DOST Form 2 (for Basic/Applied Research)

DETAILED RESEARCH & DEVELOPMENT PROJECT PROPOSAL

(1) PROJECT PROFILE

Program Title: Grants-in-Aid
Project Title: Development of Thermally-Processed Rice-Based Products for the Mobile Modular Food Processing Facility - Retort Module
Project Leader/Sex: Jesse M. Pine/ M
Project Duration (number of months): 12 months
Project Start Date: January 2025
Project End Date: December 2025
Implementing Agency (Name of University-College-Institute, Department/Organization or Company):
Mindoro State University
Address/Telephone/Fax/Email (Barangay, Municipality, District, Province, Region): Brgy. Masipit, Calapan City, Oriental Mindoro, MIMAROPA

(2) COOPERATING AGENCY/IES (Name/s and Address/es)
DOST-PSTO-Oriental Mindoro, Brgy. Sta Isabel, Calapan City, Oriental Mindoro

(3) SITE(S) OF IMPLEMENTATION

IMPLEMENTATION SITES NO.	COUNTRY	REGION	PROVINCE	DISTRICT	MUNICIPALITY	BARANGAY
1.	Philippines	MIMAROPA	Oriental Mindoro	1st	Calapan City	Masipit
2.	Philippines	MIMAROPA	Oriental Mindoro	1st	Victoria	Merit

(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: Food and Nutrition Security
_____ Disaster Risk Reduction and Climate Change Adaptation
_____ Basic Research
Sector: _____

Sustainable Development Goal (SDG) Addressed

SDG 2 – Zero Hunger;
SDG 3 – Good health and Well-being;
SDG 12 – Responsible Consumption and Production

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

The "Development of Ready-to-Eat Rice-Based Meals Utilizing Mobile Processing Facility-Water Retort Module" aims to provide value-addition services for the local farmers in the region, particularly in the province of Oriental Mindoro, while simultaneously providing consumers with nutritious, convenient, and locally sourced food options.

In 2020, the Department of Science and Technology - Industrial Technology Development Institute (DOST-ITDI), in partnership with DOST-MIMAROPA and the Provincial Government of Oriental Mindoro-Provincial Agriculture Office (PGOM-PAgO), collaborated on the development of the Mobile Modular Food Processing Facility-Water Retort Module. A water retort is a food processing equipment that applies heat treatment to produce shelf-stable products.

Since rice is one of the top commodities in the province, the project will prioritize its processing into ready-to-eat products. RTE arroz caldo – squid, beef with mushroom, mussels variant will be developed. This research and development project will take place in the Food Innovation Center-MIMAROPA. Once RTE arroz caldo is standardized and tested, mass production will follow in the MMFPF-Water Retort Module.

RTE arroz caldo will be integrated into the market as an emergency food reserve and distributed by the LGUs during calamities or by other NGAs and CSOs in their respective feeding programs.

(7) INTRODUCTION

The agricultural sector in the region faces a recurrent challenge—periodic surpluses of raw materials resulting from the overproduction of fresh produce and fluctuating prices. These surpluses necessitate additional processing steps to cut back food wastage and address the decline in prices.

In response to these challenges, the Mobile Modular Food Processing Facility-Retort Module (MMFPF-Retort Module) was established. This initiative will be beneficial in mitigating food wastage while facilitating the conversion of surplus into innovative products.

Rice is one of the region's abundant staples. The application of the retort technology can transform ordinary rice into shelf-stable, ready-to-eat products such as porridge. Such products prove invaluable as emergency food during calamities or in supplementary feeding programs conducted by Local Government Units (LGUs), National Government Agencies (NGAs), and Civil Society Organizations (CSOs).

The presence of water retort equipment in the regional FIC provides a competitive advantage. Harnessing this equipment for product development and mass production is economically favorable for farmers, allowing them to circumvent post-harvest losses and secure a stable income. Moreover, the extended shelf- life of retorted products allows them to get integrated into a broader value chain.

Given the goals of the MMFPF, it is imperative to undertake research and development (R&D) activities. These activities will culminate in the creation of food products specifically tailored for mass production, optimizing resource utilization, and reinforcing the facility's capacity to offer secure, sustainable, and accessible food solutions to the MIMAROPA region.

The theoretical framework underpinning this endeavor draws strength from the region's abundant raw materials, existing food processing technologies, and facilities. These elements form the bedrock for conducting R&D activities encompassing product formulation, process standardization, and rigorous laboratory analyses.

These measures ensure the quality, safety, and adherence to regulatory standards of the developed product. The anticipated outcome of the project is the region's enhanced capacity to undertake mass production of RTE arroz caldo, protected by a Utility Model application.

The R&D will be undertaken by PSTO-Oriental Mindoro personnel who are trained and competent to handle product development activities through thermal processing techniques as required by the project.

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

MIMAROPA region is shifting towards sustainable and adaptable processing through cutting-edge technologies. This is significant given the abundant agricultural commodities in the region. Oriental Mindoro, for example, is recognized as the "Food Basket of the Region," the "Rice Granary," and the "Banana King" of MIMAROPA, and even gained the title of "Calamansi King" of the Philippines.

However, the agricultural sector experienced a surplus of raw materials from time to time given by the overproduction of fresh produce thus resulting to low prices which redound to farmers' persistent woes. This requires additional processing steps to mitigate food wastage, given the susceptibility of these materials to spoilage.

To address these challenges, the MMFPF-Retort Module was established. This pioneering approach promises numerous advantages, including efficient sterilization and extended shelf-life for food products, thus mitigating spoilage and food waste. Additionally, it empowers the conversion of surplus agricultural resources into innovative and value-added food products.

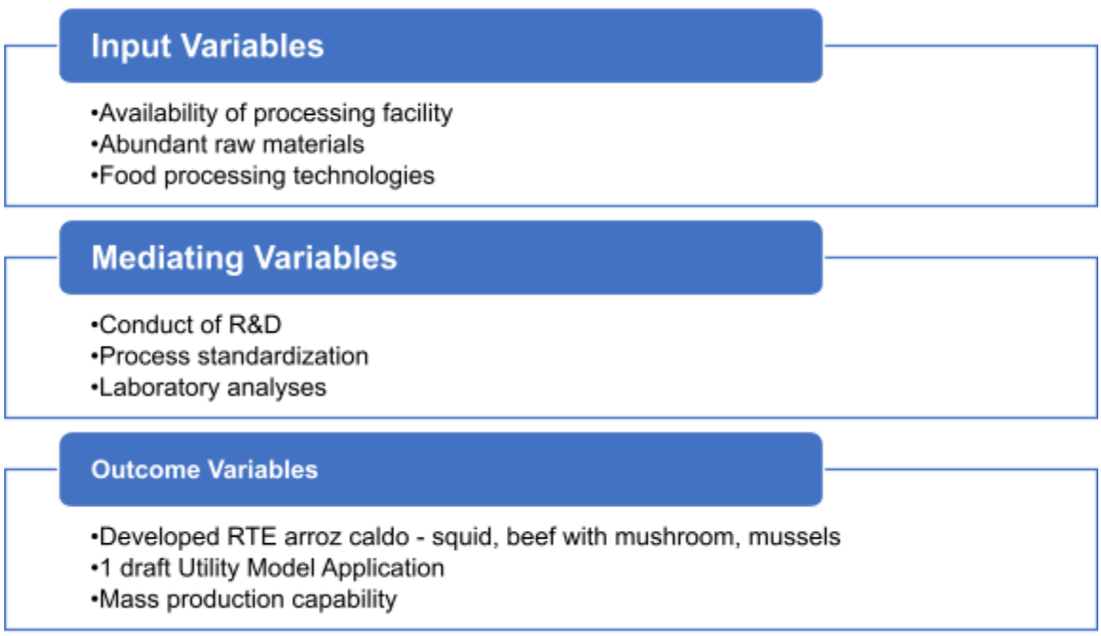
Rice, being abundant in the province, and a staple food among Filipinos, could undergo processing. The application of the water retort technology (thermal processing) could turn the usual rice menu into a product with a longer and stable shelf-life like ready-to-eat porridge which could be used as emergency food during calamities, or in supplementary feeding programs conducted by LGUs, NGOs, and CSOs.

