DOST Form 2 (for Basic/Applied Research)

DETAILED RESEARCH & DEVELOPMENT PROJECT PROPOSAL

(1) PROJECT PROFILE

Program Title:
Project Title: Optimization of Marble Cutting Operations through Marble Waste Utilization
Project Leader/Sex: Bilshan F. Servañez / Male
Project Duration (number of months): 12months implementation, 24 months monitoring and evaluation
Project Start Date: June 2023
Project End Date: June 2024
Implementing Agency: RSU REDi
Address/Telephone/Fax/Email: Liwanag, Odiongan, Romblon

(2) COOPERATING AGENCY/IES

DTI Romblon, Cocoville, Dapawan, Odiongan, Romblon
PGOR, Provincial Capitol, Romblon, Romblon
Romblon marble industry players c/o Hernandez Marble Supply, Cajimos, Romblon, Romblon

(3) SITE(S) OF IMPLEMENTATION

IMPLEMENTATION SITES NO.	COUNTRY	REGION	PROVINCE	DISTRICT	MUNICIPALITY	BARANGAY
1.	Philippines	MIMAROPA	Romblon		Romblon	Sawang
2.					Romblon	Cajimos
3.					Odiongan	Liwanag
4.						
5.						

(4) TYPE OF RESEARCH

_____ Basic
__x__ Applied

(5) R&D PRIORITY AREA & PROGRAM (based on HNRDA 2017-2022)

_____ Agriculture, Aquatic and Natural Resources
Commodity: _____
_____ Health
Priority Topic: _____
__x__ Industry, Energy and Emerging Technology
Sector: Mining and minerals
_____ Disaster Risk Reduction and Climate Change Adaptation
_____ Basic Research
Sector: _____

Sustainable Development Goal (SDG) Addressed

Goal 8: Decent Work and Economic Growth
Goal 9: Industry, Innovation and infrastructure.
Goal 12: Responsible Consumption and Production

(6) EXECUTIVE SUMMARY (not to exceed 200 words).

The project will explore a more viable option for marble cutting plant wastes by creating graded, high-value ground calcium carbonate (GCC). Marble selvedge cuts and saw fines that are byproducts of marble slab cutting will be put to better use by grinding these into fine powder. The powder will be subject to chemical and physical analyses to determine calcium carbonate content, whiteness, and particle size. Marble grades based on these parameters will then be established for Romblon ground calcium carbonate. Recommended applications for these grades will be made based on standard industry requirements. The project is expected to create optimized plant operations by maximizing profits of plant owners.

(7) INTRODUCTION

(7.1) RATIONALE/SIGNIFICANCE (not to exceed 300 words)

The marble industry in Romblon has around 30 marble cutting plants turning out about 260,000 sqm marble slabs annually. At the cutting plants, marble wastes litter the grounds. These come in the form of saw fines and selvedge cuts from cutting operations. The saw fines go into the settling tanks together with the saw cooling water. The saw fines settle in the bottom of the tanks and are removed periodically and disposed of in landfills or reclamation areas. The selvedge cuts are reduced by the workers into rubbles through manual chipping. Children and women join the males in the plant for this occupation and earn PhP16 per 19-liter kerosene can. The rubbles are then brought to Manila and Bulacan and sold for PhP2.50 per kilogram. Seven cutting plants and quarry owners bring about 560 tons of rubbles to the mainland weekly and spends PhP1.60 per kilogram for freight and labor costs. These rubbles are milled into fine powder as ground calcium carbonate (GCC) and sold for industrial applications. The demand for these rubbles is huge and the buyers are asking for more.

In a recent marble consultation dialogue with key industry players in Romblon the cutting plant owners expressed their concern on the rubbles trading. The amount that they could get per kilogram could be around PhP30 to PhP70 if the rubbles are ground in the province. More employment may be generated if the processing plant is in the province. Other industrial plants using GCC may also set up shop in Romblon further enhancing employment opportunities. A plant with a research laboratory for evaluating the physico-chemical properties of GCC may also create more R&D for the marble industry.

