DOST Form 3

NON-R&D PROJECT PROPOSAL

(Technology Transfer, S&T Promotion and Linkages, Policy Advocacy, Provision of S&T Services, Human Resource Development and Capacity-Building)

I. PROJECT PROFILE

(1) Program Title: Grants-in-Aid
Project Title: Establishment of Ice Plant at Marine Fish Landing Center in Carmen Bay

(2) Project Leader/Sex: Hon. Esteban Santiago F. Madrona Jr./Male
Agency (smallest unit)**:** LGU-San Agustin
Address/Telephone/Fax/Email (Barangay, Municipality, District, Province, Region)**:**
Brgy. Poblacion, San Agustin, Romblon/ esfmadrona@yahoo.com

(3) Cooperating Agency/ies (Name/s and Address/es)**:**
LGU-San Agustin, Brgy. Poblacion, San Agustin, Romblon

(4) Implementing Agency (Municipality / District / Province / Region)
Base Station: Brgy. Carmen, San Agustin, Romblon/MIMAROPA
Other Implementation Site (s): None

(5) Project Duration (number of months):
Project Start Date: April 2023
Project End Date: April 2024

(6) Total Project Cost: PhP2,564,000.00 (indicate Counterpart Funds; use Form 4 for the Line-Item Budget)

Implementing Agency/ies	PS	MOOE	EO	Total
A. Requested Fund				
GIA		PhP64,000.00	PhP2,500,000.00	PhP2,564,000.00
B. Counterpart Fund 1				
LGU-San Agustin		PhP304,256.00	PhP3,000,000.00	PhP3,304,256.00
TOTAL		**PhP368,256.00**	**PhP5,500,000.00**	**PhP5,868,256.00**

II. PROJECT SUMMARY

(7) Executive Summary (not to exceed 200 words)

The project aims to establish an Ice Plant at Marine Fish Landing Center along Carmen Bay of the municipality of San Agustin. The ice plant would have a 1-ton capacity complete with technical system and accessory requirements such as crusher, 15kg-capacity ice box, agitator, 30-tonner cooling tower, 7Hp compressor, 5-tonner condenser, 5-tonner evaporator, storage facility, 2-tonner water tank, and connections from a filtered water source. The facility would address the gaps brought by the absence of an ice plant in the municipality such as low productivity of fisherfolks, inefficient fish preservation, and high operating expenses in fish preservation during transport. The project will be handled by the LGU-San Agustin but the beneficiaries would be the 2,038 registered fisherfolks in the municipality. The equipment will be the counterpart of the DOST-MIMAROPA while the land, building, and power (3-phase) and water requirement will be the counterpart of the LGU-San Agustin. Training on the proper ice plant operation and maintenance will be required from the supplier of the equipment.

(8) Introduction (Not to exceed 15 pages)

Rationale/Significance (Not to exceed 300 words)

Fish is the second most common food in the Philippines after rice, making fishing a significant source of food and income for the population. This is also true in the municipality of San Agustin, especially for its coastal communities. The main fishing grounds in the municipality are the open sea surrounding the coastal town and Carmen Bay which spanned through the barangays of Carmen, Sugod, and Mahabang Baybay. Some of the economically important marine species that could be found within the municipality's waters include the locally known *bisugo* (threadfin beam), *dugso* (emperor fish), *maya-maya* (red snapper), *malasugi* (sail fish or blue marlin), *lapu-lapu* (grouper), *tanigue* (spanish mackerel), yellowfin, blue marlin, *galong-gong (*round scad*), tulingan (*frigate tuna*), magudlong* or *matambaka (*big-eyed scad*),* and *pulang buntot (*red-tailed scad*)*. As of 2022, there were 2,038 registered fishermen with a total of 800 fishing boats of which 401 are motorized while only 399 are non-motorized. In Barangay Mahabang Baybay alone, there are six existing large fishing boats, locally known *pangulong* which cater to up to five tons of fish catch, especially during fishing season. The total fish catch of the municipality from both marginal and commercial fisherfolks in 2022 reached 967.8 metric tons with a value of PhP79.8 million. Ironically, fisherfolks in San Agustin opt to sell their catch to the Lucena market in Quezon Province. This is because most of the fish traders in Romblon dictate lower prices for the fish catch. Moreover, these fish traders do not have huge cold storage facilities that are enough to preserve the bulk volume of fish from the fisherfolks.