The water retort in the region offers a competitive advantage. Utilizing the equipment through product development and mass production is advantageous for the farmers to avoid post-harvest losses, ensuring a stable income. The shelf-life of retorted products renders them stable and ready for integration into the value chain for broader distribution.

While there are existing products with similar concepts, such as the DOST-ITDI-developed RTE Chicken Arroz caldo, the proposal differs in that it aims to develop other variants utilizing locally available resources in the region such as rice, squid, beef, and mushroom. On the other hand, there are commercially available arroz caldo in the market but not in ready-to-eat form, it is either ready to cook or requires hot water for preparation. The project aims to create a product in RTE form which is easier, and no preparations are needed making it a recommendable food during calamities or emergencies.

The emphasis on research and development activities is a key aspect of ensuring the long-term success of the MMFPF-Retort Module. By continuously optimizing resource utilization and creating food products specifically designed for mass production, the facility can strengthen its capacity to provide secure, sustainable, and accessible food solutions to the MIMAROPA region. This aligns with the regional goals and reflects a commitment to address immediate challenges while building a resilient and thriving agricultural ecosystem.

(7.2) SCIENTIFIC BASIS/THEORETICAL FRAMEWORK



The theoretical framework is rooted in the abundant raw materials, existing food processing technologies, and facilities. These serve as the foundation for the conduct of R&D for product formulation, and process standardization followed by laboratory analyses to ensure the quality, safety, and adherence to set regulatory standards of the developed product. It is expected that at the end of the project, the region will be capable of conducting mass production of RTE arroz caldo with a Utility Model application.

(7.3) OBJECTIVES

General: This project aims to develop thermally-processed rice-based products optimized for the Mobile Modular Food Processing Facility - Retort Module.

Specific:

1. To conduct process optimization, product formulation, and standardization of ready-to-eat arroz caldo - squid, beef with mushroom, and mussels, using the water retort installed at the FIC-MIMAROPA;
2. To acquire necessary equipment, tools, and supplies for the conduct of the R&D;
3. To conduct laboratory analyses to determine the end-product quality and safety; and
4. To conduct pre- and post-evaluation of the project to determine the impact of technical assistance.

(8) REVIEW OF LITERATURE

Agricultural Surplus and Food Waste

Agricultural surpluses and food waste constitute pressing global issues with significant economic and environmental implications. These challenges occur in regions characterized by seasonal variations in crop production. The surplus crops often go unharvested or unsold, resulting in significant financial losses for the farmers (Gustavsson et al.,2011). This issue not only affects individual livelihood but also impacts the broader agricultural sector, making agriculture less economically sustainable.

The environmental consequences of agricultural surplus and food waste are substantial. The resources invested in cultivating surplus crops will be wasted, and the decomposition of organic food waste in landfills produces greenhouse gases contributing to climate change. Therefore, addressing food waste is tantamount to reducing the environmental footprint of agriculture.

Technological Advances in Mobile Food Processing

The development of the Mobile Modular Food Processing Facility with a Retort Module represents a substantial technological advancement in food processing (Balasubramaniam et al., 2018). Mobile processing units offer the advantage of bringing processing capabilities closer to agricultural areas, reducing post-harvest losses, and enhancing the overall efficiency of the food supply chain (Mazhar and Mistry, 2016). This innovation holds great promise for optimizing resource utilization and reinforcing the capacity to offer secure, sustainable, and accessible food solutions.

Mobile Processing Facilities

Mobile processing facilities are recognized tools to aid in food loss reduction and income generation. Countries like India and Kenya studied the potential of these units to bring food processing capabilities closer to agricultural areas (FAO, 2019). These facilities offer adaptability and cost-effectiveness, making them suitable for regions with limited infrastructure.

Ready-to-Eat Meals and Consumer Trends

The global demand for ready-to-eat meals is growing rapidly with consumers prioritizing nutrition, flavor, and convenience (Mintel, 2021). This presents significant opportunities for the development of ready-to-eat meals, particularly those inspired by local and traditional cuisines like "arroz caldo." Such meals resonate with consumers seeking authentic cuisines and reflect the growing interest in diverse food options from around the world.

Developing ready-to-eat meals that cater to these consumer preferences not only satisfies market demand but also contributes to economic growth, especially when utilizing locally sourced ingredients and traditional recipes.

Food Product Development and Innovation

Food product development encompasses various stages, including concept development, formulation, sensory analysis, and quality assurance (Heldman & Hartel, 2019). Innovation in food processing such as water retort technologies is significant in leveraging food safety, extending shelf-life, and preserving nutritional quality (Zhou et al., 2018). This innovation is crucial for reducing food losses and ensuring the availability of safe and nutritious food products.

Incorporating innovative food processing technologies not only reduces waste but also supports the creation of high-quality food products that meet consumer expectations for safety, flavor, and nutrition. These innovations are indispensable in the battle against food loss.

Water Retort Processing

Water retort processing is a well-established thermal preservation method to produce shelf-stable, ready-to-eat (RTE) products (Smith et al., 2018). The technique involves sealing food products in airtight containers and subjecting them to high-temperature steam treatment, effectively eliminating harmful microorganisms and enzymes (Balasubramaniam et al., 2018). The resulting RTE products have an extended shelf-life, making them convenient and safe for consumers.

The equipment applies principles of heat sterilization to achieve the preservation of food products (Heldman & Hartel, 2019). The process involves several key steps: container sealing, and application of heat to destroy bacteria, yeasts, molds, and enzymes that could cause spoilage; cooling to prevent overcooking and maintain product quality; and shelf stability so the product can be stored at room temperature for an extended period (Balasubramaniam et al., 2018).

Water retort processing is widely applicable in the development of RTE products, spanning various categories such as soups and stews, and sauces, complete RTE meals, baby food, and emergency and military rations (Smith et al., 2018). These products offer consumers convenience, extended shelf-life, and maintained nutritional quality, satisfying preferences for safe, flavorful, and easy-to-prepare meals.

Cultural Preservation through Food Processing

The preservation of traditional cuisines is essential for cultural heritage. UNESCO recognizes the cultural significance of traditional meals and their roles in preserving cultural identity (UNESCO, 2021). Local food products that showcase cultural heritage can attract tourists and support efforts to safeguard culinary traditions. This not only enriches the local cultural experience but also promotes cultural exchange and understanding.