(7.2) SCIENTIFIC BASIS/THEORETICAL FRAMEWORK

Input	Process	Output
Marble cutting plant wastes	Waste collection Grinding Physical and chemical analyses	Graded Romblon GCC for specific applications

The study will follow the IPO model or the Input-Process-Output development scenario. Marble cutting plant wastes that may take the form of selvedge cuts and saw fines are the inputs to the study. Other inputs like quarry rejects may also be considered. The inputs will be classified as to quarry source and as to local stone nomenclature for output reference. Collection and segregation in the process side will have to be done systematically. The collected wastes will still be classified according to source and local marble nomenclature. The wastes will then be grinded into GCC in a facility financed partly by this project. The GCC will then be subject to different physical and chemical tests to be able to determine their chemical content, whiteness and particle size. These properties will determine the grades of the Romblon GCC and will be used to label the products specific for a particular use.

(7.3) OBJECTIVES

The general objective of the proposal is to create a ground calcium carbonate processing facility and laboratory. Specifically, the research proposal aims to:

1. provide a processing plant cum laboratory to manufacture and test GCC for industrial purposes;
2. provide a high-end market for marble wastes;
3. conduct characterization studies for GCC from different quarries and cutting plants and to recommend the grades of GCC specific for an application;
4. operate the plant for profit, for academic and for R&D purposes.

(8) REVIEW OF LITERATURE

Calcium carbonate in the form of chalk, dolomite, limestone and marble is perhaps the most widely available and utilized mineral in the world additives today. Processed to a wide range of particle sizes, the products function as low cost fillers added to extend and cheapen the widest range of polymeric systems. Ground calcium carbonates (GCC) are main components of ceramic tile adhesives, sealants and fillers where 80% of the formulation is composed of GCC. GCC is used as dietary supplement and antacid in feedstuff. In construction it is used as fillers for asphalt plasters and roofing felt. Emerging applications are in specialist concrete and grout where consistency in particle size and handling characteristics matter most. For environment use, GCC is used in flue scrubbers for desulfurization, de-acidification of rivers and forests, and drinking water treatment. It is also used as passive fire protection in coal mines. It is also a useful ingredient in agriculture for stabilizing soil acidity and for providing calcium to crops. In households it is a dietary supplement and has other uses from cleaning rice or a component of shoe polish. It is an essential component in the manufacture of flat and container glass. It is an ingredient in pottery glazes. GCC is an aid in pigmentation and controlling finish in paints. Fine grades of GCC are also used in paper manufacture as it reduces acidity in paper thereby increasing its durability. GCC finds use in plastic products as fillers adding density, reducing cost and improving rheology. It also finds its way in manufacture of latex carpet backing and helps in improving flow properties of rubber materials that are to be extruded or moulded (British Calcium Carbonates Federation)

Aside from the abovementioned uses, marble may also be beneficiated for use in jewelry and decorative items as in the study of Mahumapelo and Magaseng (2014) in Johannesburg. The study concluded that beneficiation of marble presents a good opportunity for job creation and value addition. However, a good marketing strategy for the products needs to be developed.

Calcium carbonate is an essential material for the manufacture of paints and coatings. Quality of raw material is important in the manufacture of calcium carbonate to make it as white as possible. Titanium dioxide which constitutes about 50% of the cost in paint manufacturing could now be replaced with calcium carbonate by up to 40% (Calcium carbonate of Kenya).

