DOST Form 2 (for Startups)

DETAILED RESEARCH & DEVELOPMENT PROJECT PROPOSAL

(1) PROJECT PROFILE

Program Title:

Project Title: Mining Technology Innovation for Sustainable Mining Communities: An Impact Assessment of the Community-led Integrated Non-Mercury, Non-Cyanide Gold Extraction Method (CLINN-GEM) in Davao and CARAGA Regions

Project Leader/Sex: Rowee Joy S. Decena, Female

Project Duration (number of months): 12 months
Project Start Date: January 2022
Project End Date: December 2022

Implementing Agency (Name of University-College-Institute, Department/Organization or Company): Davao de Oro State College

Address/Telephone/Fax/Email (Barangay, Municipality, District, Province, Region): P-10, Compostela, Compostela Valley

(2) COOPERATING AGENCY/IES (Name/s and Address/es)

DOST XI: Friendship and Dumanlas Rds, Bajada Flyover Davao City
DOST XIII: CSU Campus, Ampayon Butuan City
Provincial Government of Davao de Oro, Cabidianan, Nabunturan Davao de Oro

(3) SITE(S) OF IMPLEMENTATION

IMPLEMENTATION SITES NO.	COUNTRY	REGION	PROVINCE	DISTRICT	MUNICIPALITY	BARANGAY
1.	Philippines	XI	Davao De Oro	II	Nabunturan	Katipunan
2.	Philippines	XIII	Agusan del Norte	N/A	Cabadbaran	Del Pilar

(4) TYPE OF RESEARCH

_____ Pre-commercialization

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

_____ Agriculture, Aquatic and Natural Resources
Commodity: _____
_____ Health
Priority Topic: _____
_____ Industry, Energy and Emerging Technology
Sector: _____
_____ Disaster Risk Reduction and Climate Change Adaptation
___x__ Applied Research
Sector: _Small-Scale Mining Industry

Sustainable Development Goal (SDG) Addressed

SDG 1.No Poverty
SDG 5. Gender Equality
SDG 6. Clean Water and Sanitation
SDG 8. Decent Work and Economic Growth
SDG 9. Industry Innovation and Infrastructure
SDG 10.Reduced Inequalities
SDG 12. Responsible Consumption and Production
SDG 15.Life on Land
SDG 16. Peace, Justice, and Strong Institutions

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

This study will assess the status of the technology transfer and the impact of the CLINN-GEM technology. Further, this study will examine the transition process and the operations of the Integrated Gold-Copper Mineral Processing Pilot Plant established in Barangay Del Pilar,

Cabadbaran City (CARAGA), and, Barangay Katipunan, Nabunturan Davao de Oro (Davao Region) in Mindanao. Lastly, this study aims to develop sustainability and policy advocacy plans for CLINNGEM.

STARTUP BACKGROUND (Description of the startup and the founders, their product and value proposition, and the I.P. status and protection (if applicable))

In 2015, the University of the Philippines Department of Mining Metallurgical and Materials Engineering (UP DMMME) and Department of Science and Technology (DOST), through the BetterMine Program of the Environment and Infrastructure track of the Engineering Research and Development for Technology (ERDT) produced the Community-led Integrated Non-Cyanide, Non-Mercury Gold Extraction Method (CLINN – GEM) technology as an alternative method to amalgamation and cyanidation in the recovery of gold (DOST XI, 2015). This program led to establishing the Integrated Gold-Copper Mineral Processing Pilot Plant in the following four areas: 1) Sitio Basil, Barangay Gumatdang, Itogon Benguet in Cordillera Administrative Region (CAR); 2) Barangay Sta. Rosa Norte, Jose Panganiban, Camarines Norte (Bicol); 3) Barangay Del Pilar, Cabadbaran City (CARAGA); and, 4) Barangay Katipunan, Nabunturan Compostela Valley (Davao Region).

At present, all the mineral processing plants have been turned over to the respective stakeholders for operation.