Advantages and Positive Impact of Value Addition in Agriculture

There are numerous advantages and positive impacts of value addition that extend beyond individual farmers to benefit entire communities and economies. One of the primary benefits of value addition is the potential for increased income generation for farmers by fetching higher prices of goods (Swinnen et al., 2019).

Value addition encourages farmers to diversify their product range (Reardon et al., 2019). Instead of relying solely on raw commodity production, it reduces income volatility, providing a more stable profit for farmers. Additionally, it opens opportunities for farmers to cater to diverse consumer preferences.
According to Jayne et al. (2019), value-added products, such as fortified foods or processed goods with extended shelf-life, can be stored and distributed more effectively. This ensures a more stable food supply, even during periods of scarcity, contributing to overall food security.

The incorporation of surplus rice into this project aligns with sustainable agricultural practices, as it transforms excess raw materials into value-added food products. The potential of this project is to address various challenges, including the development of convenient RTE meals, reducing food wastage, and contributing to local food security and emergency preparedness in the region. The synthesis of historical knowledge, technological innovations, and consumer preferences provides a robust foundation for the proposed research and development activities.

(9) METHODOLOGY

Upon approval of the project, Mindoro State University, with the assistance of PSTO-Oriental Mindoro, will facilitate the procurement of raw and packaging materials, equipment, and analytical tools to lead, conduct, and manage the R&D project implementation. FIC-MIMAROPA will be tapped to provide technical assistance and use its food processing facility during the entire duration of the study.

Representatives of PSTO-Oriental Mindoro and FIC-MIMAROPA staff will compose the Management Team (PMT) which will oversee and ensure the successful implementation of the project.

Raw materials will be procured within the province, while packaging materials will be from a known supplier based in Manila as well as the analytical devices that will be purchased for the study.

Product development will be done in small batches during the initial stage of formulation. The samples will then undergo sensory analyses by trained panels from TWG and SUC. After the determination of the most acceptable formulations, the team will then proceed to process standardization using the water retort installed at the FIC-MIMAROPA. This stage will include heat distribution tests (HDT) and heat penetration tests (HPT).

The process with the most acceptable outcome will be subjected to commercial sterility tests. If the samples pass the test, the shelf-life test will follow. The target shelf-life is one year minimum.

Nutritional analysis will be conducted if the sample passes both the commercial sterility and shelf-life tests. The nutritional analysis is also required in the FDA Labelling Guidelines.

The MMFPF-MIMAROPA Retort Module will be used in the process optimization for mass production of the developed RTE products. Another set of HDT and HPT will be conducted for the module. The resulting products will undergo laboratory analyses necessary to ensure safety and product stability through commercial sterility, and physical, chemical, and microbial tests.

Cost analysis will be conducted in between product standardization and formulation. Upon finalization, IP registration will be filed for the developed products before marketing.

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

(11) EXPECTED OUTPUTS (6Ps)

Publication:
One (1) draft article highlighting the success stories and outcomes of R&D initiatives in the MIMAROPA region; One (1) AVP

Patent/Intellectual Property:
One (1) utility model application drafted for RTE arroz Caldo

Product:
One (1) optimized and standardized RTE arroz caldo

People Service:
n/a

Place and Partnership:
This project will be a collaborative undertaking between DOST-MIMAROPA and Mindoro State University. The anticipated development of the product will provide rice farmers with a steady market for their products.

Policy:
n/a

(12) POTENTIAL OUTCOMES

The proposed Research and Development project is anticipated to yield innovative and high-value products from rice, determine and compare the profitability of processing rice vis-à- vis commercially available products, and provide farmers access to stable markets through the technologies to be generated.

(13) POTENTIAL IMPACTS (2Is)

Social Impact
With this project, it is envisioned that the developed technology will be adopted by local food processors. This will also encourage clients to continue patronizing and promoting locally-made products and support rice farmers in the region.

Economic impact
This research aims to develop value-adding technology for rice. Processed rice will potentially generate an increase in the profit of farmers.

(14) TARGET BENEFICIARIES

Local farmers, particularly in Oriental Mindoro and nearby provinces will gain significantly from the project. Processing agricultural resources will provide a stable market which in turn enhances income despite the soaring prices of agricultural inputs and low prices of output in times of overproduction.

LGUs, NGAs, and CSOs will also benefit from the project since the products could be used in various feeding programs and even as emergency food during calamities.

(15) SUSTAINABILITY PLAN (if applicable)

The output of the project would enable farmers to gain a steady income despite the possible occurrence of a surplus in the region. The project team could forge partnerships with the LGUs to comply with their need for emergency food production and distribution. There could also be a forged collaboration between NGAs and CSOs for community-driven feeding programs.

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

(17) LIMITATIONS OF THE PROJECT

While the proposed project holds significant promise and potential for addressing critical food processing and food security challenges in the MIMAROPA region, it is essential to acknowledge certain limitations that may impact its scope and outcomes.

The project will focus mainly on product development – standardization of formulation, process optimization utilizing the installed water retort in FIC-MIMAROPA and MMFPF-MIMAROPA, and laboratory analyses.

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

Risks	Assumptions
Delayed procurement of materials	Timely procurement and installation
Product development may encounter technical challenges, such as difficulties in achieving the desired taste, texture, or shelf stability.	Smooth conduct of product development activities.
Interruption of the conduct of R&D due to technical issues in the water retort system.	Water retort is properly installed, calibrated, and maintained.

(19) LITERATURE CITED

Appert, N. (1810). The Art of Preserving Animal and Vegetable Substances for Several Years. Cadell and Davies.

Balasubramaniam, V. M., Barbosa-Cánovas, G. V., & Lelieveld, H. L. M. (Eds.). (2018). Food Engineering: Integrated Approaches. Springer.

Food and Agriculture Organization (FAO). (2019). Mobile Processing Units in Action: Bringing the Processing Plant to the Crop. Retrieved from http://www.fao.org/3/ca6200en/ca6200en.pdf

Gustavsson, J., Cederberg, C., Sonesson, U., Van Otterdijk, R., & Meybeck, A. (2011). Global food losses and food waste: Extent, causes and prevention. FAO.

Heldman, D. R., & Hartel, R. W. (2019). Principles of Food Processing. Springer.
Jayne, T. S., Chamberlin, J., & Headey, D. D. (2019). Land pressures, the evolution of farming systems, and development strategies in Africa: A synthesis. Food Policy, 83, 307-318.
Mazhar, H., & Mistry, V. V. (2016). Mobile food processing—a review. Journal of Food Science and Technology, 53(1), 34-46.
Mintel. (2021). The Future of Ready Meals 2021. Mintel Group Ltd.

Reardon, T., Bellemare, M. F., & Zilberman, D. (2019). Policy evolution in times of globalization: A conceptual framework with reference to food value chains and implications for food security. World Development, 120, 1-14.

Smith, A., Johnson, D., & Jones, E. (2018). Advances in Retort Processing: A Review. Food and Bioprocess Technology, 11(5), 951-971. https://doi.org/10.1007/s11947-017-2027-y

Swinnen, J., Vandeplas, A., Maertens, M., & Mathijs, E. (2019). Political economy, structural change, and economic policy in Africa: Sources of agricultural and rural development policies. World Development, 122, 1-1.