Ground calcium carbonate is used in a number of coating and paint applications. It is used as an extender, an agent to either reduce or enhance gloss, it is also a spacer/extender for titanium dioxide, a rheology modifier and as an additive to densify paint products. A company that produces Hubercarb

W235 manufactures the unique grade from the purest and brightest limestone ore available. To make the grade the ore must have very low silica level at 0.05% which is considered non-detectable. The properties of this grade are as follows (Huber Carbonates, LLC 2018):

Median particle size, μ	13
Brightness (Hunter reflectance)	92
Moisture (%, ASTM D-280)	0.1
Loose bulk density (lbs/ft^3, ASTM C-110)	50
Compacted bulk dnsity (lbs/ft^3, ASTM C-110)	75
Acid solubility (% in HCl)	99.8

Typical chemical analysis is as follows:

Calcium carbonate	99.3%
Magnesium carbonate	0.4%
Silicas and silicates	0.05%
Iron	40ppm
Leachable chlorides	<5ppm
Other	0.23%

The particle size (screen) analysis:

Mesh size -325 (45μm)	95%

Mineral properties are as follows:

Color	White
Alkalinity (as NaOH), ASTM D-1208)	0.4mg/gm
pH (ASTM D-1208)	9.4 (saturated solution)
Hardness, Handbook of Chemistry and Physics	3Mohs; non-abrasive
Solubility, Handbook of Chemistry and Physics	0.00035gm/100mL H_2O, 100^{0}C
Particle size (Microscope)	Irregular and uniaxial
Specific gravity (ASTM D-153)	2.7
Refractive index, Handbook of Chemistry and Physics	1.6
Weight per gallon (s.g. x 8.345)	22.6 lbs/solid gallon
Linear expansion coefficient, Handbook of Chemistry and Physics	4.3 x 10^{-6}/^{0}C

These properties will be investigated in the ground calcium carbonate product of this research.

(9) METHODOLOGY

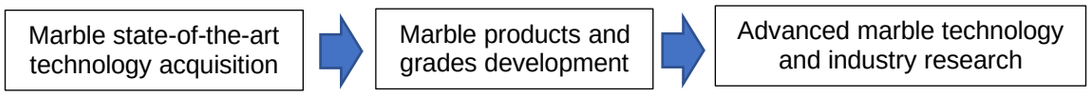
The project will be done in two phases. Phase 1 is the facility establishment phase, while Phase 2 will entail the research phase. The first phase will be conducted the second semester of 2023 while the second phase will be done on the first semester of 2024.

Facility establishment will be done in the second semester of 2023. Funds from the project will be used in equipment acquisition. For equipment installation, the cooperator will be asked to provide the counterpart fund for housing the equipment, installation of foundations for the machinery and providing for electrical connections. The facility will be located in the RSU Sawang Campus or in the premises of one of the industry partners. If the latter site is chosen, a MOA between RSU, DOST-MIMAROPA, and the industry partners will be made stipulating among others the ownership of the equipment. Meanwhile that the facility is being established, RSU researchers will conduct environmental scanning on how to go about implementing the research. They will study the different cutting plants in Romblon as well as the quarry sites where raw materials for cutting are derived. They will then make classifications of the cutting plants based on the raw materials being used. This will systematically classify the wastes as to origin. Cutting plants with more than one supplier of raw materials will not be sampled in the study. The researchers at this point will also look for possible laboratories where the GCC will be tested for the properties earlier presented.

The second phase will be GCC production through the equipment earlier established in Phase 1. Careful sample gathering must be ensured so that the samples will be from known quarries and with uniform color. Romblon marble have different colors depending on the chemical content. This will be the basis for grading later. Samples derived from the milling equipment will be tested based on the physical and chemical tests that will be used in grading the samples. Grades will be based largely on the sample size, calcium carbonate content, and whiteness. Other physico-chemical properties may also be included in grading for specific uses determined by industrial users. The funds for the tests will also be provided by the funding agency. Counterpart funds for operations will be provided by the RSU. Samples and equipment operations expenses will be provided by the industry partners.

Once tests are completed, the characteristics of the GCC from different quarry and cutting sites will largely determine the grades that will be provided to these products.

