledge; in order to maximize the effectiveness of an organization's collective knowledge. Organizations that effectively gather, store and share knowledge can encourage a culture of collaboration and curiosity. In turn, they see improved efficiency and employee satisfaction. Knowledge management means that employees can quickly access best practices, information on past projects and other key information that informs their work. Armed with that information, they can improve their performance and decision-making. The efforts in conducting projects and promoting the adoption of the technology generated can be aided through enhanced knowledge management. The importance of knowledge management is growing every year. One of the best ways to stay ahead of the curve is to build every organization in an intelligent, flexible manner. Hence, this project aims to establish an enhanced regional knowledge management through capacitating knowledge workers within the ANNR sector. In 2019, the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD) launched the program entitled eMainstreaming Knowledge Management within ANNR Sector. The SOCCSKSARGEN Agriculture, Aquatic and Natural Resources Research and Development Consortium (SOXAARRDEC) was one of the collaborating consortium of this program. A series of activities such as knowledge audit, raw listing of tangible resources and knowledge assessment were done. In addition, sessions on capacity building were organized by an expert and been attended by KM representatives of the Consortium Member Institutions (CMIs). | Publication:<br>2 Regional Training Reports<br>1 consolidated training report of all the CM participants who attended to TPMS<br>Inventory of Knowledge Resources Workshop and Complan to be embedded in the national TPMS<br>1 reg1 training report on national TPMS<br>3 promotional materials (video, print/social media, RAISE calendar) developed<br>Patent:<br>1 IP Application<br>1 TM for regional RAISE logo<br>2 copyrights filed for promotional materials developed<br>Product:<br>1 Reg-1 Inventory of Knowledge Resources<br>1 Reg-1 CommPlan prepared & updated<br>1 consolidated CM CommPlan prepared & updated<br>1 consolidated Tech CommPlan prepared & updated<br>25 Agri-Aqua technology-based IEC materials collected for E-Lib updating<br>1 Consolidated regional report<br>PEOPLE & SERVICES<br>Coordinated participation of 5 CMs on national TPMS<br>10 CM Staff trained/attended the national TPMS<br>1 Reg1 Inventory of Knowledge Resources Workshop conducted<br>Trained 10 CM Staff on Reg1 Inventory of Knowledge Resources Workshop<br>1 Reg-1 Complan conducted<br>Trained 4 CM Staff on Reg1 Complan<br>1 Reg1 tech/business pitch day conducted<br>1 reg1 promotional activity conducted<br>Participation to RTMS content build up training<br>Assisted 4 CMs in KM Mgt services<br>Facilitate consolidation of knowledge resources for the E-Lib<br>Facilitate and coordinate content build up of RTMS of the region<br>Participation to the National Pflah Fest   | University of Southern Mindanao (USM) | The target beneficiaries of the project are the following:<br><br>Knowledge Management CMs Representatives<br>Consortia CM researchers and technology generator<br>Prospective adoptors of technologies generated from this project<br>Government partners/Private industry<br>Students | 01-Oct-23 | 30-Sep-25 | ONGOING                          | 2,528,000          | 644,550.00       |