United Nations Educational, Scientific and Cultural Organization (UNESCO). (2021). Traditional Cuisine of Mexico's ancestral, ongoing community culture, the Michoacán paradigm. Retrieved from https://ich.unesco.org/en/RL/traditional-cuisine-of-mexicos-ancestral-ongoing-community-culture-the-michoacan-paradigm-01616

Zhou, C., Yang, J., & Zhu, Z. (2018). Recent Advances in High-pressure Processing of Foods for Improving Quality and Shelf Life. Comprehensive Reviews in Food Science and Food Safety, 17(3), 857-877.

(20) PERSONNEL REQUIREMENT

Position	Percent Time Devoted to the Project	Responsibilities
Project Leader	10%	Responsible for the overall technical and administrative management of the project to attain its objectives
Project Staff	10%	Assist the project leader in overseeing project deliverables
Project Technical Specialist	70%	Responsible for the conduct of research and development
Project Technical Specialist	70%	Responsible for the equipment operation, maintenance, and troubleshooting during the conduct of R&D

(21) BUDGET BY DOST-MIMAROPA

	PS	MOOE	EO	Total
Year 1		**1,329,945.92**	**625,870.00**	**1,955,815.92**
TOTAL		**1,329,945.92**	**625,870.00**	**1,955,815.92**

BUDGET BY MINDORO STATE UNIVERSITY

IMPLEMENTING AGENCY	PS	MOOE	EO	Total
Year 1	**552,000.00**	**60,000.00**		**612,000.00**
TOTAL	**552,000.00**	**60,000.00**		**612,000.00**

(22) 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**

(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	**LEONEL C. MENDOZA**	**DR. MA. JOSEFINA P. ABILAY**
Designation/Title	Asst. Prof. III, PME Coordinator	Regional Director
Date	November 19, 2024	

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

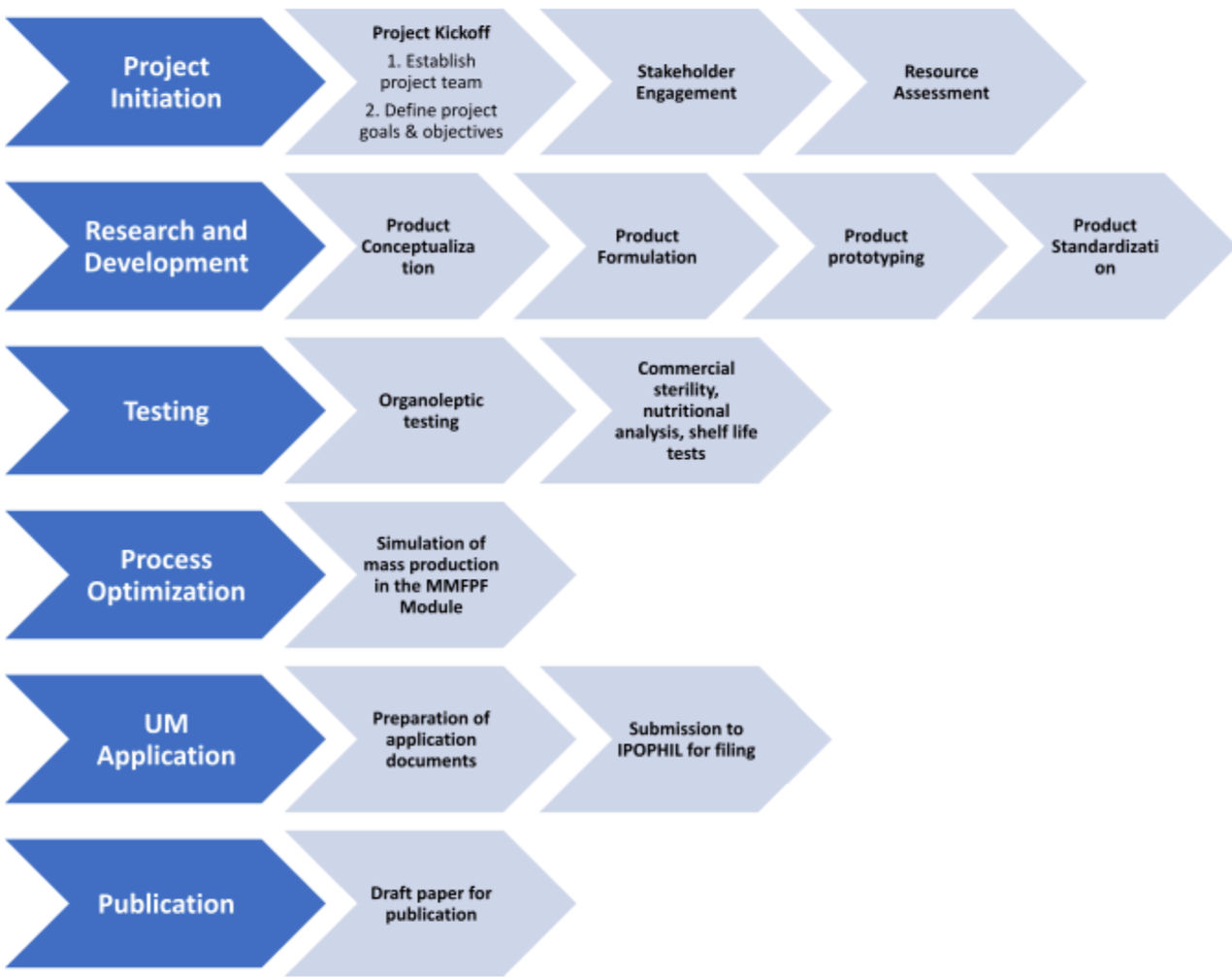
Criteria	Indicators	Raw Score
A. Soundness of Proposal (20%)	R&D addresses relevant sectoral need (applicable to pressing concern)	5
	Solution provided is most effective (compared to other proposed solutions)	5
	Proposed budget is reasonable (project is not expensive vis-a-vis output)	5
	Work plan is 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)

TECHNOLOGY ROADMAP

Annex A

Project Title: Development of Thermally Processed Rice-Based Products for the Mobile Modular Food Processing Facility - Retort Module



DOST Form 4

DEPARTMENT OF SCIENCE AND TECHNOLOGY
Project Line-Item Budget
CY2024

Program Title	:	Grants-in-Aid
Project Title	:	Development of Thermally Processed Rice-Based Products for the Mobile Modular Food Processing Facility - Retort
Implementing Agency	:	Mindoro State University
Total Duration	:	1 year
Current Duration	:	December 2024 - November 2025
Cooperating Agency	:	DOST-MIMAROPA/PSTO-Oriental Mindoro
Program Leader	:	Dr. Ma. Josefina P. Abilay
Project Leader	:	Leonel C. Mendoza
Monitoring Agency	:	DOST-MIMAROPA/PSTO-Oriental Mindoro