In terms of transportation, fish products require huge amounts of ice to facilitate effective preservation. More ice means lower temperature and if the temperature is decreased, the metabolic activity in the fish is reduced or stopped resulting in extended shelf life. Proper preservation of fish is obtained by covering the fish uniformly with layers of ice in the fish containers before it is transported to the target markets in neighboring municipalities. The longer the transport period, the higher the requirement of ice to ensure the fish is well preserved during transport. Since there is no existing ice plant and cold storage facility in the municipality, fisherfolks rely on small-scale ice producers like grocery stores and private individuals. This causes high expenses for the fisherfolks and yields poor results in preservation as the ice produced by small-scale ice makers melts faster.

To get an overview of the demand for ice in the fishing sector, the following data is considered. One fish container with 50 kilos fish capacity needs at least 30 to 50 kg. of ice. With an average of 80.65 metric tons of fish catch per month, at least 1,600 fish containers require full ice application. Given the ratio of 50 kg. of ice per container, an average of 80,000 kg of ice is needed per month amounting to PhP320,000 per month (computed at PhP200 per 50kg of ice). This rate on the other hand is still expected to increase during fish seasons. The unavailability of an ice plant to produce sufficient ice blocks to maintain the freshness of fish and accessible cold storage to secure the abundant fish catch force the fisherfolks to sell their catch at a cheaper price. Moreover, additional expenses incurred on fuel to buy bulk amounts of ice also result in low profit and income for fisherfolks. The presence of an ice plant and a cold storage facility would address these gaps. It will ensure enough supply of ice to preserve fish and will help in decreasing the expenses on ice of fisherfolks, hence improving their productivity and profitability. Not only the ice plant and the cold storage facility will benefit the fisherfolks and encourage large fish production in the municipality but also attract both big and small investors to invest in certain profitable related industries.

The following assumptions for projected revenues are considered for the project. A 1-ton capacity ice plant could produce 33 blocks of ice in an 8-hour operation. Each block of ice is equivalent to 15 kg. If the plant has 2 shifting work schedules at a 6-day workweek (28 days/month), an average of 27,700kg of ice per month would be produced by the plant. At PhP25.00 per kg. of ice, annual revenue generation of PhP8.31 million. Assuming a 20% gross profit margin rate and 10% net profit margin, the payback period is 3 years, and the return on investment is 12.23%. Meanwhile if computed for monetary value the added benefits of putting up the ice plant, the savings from postharvest losses and from logistics/storage as well as the added income for fisherfolks would have a summative value of 1.6M for every 80.65 metric tons of fish catch per month.

Objectives (General and Specific)

The general objective of this project is to improve the productivity of San Agustin fisherfolks through the establishment of a 1-tonner Ice Plant at Marine Fish Landing Center along Carmen Bay in Brgy. Carmen, San Agustin.

Specifically, it seeks to:

1. establish a 1-ton capacity ice plant complete with technical system and accessory requirements such as crusher, 15kg-capacity ice box, agitator, 30-tonner cooling tower, 7Hp compressor, 5-tonner condenser, 5-tonner evaporator, storage facility, 2-tonner water tank, and connections from a filtered water source;
2. conduct at least 2 training activities for ice plant operators such as proper equipment operation and maintenance/basic occupational safety and health/current good manufacturing practices, and for the San Agustin fisherfolks such as proper marine fish operation/appropriate fish post-harvest practices;
3. allocate at least PhP2,000,000 counterpart funds from LGU-San Agustin;
4. decrease expenses of fisherfolks in terms of purchasing ice by at least 10%;
5. minimize fish waste due to inefficient preservations by at least 10%;
6. improve income and productivity of San Agustin fisherfolks by at least 10%.

Methodology

Once the project has been approved and the funding has been allocated, the DOST-MIMAROPA, with the help of the PSTO-ROMBLON, would facilitate the purchase of necessary equipment for the ice plant. While the procurement process as well as the installation and trial run of the facility are ongoing, necessary baseline data would be established. Meanwhile, the LGU-San Agustin would ensure that the structural requirements (land and building), power requirement (3 phase), and water requirement meet the standards and demand of the proposed ice plant. For these technical requirements, a private consultant from the ice manufacturing industry will be tapped to provide technical direction to ensure that these requirements are met. The LGU-San Agustin would also assign at least 2 operators to regularly operate and maintain the facility. Training for these operators will be sourced from the supplier that would establish the ice plant and from a consultant from the ice manufacturing industry. The LGU-San Agustin would also be encouraged to craft a policy for the fisherfolks to source their ice needs from the plant to maximize its purpose. The Bureau of Fisheries and Aquatic Resources (BFAR) Romblon would also be tapped to provide training activities like proper marine fish operation, and appropriate fish post-harvest practices. Overall, the PSTO-Romblon will work closely with LGU-San Agustin to ensure the success of the project.