(7) INTRODUCTION

(7.1) RATIONALE/SIGNIFICANCE

In 2015 the CLINN- GEM technology was pilot-tested through the establishment of the Integrated Gold-Copper Mineral Processing Pilot Plant in Sitio Basil, Barangay Gumatdang, Itogon Benguet in Cordillera Administrative Region (CAR), Barangay Sta. Rosa Norte, Jose Panganiban, Camarines Norte (Bicol), Barangay Del Pilar, Cabadbaran City (CARAGA) and, Barangay Katipunan, Nabunturan Compostela Valley (Davao Region).

As a technological innovation, the features of CLINN-GEM subscribe to the principles of responsible and sustainable mining, green mining, clean technology, and end-pipe technology. Its introduction brought about several changes in the physical, knowledge, and social realms of small-scale mineral processing. Also, it resulted in several changes in the community's economic, social, and environmental conditions.

The CLINN-GEM transition process follows a technology innovation cycle that starts with documenting what the people know about mineral processing and establishing methods to systematize the process (research and development) towards rolling it back to the people (adoption). However, the transition process was not an easy one. It was fraught with issues and faced several issues such as acceptability, project delays, information and communication gaps, and limited resources. Some of these issues have been resolved through proper communication and community engagement, but the others remain fully addressed. Meanwhile, technical, political, social, economic, and environmental risks must be addressed to ensure a successful transition.

At present, all integrated gold-copper mineral processing plants were turned over by UP to their respective recipients/ partner stakeholders for operation; thus, continuous monitoring and evaluation of the transition process is vital to direct future decisions to address the challenges and ensure a successful transition. Also, an impact assessment is necessary to trace the subsequent changes and impact of the CLINN-GEM. Lastly, it is best to learn from the people and use these experiences to design plans for their future. Thus, allowing them to participate in this study empowers them to achieve sustainable development.

(7.2) SCIENTIFIC BASIS/THEORETICAL FRAMEWORK

Figure 1. The conceptual framework for the impact assessment of CLINN-GEM towards achieving sustainability

Figure 1 above shows the basic concepts and proposed analytical framework of this study. The assessment towards sustainability will commence by describing the *Context* of the CLINN-GEM technology through its vision, mission, goals, and objectives. Then the analysis of the *Processes* to include but not be limited to project building, project implementation, stakeholder's participation, and operations of the integrated gold-copper mineral processing plants will follow. Also, the *Issues and Challenges* during the project implementation towards turnover will be discussed while CLINN-GEM's technical, social, economic, and environmental *impacts* will be assessed too.

Firstly, the technical efficiency of CLINN-GEM will be assessed through a parallel-testing between CLINN-GEM and the traditional gold extraction methods such as amalgamation and cyanidation with operation cost, environmental cost, operation time, and gold recovery as parameters of the testing. Secondly, non-discrimination practices, equal access to the technology regardless of gender, inclusive participation in stakeholders' decision-making, acceptability of the technology, and observance to health and safety standards among miners and workers of the integrated gold-copper mineral processing plant will be considered as social indicators. Meanwhile, an increase in income, opportunities for new jobs, infrastructure development, and other economic benefits that may surface during the data gathering will be considered economic indicators. Lastly, use of chemicals, waste reduction, recycling, and reuse features and facilities of CLINN-GEM, wastewater treatment, the water quality of nearest bodies of water, environmental conservation initiatives, and environmental risks such as noise, air quality and waste disposal will be considered as environmental indicators. The lessons that will be learned from these experiences will be used by the stakeholders to draft a sustainability plan and a policy advocacy agenda for the nationwide adoption of CLINN-GEM.

(7.3) OBJECTIVES

General: This study aims to assess the status, development, and impact of the operations of integrated gold-copper mineral processing plants in CARAGA and Davao Regions

Specific:

a) To assess the efficiency of the technology in terms of operating cost, operating time, environmental/detoxification cost, and overall gold recovery;
b) To evaluate social, economic, and environmental impacts of the integrated gold-copper mineral processing plants;
c) To draw lessons from the assessment, suggest and design a policy advocacy agenda for utilizing and operating the integrated gold-copper mineral processing plants.

(8) REVIEW OF LITERATURE

For startup proposals, the previous R&D conducted related to the proposed technology (product/process/service), and the status of the intellectual property (I.P.) protection of the proposed technology should be included. Also, include a background on the development of the technology (*i.e.,* the evolution of the startup, prototype, first test, first sale).