		Mindoro State University		DOST-MIMAROPA
I. Personal Services				
Direct Cost				
Salaries				
FIC-Manager (@Php 24,000.00/month x 12 months)		288,000.00		
FIC Administrative Aide (@Php 15,000.00/ month x 12 months)		180,000.00		
FIC Staff - Utility (@Php 7,000.00/ month x 12 months)		84,000.00		
Sub-Total for Personal Services	**P**	**552,000.00**		
II. Maintenance and Other Operating Expenses				
Direct Cost				
Traveling Expenses				
Local				***102,716.00***
Communication Expenses				
Postage and Courier Expenses				20,000.00
Mobile Expenses				***25,200.00***
Internet Subscription Expenses				***26,382.00***
Supplies and Materials Expenses				
Office Supplies Expenses				***35,705.00***
Semi-Expendables Equipment Expenses				160,782.65
Medical, Dental & Laboratory Supplies				27,289.50
Other Supplies and Materials				531,870.77
Other Professional Services				400,000.00
Utilities		60,000.00		
Sub-Total for MOOE	**P**	**60,000.00**	**P**	**1,329,945.92**
III. Equipment Outlay				
Information and Communication Technology Equipment				
Laptop (2 units) Windows 11 Home Up to GeForce RTX™ 3070 Laptop GPU Intel® Core™ i7-12650H Processor; MIL-STD-810H Standards Up to 15.6" QHD 165Hz 100% DCI-P3 Display Arc Flow Fans™; 19.95mm Thin Chassis All-day Battery Life & 100W Type-C ChargingRTX 3050 Ti 4GDDR6 / 15" FHD / 144Hz / i7-12650H / 8GB x 2 / 512GB PCIE3 SSD			P	187,000.00
Machinery				
Nitrogen Flushing Band Sealer (Vertical) Power: 0.6kw; Volts: 220v/60hz; Working speed: up to 12m/min Sealing width: 6-12mm; Temperature range: 0-300 degree with nitrogen tank and regulator hose				105,800.00
Temperature Controlled-storage bin Temperature range: -14°C to -25°C; Dual function: freezer/ chiller HD Inverter Compressor; Digital Temperature control with LCD Display With LED light; Min. Dimension: 85x112x70 cm (hwd)				40,000.00
Technical and Scientific Equipment				
Analytical Balance Readability: 0.1 mg; Pan Size: min 3.5 in (90 mm); Display: LCD with backlight Calibrated and with calibration certificate				89,470.00
Water Activity Meter Display: 6 bit backlight LCD digital display; Range: 0~1.0aw Resolution: ±0.01aw; Accuracy: ±0.02aw Operating Conditions- Temp : 0-50 ℃; Humidity: below 95% RH Power Supply: 2x1.5vAAA (UM-4) Battery				79,350.00

pH meter accuracy: ±0.003; Resolution: 0.1Mv with electrode stand and buffer solution (Ph 1.63,4.00, 7.00, 10.00) Calibrated with calibration certificate					63,250.00
Viscometer Measured Range (mPa.s) 1-6M Rotation Speed(rpm)0.1, 0.3, 0.6,1.5, 3, 6,12,30, 60Number of Spindle 4 types(L1-L4); Measurement Accuracy ±3%(Newtonian Fluid) Repeatability ±0.5% (FS)(Newtonian Fluid) Power Supply AC 220V-240V, 50/60HZ					61,000.00
Sub-Total for EO	**P**	**-**	**P**		**625,870.00**
GRAND TOTAL	**P**	**612,000.00**	**P**		**1,955,815.92**

Note: With mark-up for possible increase at the time of procurement.

Note: *The specifications of supplies and equipment are provided in detail on the succeeding page.*

Certified Funds Available:

JAY RALPH A. CABIAO
Accountant III

Approved by:

DR. MA. JOSEFINA P. ABILAY
Regional Director, DOST-MIMAROPA

Medical, Dental & Laboratory Supplies (for direct release)				
	Hairnet		1,322.50	
	Gloves		1,322.50	
	Mask		661.25	
	Nitrogen Tank with regulator	1 unit	13,800.00	
	Heat resistant gloves		3,570.75	
	Lab Gown		6,612.50	
Other Supplies and Materials (for direct release)				
	Packaging Materials (Retortable pouches)		428,370.77	Pet/NY/AL/RCPP (boilable) 120 microns Stand Up Pouch (w/o Zip) - Boilable up to 121°C size: 11 * 18+ 6 cm
	Raw Materials		103,500.00	
Semi-Expendable Office Supplies and Materials (for direc			***160,782.65***	
	pH pen (with calibration certificate)	1 unit	18,481.65	Calibrated; pH 0 to 14; Temp. 0 to 80 deg C; with calibration buffer Waterproof
	Food thermometer; bimetal; stainless	3 units	13,440.00	Range: -50.0 to 150.0°C Resolution: 0.1°C Accuracy (@20°C): ±0.5°C (-20 to 90°C) Typical EMC Deviation: ±0.3°C Probe: Stainless steel Switch ON/OFF: yes Calibration Check: yes Environment: 0 to 50°C; max RH 95% Battery Type: 1 x 1.5V Battery Life: approximately 3000 hours of continuous use Packaging dimensions: 254 x 67 x 47 mm Packaging weigh: 100
	Digital weighing scale	2 units	16,399.00	Max. Capacity: 30,000 g; graduation: 1 g; Weighing units: kg, g, lb, oz and pcs. Large LCD display with backlight; Built in rechargeable battery calibrated with calibration certificate
	High Pressure Washer	1 unit	8,613.50	Voltage: 220-240V~50/60Hz Input power:1400W Max Pressure:90Bar (1300PSI)
	Pipe Wrench	1 pc	2,875.00	Size:36" Max clamping diameter:85mm
	Repair Tool Set (Box wrench, socket, wre	1 set	7,475.00	100 Pcs Tools Set Include: 1 Pcs 1/2" ratchet wrench,72T 18Pcs 1/2" Hexagonal Socket: 10-11-12-13-14-15-16-17-18-19-20-21-22-23-24-27-30-32MM 2 Pcs 1/2" Extension bar:125mm (5") / 250mm(10") 1 Pcs 1/2" Dr. Universal joint 2 Pcs Spark plug socket 1/2"Dr.16MM&21MM 1 Pcs 1/2"*3/8" three way adaptor 1 Pcs 1/4" ratchet wrench,72T 13Pcs 1/4" Hexagonal Socket:4-4.5-5-5.5-6-7-8-9-10-11-12-13-14 2 Pcs 1/4" Extension bar:50mm (2") / 100mm(4") 1 Pcs 1/4" sliding "T" bar 1 Pcs 1/4" Dr. Universal joint 8 Pcs Combination spanner:6-8-10-12-14-15-17-19MM 1 Pcs 6" Diagonal Cutting Pliers 1 Pcs 6" Long nose pliers 1 Pcs SL5.5*100 Screwdriver 1 Pcs PH1*100 Screwdriver 14Pcs Bit socket:T10-T15-T20-T25-T27-T30-T35-SL4-SL5.5-SL6.5-PH1-PH2-PZ1-PZ2 9 Pcs Hex key 1.5-2-2.5-3-4-5-6-8-10MM 20 Pcs 1/4" Screwdriver bits SL3,SL4,SL5,SL6,PH0,PH1,PH2,PH3,PZ0,PZ1,PZ2,PZ3,T10,T15,T20,T30,H3,H4,H5,H 6 25mm 1Pcs Screwdriver Bits holder 1Pcs 1/4"*150mm Spinner handle
	Smart Multitester	1 unit	2,047.00	BS plug, LCD Display Voltage Range : AC 90-250v Frequency: 45-65Hz Leakage voltage: AC 0-90v RCD test: >30mA
	Plier Tool set	1 set	1,002.53	Includes - 8" combination pliers 7" diagonal cutting pliers 6" long nose pliers
	Hex Key Long Arm	1 pc	396.75	Hex key, long arm, 9 pcs set T10, T15, 120, T27, T30, T40, T45, T50
	Rubber mallet	1 pc	282.85	Weight: 16oz/450g Rubber hammerhead