Expected Outputs

Publication	At least 1 feature article about the notable accomplishments of the project
Patent/Intellectual Property	None
Product	None
People Service	LGU-San Agustin, 2,038 fisherfolks
Place and Partnership	LGU-Sal Agustin, BFAR-Romblon
Policy	At least 1 possible policy for fisherfolks to source their ice needs from the plant

Expected Outcomes

1. One operational ice plant at Marine Fish Landing Center along Carmen Bay in Brgy. Carmen, San Agustin
2. Conducted at least 2 training activities for ice plant operators such as proper equipment operation and maintenance/basic occupational safety and health/current good manufacturing practices, and for the San Agustin fisherfolks such as proper marine fish operation/appropriate fish post-harvest practices
3. Allocated at least PhP2,000,000 counterpart funds from LGU-San Agustin
4. Decreased expenses of fisherfolks in terms of purchasing ice by at least 10%
5. Minimized fish waste due to inefficient preservations by at least 10%
6. Improved income and productivity of San Agustin fisherfolks by at least 10%.

Perceived Impact

Social Impact

1. Well-preserved fish means safe fish for human consumption; hence the facility would contribute to the health and wellness of the consumers.
2. Well-preserved fish would also mean fisherfolks could command higher prices for their fish catch, hence increasing their income and promoting their well-being.

Economic impact

1. The ice plant is expected to provide 1 ton supply of ice per production for the fisherfolks in the municipality. This supply would be sufficient to meet the need for preserving the fish for transport to target markets.
2. Sufficient supply of ice would also support the sustainability of seafood supply to consumers.
3. The presence of an ice plant in the municipality would also attract investors to invest in related industries and encourage large fish production in the municipality. Subsequently, this would result in more economic opportunities not only for fisherfolks but also for the key players in the fish industry like fish traders and processors.

Discussion on the results of related projects handled by the same proponent (if any):

The LGU-San Agustin as the proponent of this project has successfully implemented various projects related to the fisheries industry. Some of the recent projects that the LGU has implemented were distribution of fishing boat engines, and fishing buoys to fisherfolks and mangrove planting in various protected areas. All the equipment and facility under these projects are well maintained and implementation is all sustainable.

Target Beneficiaries:

The direct beneficiaries of the project are the 2,038 fisherfolks in the municipality of San Agustin. Meanwhile, the municipality of San Agustin will indirectly benefit from the project as it is expected that there will be an increase in economic activity in the fisheries industry in the municipality. Also, processors of fish and other marine products would indirectly benefit from the project as the post-harvest practices in the fisheries industry will be improved contributing to the increase in production of fish and other marine products in the municipality.

Sustainability Plan (if applicable)**:**

The DOST-MIMAROPA through its Romblon Provincial Science and Technology Office (PSTO), LGU-San Agustin, and Bureau of Fisheries and Aquatic Resources (BFAR) Romblon would work together to maximize and sustain the project. The LGU-San Agustin would also be encouraged to craft a policy for the fisherfolks to source their ice needs from the plant to maximize its purpose and increase its potential for sustainability. Operators of the facility assigned by LGU San-Agustin will also be provided with training to appropriately operate and maintain the facility to prolong its service life. Minimal fees to cover operating and maintenance expenses would also be established to sustain the project. Project monitoring would be done by the LGU-San Agustin with close

supervision of DOST Romblon. Monthly monitoring of the project implementation and expected output will be done by the assigned staff in DOST Romblon to ensure the sustainability and success of the project.

(9) Workplan (See Form 5)

(10) Project Management (not to exceed one page)

The project will be implemented by DOST-MIMAROPA Romblon provincial office in close partnership with LGU-San Agustin. DOST will facilitate the procurement of the ice plant from delivery to installation and commissioning/trial run of the plant. The LGU-San Agustin would provide counterpart funding for land, construction of the building, installation of a 3-phase electrical system, and stable supply of filtered water. The BFAR-Romblon's counterpart in terms of training would also be solicited to ensure project deliverables are met. Direct beneficiaries of the project will also be organized, and a signatory from these beneficiaries will be designated to enter a local Memorandum of Understanding (MOU). This MOU will be crafted after the approval of project and will be forged between the LGU-San Agustin, project beneficiaries, and BFAR. Other interventions needed would be provided to ensure the project's sustainability and success.