(10) TECHNOLOGY ROADMAP (if applicable) (use the attached sheet)



The following roadmap is being proposed for the marble industry in Romblon. The short term activities are for state-of-the-art marble technology acquisition. This was earlier conducted in 2022 when the RSU acquired current and state-of-the-art marble processing and quarrying equipment. The various equipment are expected to facilitate marble quarrying and processing of marble into polished tiles and other household products. The equipment that will be acquired in this proposal, and still part of the first phase, will enhance resource optimization by converting wastes into high value products. The second phase of the road map will consist of product development and the establishment of product grades and standards. This will not only be true for marble slabs and tiles but also for the ground calcium carbonate that will be generated from this project. Developed products and grades will further enhance marketability of Romblon marble and also contribute largely to the economic activity generated by this commodity. The third phase will be a more advanced research and development in the industry. This may include machine development, product research and industry establishment. As the need to optimize this non-renewable research is realized, the use of more efficient machineries is needed in production. Industry research may also be made to determine what other types of industries could come up from the raw and processed marble materials available.

(11) EXPECTED OUTPUTS (6Ps)

Seven GCC grades from 7 quarry sites will be the product of the research. GCC graded products will also be turned out by the facility. An estimated 1,250 metric tons of GCC will be produced annually with an estimated value of PhP62M.

One research output on the Romblon GCC grades will be published in a reputable journal.

At least one patent will be coming out for a Romblon GCC.

One policy that may be proposed is on the local beneficiation and processing of Romblon marble wastes to enhance value addition right here at home.

Partnerships with marble industry players from project inception, implementation, and monitoring and evaluation will be made. Ways forward for the industry will be constantly pursued through industry dialogs.

(12) POTENTIAL OUTCOMES

Potential outcome for the project will be the value addition of marble wastes right at home. The rubbles brought out from the province has an estimated value of about PhP29M. GCC produced from the facility could have a value of PhP62M annually.

Other GCC-utilizing industries may put up shop in Romblon. As the demand is high for this product, more GCC milling plants may also be set up in Romblon

(13) POTENTIAL IMPACTS (2Is)

Social Impact

The facility will generate additional jobs for processing the marble wastes. The plant will be employing more workers in its operations. The repercussions of employment of workers to the society at large will be great. It would mean more stable families and communities, more taxpayers, and less dependency to the government.

Economic impact

Marble that are otherwise littering cutting plants and posing health risks and workplace hazards will be put to good use. The potential difference of PhP33M between marble rubbles sold outside and GCC produced in the province could substantially impact the local economy. Similar processing plants put up in the province will mean additional employment opportunities and a chance for a better life for Romblomanons working in the industry. Value addition in the province would mean that our resources have been utilized optimally for our province's benefit.

(14) TARGET BENEFICIARIES

Several target beneficiaries are identified: the marble cutting plant operators who will gain additional income while disposing of their wastes; the marble industry workers who will be employed in the marble milling operations and those who will benefit from a clean workplace due to proper waste disposal and utilization; families of workers who will enjoy the shared benefit of added family income; the local government unit that will benefit from added taxes due from added operations and potential businesses and industries to be put up; the community as a whole for the increased economic activity; and the RSU and researchers for being relevant while touching base with communities and industries in the pursuit of their research and extension activities.

(15) SUSTAINABILITY PLAN (if applicable)
Research activities will be sustained with more topics on marble waste utilization. GCC research will be enhanced further with product development and also with equipment development. GCC plant operations will also be maintained by the industry partners to make it more profitable and to totally eliminate the cutting plant wastes for the greater good.

(16) GENDER AND DEVELOPMENT (GAD) SCORE (refer to the attached GAD checklist) = 14.84

(17) LIMITATIONS OF THE PROJECT
The project may be limited by the available laboratories that may conduct the tests for the GCC. Some important parameters of the Romblon GCC may not be tested.

The project may also be limited by its power requirements.

(18) LIST OF RISKS AND ASSUMPTIONS RISK MANAGEMENT PLAN (List possible risks and assumptions in attaining target outputs or objectives.)
Tests for chemical analyses are done in a few laboratories and may be costly. Fund sources could buy the same equipment but it may be too costly. The cost, however, could be recouped through time if the laboratory equipment will be used regularly.