The BetterMine program of the Environment and Infrastructure track of the Engineering Research and Development for Technology (ERDT) of DOST-Philippine Council for Industry, Energy and Emerging Technology for Research and Development (DOST-PCIEERD) and the Department of Mining, Metallurgical and Materials Engineering (DMMME) of the University of the Philippines Diliman was able to establish an efficient and environmentally friendly process to separate gold and copper concentrates for various gold ores. On the other hand, the Mineral Extraction with Responsibility for Sustainability (MinERS) Program introduced non-hazardous processes to extract gold metal from high-valued concentrates and integrated waste treatment and disposal systems. These projects produced the Community-led Integrated Non-Cyanide, Non-Mercury Gold Extraction Method (CLINN – GEM) technology as an alternative method to amalgamation and cyanidation in the recovery of gold (DOST XI, 2015). The CLINN-GEM technology was pilot tested by establishing the Integrated Gold-Copper Mineral Processing Pilot Plant in the following four areas: 1) Sitio Basil, Barangay Gumatdang, Itogon Benguet in Cordillera Administrative Region (CAR); 2) Barangay Sta. Project C entitled " Copper floatation Technology for Small Scale Mining and Project D entitled, "Alternative Methods to Cyanidation and Amalgamation in the Processing of Gold were proven successful and showed remarkable promise. Rosa Norte, Jose Panganiban, Camarines Norte (Bicol); 3) Barangay Del Pilar, Cabadbaran City (CARAGA); and, 4) Barangay Katipunan, Nabunturan Compostela Valley (Davao Region).

The proponent's dissertation entitled "Mining Technological transition: Exploring Processes and Pathways towards Sustainable development in Small-scale Mining Communities" documented the Comvalenos experiences with establishing and field testing the Integrated Gold-Copper Mineral Processing Pilot Plant in Barangay Katipunan, Nabunturan Davao De Oro. She found out that the CLINN-GEM technology is a synthesis and systematized articulation of local knowledge on mineral processing which aims to address the adverse impacts of mineral processing using traditional hazardous and low-end technologies in small-scale mining. Moreover, she expounded that the developers of the technology roll it back to the people for them to use to maximize their resources to attain good life leading towards sustainability.

Also, she argued that as technological innovation, the features of CLINN-GEM subscribe to the principles of responsible and sustainable mining, green mining, clean technology, and end-pipe technology, and its introduction brought about several changes in the physical, knowledge, and social realms of small-scale mineral processing. Also, it resulted in several changes in the community's economic, social, and environmental conditions.

However, she claimed that the transition process from pre-deployment to turnover of the integrated gold-copper mineral processing plants was not easy. It was fraught with issues and faced several issues such as acceptability, project delays, information and communication gaps, and limited resources. Some of these issues have been resolved through proper communication and community engagement, but the others remain fully addressed. Meanwhile, technical, political, social, economic, and environmental risks must be addressed to ensure a successful transition.

Lastly, she admitted that time was one of her limitations. Thus, she recommended monitoring and evaluation of the impact of the operations of the integrated gold-copper mineral processing plants. Also, she recommended further increasing the scope of the study from single to multiple case studies to include the other integrated gold-copper mineral processing plants established in Itogon, Jose Panganiban, and Cabadbaran.

(9) MARKETING AND COMMERCIAL VIABILITY (For startup proposals) (Details such as a) competitors (Include in the proposal a competitive advantage analysis using a comparative advantage table.); b) similarities, differences, and advantages of the product compared to its competitors; c) production requirements and its corresponding values; d) details of Intellectual Property Rights (IPR) and license applications; e) raw materials and suppliers; f) target and current areas of distribution; g) target market and beneficiaries; h) description and size of the target market; i) ideal forecast of the demand and sales; j) limiting factors, and; k) marketing strategies and pricing.)

The integrated gold-copper mineral processing plants were established in selected mining regions in the Philippines for pilot testing. Once its efficiency is proven, a national policy for adoption and implementation is very viable.