	Food processor	1 unit	20,845.00	Heavy duty; with LED indicator; 14 cup, BPA Bowls, easy clean touchpad Cuts dice, cubes, slice - thick/ thin, chop, knead, puree
	Volumetric Pipette	3 pc	10,350.00	Light weight, ergonomic, low force design Digital display Volume range of 0.1µl to 10ml 8 and 12 channel pipettes are available for standard 96-well plate Rotating Dispensing head with Individual piston/tips
	Microwave Oven	1 unit	6,440.00	28 Liter Capacity Mechanical Control Mechanical Knob 30-minute Timer
	Digital Refractometer	1 unit	32,410.72	Range: 0 to 50% Brix | 0 to 25% v/v Potential Alcohol | 0 to 80°C / 32 to 176°F Resolution: 0.1% Brix | 0.1% v/v Potential Alcohol | 0.1°C / 0.1°F Accuracy: ±0.2% Brix | ±0.2% v/v Potential Alcohol | ±0.3°C / ±0.5°F Light Source: Yellow LED Measurement Time: Approximately 1.5 seconds Minimum Sample: Volume 100 µL or 2 metrics drops (cover prism totally) Sample Cell: Stainless steel ring and flint glass prism Temperature Compensation: Automatic
	**Filing Cabinet, lateral, 4 layers	1 unit	19,723.65	**For PSTO use (not for direct release)
Other Professional Services (for direct release)			***400,000.00***	
	Commercial sterility	10 samples	56,000.00	
	Shelf life test	3 samples	130,000.00	
	Nutritional analysis	3 samples	94,000.00	
	Calibration (thermal validations eq.)		120,000.00	

-

DOST Form 5

A – PROJECT WORKPLAN

(1) Program Title: **Grants-In-Aid Program (GIA)**
(2) Project Title: **Development of Thermally Processed Rice-Based Products for the Mobile Modular Food Processing Facility - Retort Module**
(3) Project Duration (number of months): Year 1 – 12 months **(4) Project Start Date:** December 2024 **(5) Project End Date:** November 2025

(6) OBJECTIVES	(7) TARGET ACTIVITIES	(8) TARGET ACCOMPLISHMENTS (quantify, if possible)	2024	2025			
			Q4	Q1	Q2	Q3	Q4
To acquire necessary equipment, tools, and supplies for the conduct of the R&D	Project proposal preparation	Prepared one (1) project proposal for funding					
	Presentation of Proposal to RTEC	Presented one (1) project proposal					
	Revision of Proposal	Revised one (1) project proposal					
	Approval of Project	Approved one (1) project proposal					
	Procurement of materials and equipment	Procurement of raw materials, packaging materials, and equipment for the conduct of R&D					
To conduct process optimization, product formulation, and standardization of ready-to-eat arroz caldo using the water retort installed at the FIC-MIMAROPA;	Conduct of product formulation and process standardization	Three (3) products formulated					
	Conduct process optimization at FIC-MIMAROPA and MMFPF MIMAROPA	Optimized production run at FIC-MIMAROPA and MMFPF MIMAROPA					
To conduct laboratory analyses to determine the end-product quality and safety	Product analysis – commercial sterility, nutritional analysis, and shelf-life tests	Three (3) products tested					
To conduct pre- and post-evaluation of the project to determine the impact of technical assistance	Monitoring and Documentation	Monitored and documented one (1) project					
	Project Evaluation	Evaluated one (1) project					

DOST Form 5

B – EXPECTED OUTPUTS

(1) Program Title: **Grants-In-Aid Program (GIA)**
(2) Project Title: **Development of Thermally Processed Rice-Based Products for the Mobile Modular Food Processing Facility - Retort Module**
(3) Project Duration (number of months): Year I – 12 months **(4) Project Start Date:** December 2024 **(5) Project End Date:** November 2025

(9) EXPECTED OUTPUTS (6Ps)	Y1 Objectively Verifiable Indicators (OVIs)				
	Q1	Q2	Q3	Q4	Total
Publications				- One (1) article drafted highlighting the success stories and outcomes of R&D initiatives in the MIMAROPA region - One (1) AVP	- One (1) article drafted highlighting the success stories and outcomes of R&D initiatives in the MIMAROPA region - One (1) AVP
Patents/IP				- One (1) utility model application drafted.	- One (1) utility model drafted/ applied
Products				- One (1) optimized and standardized RTE Arroz caldo.	- One (1) optimized and standardized RTE Arroz caldo.
People Services					n/a
Places and Partnerships				- Collaborative activities between Mindoro State University and DOST-MIMAROPA	- Collaborative activities between Mindoro State University and DOST-MIMAROPA
Policy					n/a

(10) POTENTIAL IMPACTS (2Is)	Q1	Q2	Q3	Q4	Total
Social Impact	With this project, it is envisioned that the developed technology will be adopted by the Provincial Government of Oriental Mindoro and other local food processors. This will also encourage Mindoreños to continue patronizing and promoting locally-made products as a support to rice farmers in the province.				
Economic Impact	This research aims to develop value-adding technology for rice. Processed rice will potentially generate an increase in the profit of farmers.				

DOST Form 5

C – RISKS AND ASSUMPTIONS

(1) Program Title: **Grants-In-Aid Program (GIA)**
(2) Project Title: **Development of Thermally Processed Rice-Based Products for the Mobile Modular Food Processing Facility - Retort Module**
(3) Project Duration (number of months): Year I – 12 months **(4) Project Start Date:** December 2024 **(5) Project End Date:** November 2025

OBJECTIVES	(11) RISKS AND ASSUMPTIONS	(12) ACTION PLAN (use separate sheet if necessary)
To provide technological assistance for the acquisition of band sealer, pH meter, water activity meter, refractometer, laptops, packaging materials, and raw materials	Risk: Delay in the procurement process Assumption: Timely procurement and installation	Maintain regular communication with equipment suppliers, anticipate potential delays, and have contingency plans in place.
To conduct product formulation and standardization of ready-to-eat arroz caldo	Risk: Product development may encounter technical challenges, such as difficulties in achieving the desired taste, texture, or shelf stability. Assumption: Smooth conduct of product development activities.	Consistent evaluation of each formulation throughout the stages of product development activities by sensory evaluation and commercial sterility tests.
To conduct process optimization using the water retort installed at the FIC-MIMAROPA and MMFPF-MIMAROPA	Risk: Interruption of the conduct of R&D due to technical issues in the water retort system. Assumption: Water retort is properly installed, calibrated, and maintained.	Regular maintenance checks and inspection of the equipment and collaboration with the experts to continuously optimize the process for efficiency and safety.
To conduct laboratory analysis to determine the product quality and safety;	Risk: Late conduct of product analysis due to unavailability of laboratory services Assumption: Coordinate with FDA-accredited laboratories ahead of time to ensure a flawless transaction	Maintain regular communication with laboratories for testing schedules ahead of time.
To conduct pre- and post-evaluation of the project to determine the impact of technical assistance	Risk: Data collection challenges or limited participation in evaluation. Assumption: Willingness and availability of participants for evaluation activities.	Implement a clear data collection process, and develop comprehensive evaluation criteria and data collection methods.