Power interruption in the marble milling facility could put a downtime on operations. This could be eliminated by having a standby generator, by operating in extra time when power is around or by getting only orders of about 75% plant capacity as long as the latter does not affect profitability.

(14) LITERATURE CITED

British Calcium Carbonates Federation https://calcium-carbonate.org.uk/calcium-carbonate/caco3.applications

Calcium carbonate of Kenya https://calciumcarbonate.co.ke/calciumcarbonate/

Castillon, K.M., Gaño, S., Macabasag, C & Mendoza, M.G. (2018). Effects of Different Levels of Marble Dust as Cement Replacement in the Physical and Mechanical Properties of Concrete Hollow Blocks. *Romblon State University.*

Evangelista, S., Viccione, G., & Siani, O. (2019). A new cost effective, long life and low resistance filter cartridge for water treatment. *Journal of water process engineering*, *27*, 1-14.

Hebatalrahman, A., 2011. Feasibility study of industrial unit for preparation and recycling of marble and granite wastes. Report and Opinion 2011; 3(12): 59-67. ISSN: 1553-9873.

Huber Carbonates https://hubermaterials.com>products

Mahumapelo, N.P., Magaseng C. 2014. Beneficiation of marble from Griekwastad, Northern Cape Province. Journal of the Southern African Institute of Mining and Mettalurgy. Vol. 114 n.11. Johannesburg.

(20) PERSONNEL REQUIREMENT

Position	Percent Time Devoted to the Project	Responsibilities
1 project Coordinator	10%	Signatory to the MOA, ensures that project outcomes and impacts are met.
1 Project Leader	30%	Supervises the project ensures that project objectives are met
2 Project researchers	35%	Conducts the research component of the project.

(21) BUDGET BY IMPLEMENTING AGENCY

IMPLEMENTING AGENCY – DOST MIMAROPA	PS	MOOE	EO	Total
Year 1 (second semester 2023)			2,200,000.00	2,200,000.00
Year 2 (first semester 2024)	96,000.00	204,000.00		300,000.00
TOTAL				2,500,000.00
IMPLEMENTING AGENCY – RSU	**PS**	**MOOE**	**EO**	**Total**

Year 1 (second semester 2023)		200,000.00		200,000.00
Year 2 (first semester 2024)		200,000.00		200,000.00
TOTAL				400,000.00
IMPLEMENTING AGENCY – Marble Industry Players	**PS**	**MOOE**	**EO**	**Total**
Year 1 (second semester 2023)			2,500,000.00	2,500,000.00
Year 2 (first semester 2024)	200,000.00	100,000.00		300,000.00
TOTAL				2,800,000.00

(22) OTHER ONGOING PROJECTS BEING HANDLED BY THE PROJECT LEADER: 1 (number)

Title of the Project	**Funding Agency**	**Involvement in the Project**
Establishment of a Marble Processing School Factory	CHED	Project proponent, project implementor.

(23) OTHER SUPPORTING DOCUMENTS (Please refer to page 2 for the additional necessary documents.)

I hereby certify the truth of the foregoing and have no pending financial and/or technical obligations from the DOST and its attached Agencies. I further certify that the programs/projects being handled is within the prescribed number as stipulated in the DOST-GIA Guidelines. Any willful omission/false statement shall be a basis of disapproval and cancellation of the project.

	SUBMITTED BY (Project Leader)	**ENDORSED BY (Head of the Agency)**
Signature		
Printed Name	BILSHAN F. SERVAÑEZ, PhD	MERIAN P. CATAJAY-MANI, EdD, CESE
Designation/Title	Director, CiLearnED@RSU	University President
Date	February 20, 2023	February 20, 2023

Note: See guidelines/definitions at the back.