(10) METHODOLOGY

A. Research Design

This participatory action research will be descriptive, and the researcher will employ a multiple case study approach. Also, the researcher will adopt a mixed-method approach to data gathering and analysis. The study will draw on the strengths of both the quantitative and qualitative approaches in discussing the complexity of the research topic.

B. Case Selection Criteria and Location

Among the four mining communities where the integrated gold-copper mineral processing plant was established, two communities were selected as the study's locale, which will serve as sample cases for investigation. These communities are in Barangay Del Pilar, Cabadbaran City (CARAGA) and, Barangay Katipunan, Nabunturan Compostela Valley (Davao Region). These communities were selected based on the following criteria:

1. Place-based. The communities are the sites of the mineral processing plant, which apply the CLINN-GEM technology in its operations.

2. Sustainability Transition. The communities or a significant subset of the communities, headed by the barangay local government officials, are trying to change the communities towards sustainability.

3. A mining community. The communities or a significant subset of the communities are, directly and indirectly, engaged in mining as a form of livelihood.

4. Interest and participation. The population of the communities was actively engaged in the program. Furthermore, it has an interest and willingness to participate in the research.

5. Availability of baseline data. The community has been included in the baseline studies conducted by the researcher.

6. Transition date. There should be data available since 2015, the implementation year of the project entitled "Field Testing of the Integrated Gold-Copper Mineral Processing Pilot Plant in Compostela Valley."

C. Participants of the Study

The participants of the study will include the operations group, project staff of the field-testing project, representatives from the local government units, representatives of the mining cooperatives, and representatives of non-government organizations whose advocacies are related to mining. They will be classified and selected through criterion sampling, which considered the following:

1. Representation of women, queer and other genders.
2. Knowledge of direct or indirect involvement in the CLINN-GEM Project;
3. Availability during data gathering;
4. Representation from the different sectors and stakeholders; and,
5. Willingness to be part of the research.

D. Data Gathering Methods and Procedures

Data gathering and analysis of this research will be divided into three interrelated phases: the preparatory phase, data gathering phase, and data analysis phase. Multiple data gathering methods will be used in the different phases.

I. Preparatory Phase

The activities during this phase will include initial investigation/scoping, consultations, and negotiations. An initial investigation will be conducted will be to identify the participants and partner agencies of the study. Once the participants are identified, consultations and negotiations will be conducted with the different partners. Along with these activities is the

presentation of the research objectives and research methodology. Also, the activity will include the setting of expectations for the study. Negotiations will be conducted with the arrangement of work schedules and the research timeline.

Before conducting workshops and focus group discussions, documents review and key informant interviews will be conducted to gather initial data on the profile of the case communities, identify different innovations and initiatives, actors or agents, existing practices, parallel testing results, and other necessary data.

II. Data Gathering Phase

The researcher will employ a participatory process-tracing method as an overall data gathering method of the study. The process-tracing method with be employed with the following activities:

Field Experiments. Parallel testing comparing CLINN-GEM and the traditional gold extraction methods such as amalgamation and cyanidation will be conducted in both sites. The testing parameters will include the operation cost, environmental cost, operation time, and gold recovery. During the field testing, partners - small-scale mining cooperatives and groups will be asked to provide ores for processing. Also, air pollution and water analysis of wastewater and nearby bodies will be conducted. The parameters for air pollution analysis will be based on the National Emission Standards for source Specific Air Pollutants from Industrial Sources/Operations and the National Ambiant Air Quality Standards for Source Specific Air Pollutants from Industrial Sources/ Operations as specified in Rule XXV! Of the IRR of RA 8749. Meanwhile, the water quality analysis parameters will include the physical and chemical characters of the samples using DENR Administrative Order No. 2016-08 or the Water Quality Guidelines and General Effluent Standards of 2016.

Structured Learning Exercises. In the study, there will be a series of workshops and learning exercises for the research participants. The workshops conducted are community analysis, stakeholder analysis, sustainability, and policy advocacy planning. The participants for these exercises will include the operations group, project staff of the field-testing project, representatives from the local government units, and representatives of the mining cooperatives.

Focus Group Discussion. Focus group discussions will be conducted after the workshops. The group discussions aim to supplement the data provided by the participants and validate or clarify information gathered during the workshops.