DOST Form 5
PROJECT WORKPLAN, EXPECTED OUTPUTS, RISKS AND ASSUMPTIONS

I. General Instruction: Submit through the DOST Project Management Information System (DPMIS), http://dpmis.dost.gov.ph, the project workplan, expected outputs, and risks and assumptions together with the project proposal. Also, submit four (4) copies of these forms together with the proposal. Use Arial font, 11 font size.

II. Operational Definition of Terms:

1-2. Program/Project Title- the identification of the Program and its component projects.

3-5. Project Duration and **Project Start/End Date**- refer 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.

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

7. Target Activities- set of fixed works that needs to be conducted for the achievement of the project objectives.

8. Target Accomplishments- measurable and positive results of completing project activities.

9. Expected Outputs- deliverables of the project based on the 6Ps metrics (Publications, Patents/Intellectual Property, Products, People Services, Places and Partnerships, and Policy).

a. **Publication**- published aspect of the research, or the whole of it, in a scientific journal for peer review. (get Definition from DOST OUTcomes)

b. **Patent/Intellectual Property-** proprietary invention or scientific process for potential future profit.

c. **Product-** invention with a potential for commercialization.

d. **People Services-** people or groups of people, who receive technical knowledge and training.

e. **Partnership-** linkage forged because of the study.

f. **Policy-** science-based policy crafted and adopted by the government or academe as a result of the study.

10. Potential Impacts
a. Social Impact- refers to the effect or influence of the project to the reinforcement of social ties and building of local communities.

b. 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.

11. 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.

12. Action Plan- proposed activities to address the risks and assumptions

DOST Form 5

A – PROJECT WORKPLAN

(1) Program Title: **Grants-In-Aid Program (GIA)**
(2) Project Title: **Development of Thermally Processed Rice-Based Products for the Mobile Modular Food Processing Facility - Retort Module**
(3) Project Duration (number of months): Year 1 – 12 months **(4) Project Start Date:** January 2024 **(5) Project End Date:** December 2024

(6) OBJECTIVES	(7) TARGET ACTIVITIES	(8) TARGET ACCOMPLISHMENTS (quantify, if possible)	2023	2024			
			Q4	Q1	Q2	Q3	Q4
To acquire necessary equipment, tools, and supplies for the conduct of the R&D	Project proposal preparation	Prepared one (1) project proposal for funding					
	Presentation of Proposal to RTEC	Presented one (1) project proposal					
	Revision of Proposal	Revised one (1) project proposal					
	Approval of Project	Approved one (1) project proposal					
	Procurement of materials and equipment	Procurement of raw materials, packaging materials, and equipment for the conduct of R&D					
To conduct process optimization, product formulation, and standardization of ready-to-eat arroz caldo using the water retort installed at the FIC-MIMAROPA;	Conduct of product formulation and process standardization	Three (3) products formulated					
	Conduct process optimization at FIC-MIMAROPA and MMFPF MIMAROPA	Optimized production run at FIC-MIMAROPA and MMFPF MIMAROPA					
To conduct laboratory analyses to determine the end-product quality and safety	Product analysis – commercial sterility, nutritional analysis, and shelf-life tests	Three (3) products tested					
To conduct pre- and post-evaluation of the project to determine the impact of technical assistance	Monitoring and Documentation	Monitored and documented one (1) project					
	Project Evaluation	Evaluated one (1) project					

DOST Form 5

B – EXPECTED OUTPUTS

(1) Program Title: **Grants-In-Aid Program (GIA)**
(2) Project Title: **Development of Thermally Processed Rice-Based Products for the Mobile Modular Food Processing Facility - Retort Module**
(3) Project Duration (number of months): Year I – 12 months **(4) Project Start Date:** January 2024 **(5) Project End Date:** December 2024

(9) EXPECTED OUTPUTS (6Ps)	Y1 Objectively Verifiable Indicators (OVIs)				
	Q1	Q2	Q3	Q4	Total
Publications				- One (1) article drafted highlighting the success stories and outcomes of R&D initiatives in the MIMAROPA region - One (1) AVP	- One (1) article drafted highlighting the success stories and outcomes of R&D initiatives in the MIMAROPA region - One (1) AVP
Patents/IP				- One (1) utility model application drafted.	- One (1) utility model drafted/ applied
Products				- One (1) optimized and standardized RTE Arroz caldo.	- One (1) optimized and standardized RTE Arroz caldo.
People Services					n/a
Places and Partnerships				- Collaborative activities between Mindoro State University and DOST-MIMAROPA	- Collaborative activities between Mindoro State University and DOST-MIMAROPA
Policy					n/a

(10) POTENTIAL IMPACTS (2Is)	Q1	Q2	Q3	Q4	Total
Social Impact	With this project, it is envisioned that the developed technology will be adopted by the Provincial Government of Oriental Mindoro and other local food processors. This will also encourage Mindoreños to continue patronizing and promoting locally-made products as a support to rice farmers in the province.				
Economic Impact	This research aims to develop value-adding technology for rice. Processed rice will potentially generate an increase in the profit of farmers.				

DOST Form 5

C – RISKS AND ASSUMPTIONS

(1) Program Title: **Grants-In-Aid Program (GIA)**
(2) Project Title: **Development of Thermally Processed Rice-Based Products for the Mobile Modular Food Processing Facility - Retort Module**
(3) Project Duration (number of months): Year I – 12 months **(4) Project Start Date:** January 2024 **(5) Project End Date:** December 2024

OBJECTIVES	(11) RISKS AND ASSUMPTIONS	(12) ACTION PLAN (use separate sheet if necessary)
To provide technological assistance for the acquisition of band sealer, pH meter, water activity meter, refractometer, laptops, packaging materials, and raw materials	Risk: Delay in the procurement process Assumption: Timely procurement and installation	Maintain regular communication with equipment suppliers, anticipate potential delays, and have contingency plans in place.
To conduct product formulation and standardization of ready-to-eat arroz caldo	Risk: Product development may encounter technical challenges, such as difficulties in achieving the desired taste, texture, or shelf stability. Assumption: Smooth conduct of product development activities.	Consistent evaluation of each formulation throughout the stages of product development activities by sensory evaluation and commercial sterility tests.
To conduct process optimization using the water retort installed at the FIC-MIMAROPA and MMFPF-MIMAROPA	Risk: Interruption of the conduct of R&D due to technical issues in the water retort system. Assumption: Water retort is properly installed, calibrated, and maintained.	Regular maintenance checks and inspection of the equipment and collaboration with the experts to continuously optimize the process for efficiency and safety.
To conduct laboratory analysis to determine the product quality and safety;	Risk: Late conduct of product analysis due to unavailability of laboratory services Assumption: Coordinate with FDA-accredited laboratories ahead of time to ensure a flawless transaction	Maintain regular communication with laboratories for testing schedules ahead of time.
To conduct pre- and post-evaluation of the project to determine the impact of technical assistance	Risk: Data collection challenges or limited participation in evaluation. Assumption: Willingness and availability of participants for evaluation activities.	Implement a clear data collection process, and develop comprehensive evaluation criteria and data collection methods.