DOST Form 2 (for Basic/Applied Research)
DETAILED R & D PROJECT PROPOSAL

I. General Instruction: Submit through the DOST Project Management Information System (DPMIS), http://dpmis.dost.gov.ph, the detailed R&D proposal for the component project together with the detailed proposal of the whole Program, project workplan, line-item budget (LIB), 1-page curriculum vitae of the Project Leader, and Certificate of Incorporation or DTI Registration (if applicable) and other applicable supporting documents required under item II.23 below. Also, submit four (4) copies of the proposal together with its supporting documents. Use Arial font, 11 font size.

II. Operational Definition of Terms:

1. Title- the identification of the Program and the component projects.

Project- refers to the basic unit in the investigation of specific S&T problem/s with predetermined objective/s to be accomplished within a specific time frame.

Project Leader- refers to a project's principal researcher/implementer.

Project Duration- refers to the grant period or timeframe that covers the approved start and completion dates of the project, and the number of months the project will be implemented.

Implementing Agency- the primary organization involved in the execution of a program/project which can be a public or private entity

2. Cooperating Agency/ies- refers to the agency/ies that support/s the project by participating in its implementation as collaborator, co-grantor, committed adopter of resulting technology, or potential investor in technology development or through other similar means.

3. Site/s of Implementation- location/s where the project will be conducted. Indicate the barangay, municipality, district, province, region, and country.

4. Type of Research- indicates whether the project is basic or applied.
Basic research- is an experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular or specific application or use in view.
Applied research- is an investigation undertaken in order to utilize data/information gathered from fundamental/basic researches or to acquire new knowledge directed primarily towards a specific practical aim or objective with direct benefit to society.

5. R&D Priority Area and Program- based on the Harmonized National R&D Agenda 2017-2022, indicates which R&D agenda the project can be categorized in: Agriculture, Aquaculture and Natural Resources; Health; Industry, Energy, and Emerging Technology; Disaster Risk Reduction and Climate Change Adaptation; and Basic Research. Indicate also the specific Commodity/Sector, whether crops, livestock, forestry, agricultural resources or socio-economics; fisheries or aquatic resources; biotechnical, pharmaceutical, or health services; biotechnology, information technology, material science, photonics or space technology; industry, energy, utilities or infrastructure.

Sustainable Development Goal (SDG) Addressed- indicates which among the 17 SDGs adopted by the United Nations Members States are addressed by the project

6. Executive Summary- briefly discusses what the whole proposal is about

7. Introduction- a formally written declaration of the project and its idea and context to explain the goals and objectives to be reached and other relevant information that explains the need for the project and aims to describe the amount of work planned for implementation; refers to a simple explanation or depiction of the project that can be used as communication material.

7.1. Rationale- brief analysis of the problems identified related to the project
Significance- refers to the alignment to national S&T priorities, strategic relevance to national development and sensitivity to Philippine political context, culture, tradition and gender and development.

7.2. Scientific Basis- other scientific findings, conclusions or assumptions used as justification for the research
Theoretical Framework- the structure that summarizes concepts and theories that serve as basis for the data analysis and interpretation of the research data.

7.3. Objectives- statements of the general and specific purposes to address the problem areas of the project.

8. Review of Literature- refers to the following: (a) related researches that have been conducted, state-of-the-art or current technologies from which the project will take off; (b) scientific/technical merit; (c) results of related research conducted by the same Project Leader, if any; (d) Prior Art Search, and; (e) other relevant materials.

9. Methodology- discusses the following: (a) variables or parameters to be measured and evaluated or analyzed; (b) treatments to be used and their layout; (c) experimental procedures and design; (d) statistical analysis; (e) evaluation method and observations to be made, strategies for implementation (Conceptual/Analytical framework).

10. Technology Roadmap (if applicable)**-** a visual document that communicates the plan for technology. It is a flexible planning technique to support strategic and long-range planning by matching short- and long-term goals to specific technology solutions.

11. Expected Outputs (6Ps)- deliverables of the project based on the 6Ps metrics (Publication, Patent/Intellectual Property, Product, People Service, Place and Partnership, and Policy).