III. OTHER SUPPORTING DOCUMENTS REQUIRED (Please refer to page 2 for the additional necessary documents.

Prepared by:

HON. ESTEBAN SANTIAGO F. MADRONA
Mayor, LGU-San Agustin, Romblon

Endorsed by:

MARCELINA V. SERVAÑEZ
Provincial S&T Director, DOST Romblon Provincial Office

Approved by:

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

DOST Form 4

DEPARTMENT OF SCIENCE AND TECHNOLOGY
Project Line-Item Budget
CY 2023

Program Title	: Grants-in-Aid (GIA)
Project Title	: Establishment of Ice Plant at Marine Fish Landing Center in Carmen Bay
Implementing Agency	: DOST-MIMAROPA
Total Duration	: 1 year for project implementation / 2 years for monitoring of outcomes
Cooperating Agency	: LGU-San Agustin
Program Leader	: Dr. Ma. Josefina P. Abilay/DOST-MIMAROPA
Project Leader	: Hon. Esteban Santiago F. Madrona Jr./LGU-San Agustin
Monitoring Agency	: DOST-MIMAROPA PSTO-Romblon

	Counterpart Funding	
	DOST-MIMAROPA	LGU-San Agustin
I. Personal Services	P	P
Sub-total for PS	P -	P -
II. Maintenance and Other Operating Expenses		
Traveling Expenses - local	15,300.00	
Training Expenses		
Traveling Expenses - local	10,000.00	10,000.00
Supplies and Materials Expenses		
Fuel, Oil and Lubricants Expenses	4,000.00	
Other Professional Services		
Printing and Publication Expenses	200.00	
Representation expenses		10,000.00
Rents-Motor Vehicles	5,000.00	
Other Professional Services		
2 plant operators @ 282/day x 28 days/mo x 36 months		284,256.00
Taxes, Insurance Premiums and Other Fees		
Insurance Expenses (0.70% of equipment value)	17,500.00	
Representation Expenses	3,000.00	
Rent/Lease Expenses	9,000.00	
Sub-Total for MOOE	P **64,000.00**	P **304,256.00**
III. Equipment Outlay		
Technical and Scientific Equipment		
Supply, Delivery, Installation, and Commissioning of the 1000 Kilograms Ice Production Facility	2,500,000.00	
Specifications:		
- Brine Tank - 3600 liters capacity tank, SS 304 Plate t=2.5mm with insulation t=100mm EPS with Cladding SS 304 sheet t=0.3mm with tank stiffener and tray support.		
- Ice Block Tray - 35 units 175mm x 150mm x 600mm tapered SS 304 plate t=1.6mm		
- Compressor - 1 unit R134a 5 tons rating open type, with electric motor 3.7 kW single phase 220VAC with high and low limit control, belted and with pulley		
- Condenser - 1 unit 5 tons capacity copper pipe 16mm diameter with copper fins, with 0.37kW fan blade motor single phase 220VAC		
- Evaporator - 1 unit 5 tons capacity copper pipe 16mm diameter		
- Refrigeration Support Components - 1 set, 5 tons capacity filter/dryer, sight glass, receiver, expansion valve, accumulator, oil separator, low/high side pressure gage.		
- Electrical Component - 1 set panel board with controller, magnetic contactor overload relay and service input breaker		
- Mobile Ice Crusher - 1 unit 15 kilograms capacity, 1.5 kW motor single phase 220VAC		
Fixed Assets		
Land and Building with 3-phase power connection & filtered water supply		3,000,000.00
Sub-Total for EO	P **2,500,000.00**	P **3,000,000.00**
GRAND TOTAL	P **2,564,000.00**	P **3,304,256.00** *

Certified Funds Available:

HERMELYN P. CRESPO
Municipal Accountant, LGU-San Agustin

XAVIER MAC DANIEL ORTIZ
Accountant III, DOST-MIMAROPA

Approved by:

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

DOST Form 5

A – PROJECT WORKPLAN

(1) Program Title: Grants-in-Aid (GIA)
(2) Project Title: Establishment of Ice Plant at Marine Fish Landing Center in Carmen Bay
(3) Project Duration (number of months): 12 months implementation & 24 months monitoring **(4) Project Start Date:** April 2023 **(5) Project End Date:** April 2024