DOST Form 5

A – PROJECT WORKPLAN

(1) Program Title: **Grants-In-Aid Program (GIA)**
(2) Project Title: **Development of Thermally Processed Rice-Based Products for the Mobile Modular Food Processing Facility - Retort Module**
(3) Project Duration (number of months): Year 1 – 12 months **(4) Project Start Date:** December 2024 **(5) Project End Date:** November 2025

(6) OBJECTIVES	(7) TARGET ACTIVITIES	(8) TARGET ACCOMPLISHMENTS (quantify, if possible)	2024	2025			
			Q4	Q1	Q2	Q3	Q4
To acquire necessary equipment, tools, and supplies for the conduct of the R&D	Project proposal preparation	Prepared one (1) project proposal for funding					
	Presentation of Proposal to RTEC	Presented one (1) project proposal					
	Revision of Proposal	Revised one (1) project proposal					
	Approval of Project	Approved one (1) project proposal					
	Procurement of materials and equipment	Procurement of raw materials, packaging materials, and equipment for the conduct of R&D					
To conduct process optimization, product formulation, and standardization of ready-to-eat arroz caldo using the water retort installed at the FIC-MIMAROPA;	Conduct of product formulation and process standardization	Three (3) products formulated					
	Conduct process optimization at FIC-MIMAROPA and MMFPF MIMAROPA	Optimized production run at FIC-MIMAROPA and MMFPF MIMAROPA					
To conduct laboratory analyses to determine the end-product quality and safety	Product analysis – commercial sterility, nutritional analysis, and shelf-life tests	Three (3) products tested					
To conduct pre- and post-evaluation of the project to determine the impact of technical assistance	Monitoring and Documentation	Monitored and documented one (1) project					
	Project Evaluation	Evaluated one (1) project					

DOST Form 5

B – EXPECTED OUTPUTS

(1) Program Title: **Grants-In-Aid Program (GIA)**
(2) Project Title: **Development of Thermally Processed Rice-Based Products for the Mobile Modular Food Processing Facility - Retort Module**
(3) Project Duration (number of months): Year I – 12 months **(4) Project Start Date:** December 2024 **(5) Project End Date:** November 2025

(9) EXPECTED OUTPUTS (6Ps)	Y1 Objectively Verifiable Indicators (OVIs)				
	Q1	Q2	Q3	Q4	Total
Publications				- One (1) article drafted highlighting the success stories and outcomes of R&D initiatives in the MIMAROPA region - One (1) AVP	- One (1) article drafted highlighting the success stories and outcomes of R&D initiatives in the MIMAROPA region - One (1) AVP
Patents/IP				- One (1) utility model application drafted.	- One (1) utility model drafted/ applied
Products				- One (1) optimized and standardized RTE Arroz caldo.	- One (1) optimized and standardized RTE Arroz caldo.
People Services					n/a
Places and Partnerships				- Collaborative activities between Mindoro State University and DOST-MIMAROPA	- Collaborative activities between Mindoro State University and DOST-MIMAROPA
Policy					n/a

(10) POTENTIAL IMPACTS (2Is)	Q1	Q2	Q3	Q4	Total
Social Impact	With this project, it is envisioned that the developed technology will be adopted by the Provincial Government of Oriental Mindoro and other local food processors. This will also encourage Mindoreños to continue patronizing and promoting locally-made products as a support to rice farmers in the province.				
Economic Impact	This research aims to develop value-adding technology for rice. Processed rice will potentially generate an increase in the profit of farmers.				

DOST Form 5

C – RISKS AND ASSUMPTIONS

(1) Program Title: **Grants-In-Aid Program (GIA)**
(2) Project Title: **Development of Thermally Processed Rice-Based Products for the Mobile Modular Food Processing Facility - Retort Module**
(3) Project Duration (number of months): Year I – 12 months **(4) Project Start Date:** December 2024 **(5) Project End Date:** November 2025

OBJECTIVES	(11) RISKS AND ASSUMPTIONS	(12) ACTION PLAN (use separate sheet if necessary)
To provide technological assistance for the acquisition of band sealer, pH meter, water activity meter, refractometer, laptops, packaging materials, and raw materials	Risk: Delay in the procurement process Assumption: Timely procurement and installation	Maintain regular communication with equipment suppliers, anticipate potential delays, and have contingency plans in place.
To conduct product formulation and standardization of ready-to-eat arroz caldo	Risk: Product development may encounter technical challenges, such as difficulties in achieving the desired taste, texture, or shelf stability. Assumption: Smooth conduct of product development activities.	Consistent evaluation of each formulation throughout the stages of product development activities by sensory evaluation and commercial sterility tests.
To conduct process optimization using the water retort installed at the FIC-MIMAROPA and MMFPF-MIMAROPA	Risk: Interruption of the conduct of R&D due to technical issues in the water retort system. Assumption: Water retort is properly installed, calibrated, and maintained.	Regular maintenance checks and inspection of the equipment and collaboration with the experts to continuously optimize the process for efficiency and safety.
To conduct laboratory analysis to determine the product quality and safety;	Risk: Late conduct of product analysis due to unavailability of laboratory services Assumption: Coordinate with FDA-accredited laboratories ahead of time to ensure a flawless transaction	Maintain regular communication with laboratories for testing schedules ahead of time.
To conduct pre- and post-evaluation of the project to determine the impact of technical assistance	Risk: Data collection challenges or limited participation in evaluation. Assumption: Willingness and availability of participants for evaluation activities.	Implement a clear data collection process, and develop comprehensive evaluation criteria and data collection methods.

DOST Form 5
PROJECT WORKPLAN, EXPECTED OUTPUTS, RISKS AND ASSUMPTIONS

I. General Instruction: Submit through the DOST Project Management Information System (DPMIS), http://dpmis.dost.gov.ph, the project workplan, expected outputs, and risks and assumptions together with the project proposal. Also, submit four (4) copies of these forms together with the proposal. Use Arial font, 11 font size.

II. Operational Definition of Terms:

1-2. Program/Project Title- the identification of the Program and its component projects.

3-5. Project Duration and **Project Start/End Date**- refer 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.

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

7. Target Activities- set of fixed works that needs to be conducted for the achievement of the project objectives.

8. Target Accomplishments- measurable and positive results of completing project activities.

9. Expected Outputs- deliverables of the project based on the 6Ps metrics (Publications, Patents/Intellectual Property, Products, People Services, Places and Partnerships, and Policy).

a. **Publication**- published aspect of the research, or the whole of it, in a scientific journal for peer review. (get Definition from DOST OUTcomes)

b. **Patent/Intellectual Property-** proprietary invention or scientific process for potential future profit.

c. **Product-** invention with a potential for commercialization.

d. **People Services-** people or groups of people, who receive technical knowledge and training.

e. **Partnership-** linkage forged because of the study.

f. **Policy-** science-based policy crafted and adopted by the government or academe as a result of the study.

10. Potential Impacts
a. Social Impact- refers to the effect or influence of the project to the reinforcement of social ties and building of local communities.

b. 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.

11. 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.

12. Action Plan- proposed activities to address the risks and assumptions