Publication- published aspect of the research, or the whole of it, in a scientific journal or conference proceeding for peer review, or in a popular form.
Patent/Intellectual Property- proprietary invention or scientific process for potential future profit.
Product- invention with a potential for commercialization.
People Service- people or groups of people, who receive technical knowledge and training.
Place and Partnership- linkage forged because of the study.
Policy- science-based policy crafted and adopted by the government or academe as a result of the study.

12. Potential Outcomes- refer to the result that the proponent hopes to deliver three (3) years after the successful completion of the project.

13. Potential Impacts

Social Impact- refers to the effect or influence of the project to the reinforcement of social ties and building of local communities.
Economic Impact- refers to the effect or influence of the project to the commercialization of its products and services, improvement of the competitiveness of the private sector, and local, regional, and national economic development.

14. Target Beneficiaries- refers to groups/persons who will be positively affected by the conduct of the project.

15. Sustainability plan- refers to the continuity of the project or how it shall be operated amidst financial, social, and environmental risks.

16. Gender and Development (GAD) Score- refers to the result of accomplishing GAD checklists (for project monitoring and evaluation/project management and implementation) to highlight the contribution of the project in the achievement of the objectives of Republic Act 7192, “Women in Development and Nation Building Act,” interpreted as gender-responsive, gender-sensitive, has promising GAD concepts, or GAD is invisible.

17. Limitations of the Project- refer to restrictions or constraints in the conduct of the project.

18. Risk- refers to an uncertain event or condition that its occurrence has a negative effect on the project.
Assumption- refers to an event or circumstance that its occurrence will lead to the success of the project.

19. Literature Cited- an alphabetical list of reference materials (books, journals and others) reviewed. Use standard system for citation.

20. Personnel Requirement- details on the position of personnel to be involved in the project, percent time devoted to the project, and responsibilities.

21. Budget By Implementing Agency- personnel services (PS), maintenance and other operating expenses (MOOE), and equipment outlay (EO) requirement of the project by implementing agency for Year 1 and for the whole duration of the project. Please refer to the DOST-GIA Guidelines for the details (Section IX.B of DOST Administrative Order (A.O.) 011, s. 2020).

a. **PS**- total requirement for wages, salaries, honoraria, additional hire and other personnel benefits.

b. **MOOE**- total requirement for supplies and materials, travel expenses, communication, and other services.

c. **EO**- total requirement for facilities and equipment needed by the Program.

22. Other Ongoing Projects Being Handled By the Project Leader- list of ongoing projects being handled by the Project Leader funded by the DOST-GIA Program and other sources, and the accompanying responsibilities relevant to the project.

23. Other supporting documents required- as stated in Section VII of DOST A.O. No. 011, Series of 2020 – Revised Guidelines for the Grants-in-Aid Program:

a. Detailed breakdown of the required fund assistance to indicate the counterpart of the proponent and other fund sources including letter/s of commitment from the implementing, collaborating and coordinating agency/entity/ies;[1]
b. A counterpart fund, in kind and/or in cash, shall be required from the implementing agency/entity as one of the application requirements. All projects must have a minimum of 15% counterpart contribution except for projects involving public good;[1]
c. Curriculum Vitae or Personal Data Sheet (PDS) of Project Leader and other co-researchers/implementers. The service record may be requested if needed;[1]
d. Clearance from the DOST or the Funding Agency (e.g., DOST Councils) on previously funded completed projects handled by the Project Leader;[1]
e. Approval from the institution's ethics review board for research involving human subjects or in the case of animal subjects, approval from the Bureau of Animal Industry (BAI) (for PCAARRD- and PCHRD-monitored projects);
f. Clearance from the DOST Biosafety Committee (DOST-BC) shall be required for research proposals involving the use of GMOs under contained use (i.e., experiments done in laboratories, screen house, green house). For projects other than contained use, they shall be referred to the appropriate agency. The DOST Sectoral Councils, after determination as to whether or not the proposal has biosafety implications, shall endorse the same to the DOST-BC in accordance with the prescribed format under Annex 3 of the Philippine Biosafety Guidelines for Contained Use of Genetically Modified Organisms (series of 2014) (if applicable); and
g. For the private non-profit/non-government/people's organizations and startups:
    i. Up-to-date Securities and Exchange Commission (SEC) registration, or Department of Trade and Industry (DTI) registration, or Cooperative Development Authority (CDA) registration certificate, or other authenticated copy of latest Articles of Cooperation and other related legal documents;
    ii. Co-signers Statement (if applicable);
    iii. Copy of latest Income Tax Return;
    iv. Mayor's permit where the business is located;
    v. Audited Financial Statements for the past three (3) years preceding the date of project implementation or in case of those with operation of less than 3 years, for the years in operation and proof of previous implementation of similar projects (or in the case of startups, at least for one (1) year);
    vi. Document showing that NGO/PO has equity to 20 percent of the total project cost, which shall be in the form of labor, land for the project site, facilities, equipment and the like, to be used in the project;
    vii. Disclosure of other related business, if any;
    viii. List and/or photographs of similar projects previously completed, if any, indicating the source of funds for implementation;
    ix. Sworn affidavit of secretary of the NGO/PO that none of its incorporators, organizers, directors or officers is an agent of or related by consanguinity or affinity up to the fourth civil degree to the official of the agency authorized to process and/or approved the proposed MOA, and release of funds;
h. For CSOs, compliance to regulations as required by the General Appropriations Act (GAA) pertaining to fund transfers to Civil Society Organizations (CSOs); and
i. For foundations, DOST certification as accredited by the Science and Technology Foundation Unit

[1] *required of all proposals*

III. Criteria for Evaluation:

A. Criteria for Evaluating Proposals

Criterion	Definition
Relevance or Significance	Aligned to national S&T priorities, strategic relevance to national development and sensitivity to Philippine political context, culture, tradition and gender and development
Technical / Scientific Merit	Sound scientific basis to generate new knowledge or apply existing knowledge in an innovative manner
Budget Appropriateness	The proposed budget is commensurate to the proposed work plan and deliverables.
Competence of Proponent	Proponent's expertise is relevant to the proposal and with proven competence to implement, manage and complete R&D programs/projects within the approved duration and budget.

B. Governing Council / Board and EXECOM's Evaluation Criteria

Criteria	Indicators	Raw Score
A. Soundness of Proposal (20%)	R&D addresses relevant sectoral need (applicable to pressing concern)	5
	Solution provided is most effective (compared to other proposed solutions)	5
	Proposed budget is reasonable (project is not expensive vis-a-vis output)	5
	Work plan is doable in a given timeframe	5
B. Suitability of Output (30%)	R&D output is cost-effective (cost is competitive in relation to new or existing products or process)	5
	Has identified partners to adopt the technology (with letter of support from the head of the company)	5
	Output can be commercialized (through an existing manufacturer, spin-off or start-up company)	5
	R&D utilization is timely (output should not be overtaken by other solutions)	5
C. Significance of Outcome (30%)	Economic: increase in productivity, increase in income, new jobs generated, high return of investment (ROI)	5
	Social: working partnerships established, training opportunities provided, policies adopted, increased access to basic services (i.e., food, health, education); political, cultural, gender sensitivity and inclusivity	5
	Environment: enhanced environmental health standards, no adverse effect to the environment	5
	Sustainability: sustainability mechanisms established in terms of institutional, financial and human resources capability (submission of a new proposal to sustain a completed or ongoing proposal does not constitute sustainability of the project)	5
D. Competence of Proponent (20%)	Proponent's expertise aligned with the proposal	5
	Collaboration with relevant agencies and/or industry partners	5
	Thorough understanding of the proposal's deliverables	5
	DOST has good experience with the proponent	5

C. Additional Criteria on Gender and Development (GAD)