Guided Tour. The mineral processing plant's field visit and the tour will be conducted to validate information gathered from document reviews, structured learning exercises, and focused group discussions. Clarifications were specially made about the physical attributes and actual activities of the mineral processing plant.

III. Data Analysis Phase

The data derived from structured learning exercises and group discussions will be transcribed, clustered, and organized thematic. In contrast, the data from the documentary analysis and workshops will be organized and systematized. Once ready, the data will be analyzed using content analysis to systematically break down, categorize, describe and find patterns in the data. This process will be supported with pattern matching and explanation building as analytic techniques, case descriptions will be made, and rival explanations will be examined. Another analytical tool that will be used in this study will be the logic model analysis. The logic model will analyze cause and effect patterns and match empirically observed events to theoretically predicted outcomes.

On the other hand, the data derived from the field experiments will be analyzed using appropriate tools. For example, water samples from wastewater treatment and nearby bodies of water will be analyzed using physical and chemical analysis. Once ready, results will be presented to the participants for validation. Validated results will be used as a basis in developing a sustainability plan and a policy advocacy agenda.

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

(12) EXPECTED OUTPUTS (6Ps)

a) At least one (1) published article in a Scopus or ISI indexed journal on assessing the status and impact of the integrated gold-copper mineral processing plant in CARAGA and Davao Regions.
b) At least one (1) research presented in a national or an international conference or for a.
c) A sustainability plan for the integrated gold-copper mineral processing plants operations, its users, operators, and the mining communities.
d) A policy advocacy agenda for the utilization and operation of the integrated gold-copper mineral processing plants.

(13) POTENTIAL OUTCOMES

a) A national policy for the utilization and operation of the integrated gold-copper mineral processing plants.
b) Optimal and sustainable use of the integrated gold-copper mineral processing plants.

(14) POTENTIAL IMPACTS (2Is)

a) The study will increase awareness of the technology developers, partner agencies, and small-scale mining communities on the impact of the integrated gold-copper mineral processing plant.
b) The study will provide the basis for the economic viability of the integrated gold-copper mineral processing plant and the environmental sustainability of the small-scale mining communities.

(15) TARGET BENEFICIARIES

a) National level: Small-scale mining industry and National government funding agencies such as DOST, academic/research institutions.
b) Local-level: local government units, small-scale mining communities, operators, and miner's associations

(16) SUSTAINABILITY PLAN

Despite identified risks and limitations, the researcher pledges to exhaust all means to gather all data needed for the study religiously. Alternative data gathering techniques such as virtual meetings and documents review will be conducted to ensure the quality of the research output.

(17) GENDER AND DEVELOPMENT (GAD) SCORE (refer to the attached GAD checklist)

19.6 (Please see attached GAD Checklist)

(18) LIMITATIONS OF THE PROJECT

The projects limitations will include the following:

a) LGUs of mining communities may restrict or prohibit specific data gathering activities because of the pandemic and the community quarantine classifications status of the mining communities where the integrated gold-copper mineral processing plants were located.
b) Participation of the respondents may be limited because of the health protocols.
c) Conduct of the Field-testing and other technical evaluation activities will be dependent on the availability and ores and the operation of the integrated gold-copper mineral processing plants.
d) The researcher cannot travel and gather data needed for the study physically.
e) Non -participation of the possible respondents due to health protocols, restrictions, and other reasons.

(19) LIST OF RISKS AND ASSUMPTIONS RISK MANAGEMENT PLAN (List possible risks and assumptions in attaining target outputs or objectives.)

Please see attached file.

(20) LITERATURE CITED

1. Alternative Methods to Cyanidation and Amalgamation in the Recovery of Philippine Gold, 2013 (ERDT BetterMine Project D)
2. Better Mine Project C and D Report., " Integrated Gold-Copper Minerals Processing Pilot Plant"
3. Flotation Technology for Small Scale Mining industry, 2012 (ERDT BetterMine Project C)
4. Decena (2020).Mining Technological Mining Technological Transition: Exploring Processes And Pathways Towards Sustainable Development In Small-Scale Mining Communities. Unpublished Dissertation, UP CSWCD
5. DOST XI. (2015). DOST Form No. 2B Detailed Proposal For Research and Development ERDT: Field Testing of the Integrated Gold-Copper Mineral Processing Pilot Plant in the Regions (Compostela Valley): Detailed Proposal.
6. Mineral Extraction with Responsibility for Sustainability (MinERS) Program

(21) PERSONNEL REQUIREMENT

Position	Percent Time Devoted to the Project	Responsibilities
Project Leader I	98%	The one who directly plans, organizes, supervises, and conducts the implementation of the project/study.
2 Project Staff (Level 3)	95%	The one who works and supports the project leader. They shall assist in data gathering, meetings, and other activities related to the project/study.

(22) BUDGET BY IMPLEMENTING AGENCY

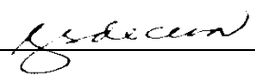
IMPLEMENTING AGENCY	PS	MOOE	EO	Total
Year 1	285,600.00	405,000.00	150,000.00	840,600.00
Year 2				
Yearn				
TOTAL	285,600.00	405,000.00	150,000.00	840,600.00

(23) OTHER ONGOING PROJECTS BEING HANDLED BY THE PROJECT LEADER: _____ (number)

Title of the Project	Funding Agency	Involvement in the Project
N/A		
N/A		
N/A		

(24) 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 are within the prescribed number 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	**ROWEE JOY S. DECENA, DSD**	
Designation/Title	**Assistant Prof. II**	
Date	**August 17, 2021**	

Note: See guidelines/definitions at the back.

DOST Form 2 (for Startups)
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 work plan, 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.24 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

Pre-commercialization- is a process that bridges R&D and commercialization which includes activities that lead to the creation or validation of the business model for the commercialization of a product/service. Examples of activities include incubation, mentoring, business support program, capacity building, fabrication support, promotion, market validation, optimization of processes, acquisition of production capabilities, research on manufacturability of products/optimization of value chains, advisory, legal and expert support, and use of research/incubation facilities, among others. For ready to scale startups, pre-commercialization shall include optimizing scale-up operations to serve local markets, roll out of initial services, expansion of protection in other countries, and extensive marketing in preparation for investment offerings in the future.

a. **Startup**- any person or registered entity engaged in the Philippines which aims to develop an innovative product, process, or business model.

b. **Spin-off firm or company**- refers to a juridical entity that is an independent business technology taker with a separate legal personality from the GFA, RDI and researcher created through the initiative of the researcher-employee who generated the technology.

5. R&D Priority Area and Program- based on the Harmonized National R&D Agenda 2017-2022, indicate 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

Startup Background- description of the startup and the founders, their product and value proposition, and the I.P. status and protection (if applicable)

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 the 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. For startup proposals, results of previous R&D conducted related to the proposed technology (product/process/service) and the status of the intellectual property (I.P.) protection of the proposed technology should be included. Also, include a background on the development of the technology (*i.e.,* evolution of the startup, first prototype, first test, first sale) as well as technology gaps between R&D and commercialization. If applicable, cite the Freedom to Operates (FTO) result to ensure that the use and/or commercialization of a certain technology faces no risk of infringing any related I.P. registrations and applications.

9. Marketing and Commercial Viability- for startup proposals, to include details such as: a) competitors (Include in the proposal a competitive advantage analysis using a comparative advantage table.); b) similarities, differences, and advantages of the product compared to its competitors; c) production requirements and its corresponding values; d) details of Intellectual Property Rights (IPR) and license applications; e) raw materials and suppliers; f) target and current areas of distribution; g) target market and beneficiaries; h) description and size of the target market; i) ideal forecast of the demand and sales; j) limiting factors, and; k) marketing strategies and pricing.)

10. 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).

11. 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.

12. 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.

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

14. 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.

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

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

17. 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.

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

19. 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.

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

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

22. Budget By Implementing Agency- personnel services (P.S.), maintenance and other operating expenses (MOOE), and equipment outlay (E.O.) 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. **P**.S.- 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. **E**.O.- total requirement for facilities and equipment needed by the program.

23. 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.

24. Other supporting documents required- as stated in Section VII of Administrative Order 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, greenhouse). 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 foundation, 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 startup 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)