(6) OBJECTIVES	(7) TARGET ACTIVITIES	(8) TARGET ACCOMPLISHMENTS (quantify, if possible)	Y1					Y2					Y3				
			Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total
establish a 1-ton capacity ice plant complete with technical system and accessory requirements such as crusher, 15kg-capacity ice box, agitator, 30-tonner cooling tower, 7Hp compressor, 5-tonner condenser, 5-tonner evaporator, storage facility, 2-tonner water tank, and connections from a filtered water source	Procurement, delivery, installation, and commissioning/trial-run of the facility	Established one unit 1-ton capacity ice plant complete with technical system and accessory requirements such as crusher, 15kg-capacity ice box, agitator, 30-tonner cooling tower, 7Hp compressor, 5-tonner condenser, 5-tonner evaporator, storage facility, 2-tonner water tank, and connections from a filtered water source				x	1										
conduct at least 2 training activities for ice plant operators such as proper equipment operation and maintenance/basic occupational safety and health/current good manufacturing practices, and for the San Agustin fisherfolks such as proper marine fish operation/appropriate fish post-harvest practices	Training on operation and maintenance of the facility Training on basic occupational safety and health	Conducted at least 2 training activities for ice plant operators				x	1										
allocate at least PhP2,000,000 counterpart funds from LGU-San Agustin	Signing of MOA and MOU among project stakeholders	Forged at least 1 MOA and 1 MOU among project stakeholders			x		1										
decrease expenses of fisherfolks in terms of purchasing ice by at least 10%	Operation and popularization of the of the ice plant	decreased expenses of fisherfolks in terms of purchasing ice by at least 10%						x	x	x	x	4	x	x	x	x	4
minimize fish waste due to inefficient preservations by at least 10%		minimized fish waste due to inefficient preservations by at least 10%						x	x	x	x	4	x	x	x	x	4

improve income and productivity of San Agustin fisherfolks by at least 10%		improved income and productivity of San Agustin fisherfolks by at least 10%						x	x	x	x	4	x	x	x	x	4

DOST Form 5

B – EXPECTED OUTPUTS

(1) Program Title: Grants-in-Aid (GIA)
(2) Project Title: Establishment of Ice Plant at Marine Fish Landing Center in Carmen Bay
(3) Project Duration (number of months): 12 months implementation & 24 months monitoring **(4) Project Start Date:** April 2023 **(5) Project End Date:** April 2024

(9) EXPECTED OUTPUTS (6Ps)	Y1 Objectively Verifiable Indicators (OVIs)					Y2 Objectively Verifiable Indicators (OVIs)					Y3 Objectively Verifiable Indicators (OVIs)				
	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total
Publications At least 1 feature article about the notable accomplishments of the project				x	1										
Patents/IP None															
Products None							x			1	x			x	2
People Services LGU-San Agustin, 2,038 fisherfolks				x	1										
Places and Partnerships LGU-Sal Agustin, BFAR-Romblon			x		1										
Policy At least 1 possible policy for fisherfolks to source their ice needs from the plant															
(10) POTENTIAL IMPACTS (2Is)															
Social Impact 1. Well-preserved fish means safe fish for human consumption; hence the facility would contribute to the health and wellness of the consumers. 2. Well-preserved fish would also mean fisherfolks could command higher prices for their fish catch, hence increasing their income and promoting their well-being.						x	x	x	x	4	x	x	x	x	4
Economic Impact 1. The ice plant is expected to provide 1 ton supply of ice per						x	x	x	x	4	x	x	x	x	4

production for the fisherfolks in the municipality. This supply would be sufficient to meet the need for preserving the fish for transport to target markets. 2. Sufficient supply of ice would also support the sustainability of seafood supply to consumers. 3. The presence of an ice plant in the municipality would also attract investors to invest in related industries and encourage large fish production in the municipality. Subsequently, this would result in more economic opportunities not only for fisherfolks but also for the key players in the fish industry like fish traders and processors.															

DOST Form 5

C – RISKS AND ASSUMPTIONS

(1) Program Title: Grants-in-Aid (GIA)
(2) Project Title: Establishment of Ice Plant at Marine Fish Landing Center in Carmen Bay
(3) Project Duration (number of months): 12 months implementation & 24 months monitoring **(4) Project Start Date:** April 2023 **(5) Project End Date:** April 2024

OBJECTIVES	(11) RISKS AND ASSUMPTIONS	(12) ACTION PLAN (use separate sheet if necessary)
allocate at least PhP2,000,000 counterpart funds from LGU-San Agustin	Failure of the LGU-San Agustin to provide its counterpart funds will adversely affect project implementation	Consistent follow up on the LGU's counterpart funding. Project will not be started unless building for the ice plant coming from LGU's counterpart funds is already established. A MOA will also be executed to bind counterpart funding from stakeholders.
- decrease expenses of fisherfolks in terms of purchasing ice by at least 10% - minimize fish waste due to inefficient preservations by at least 10% - improve income and productivity of San Agustin fisherfolks by at least 10%	Failure of the fisherfolks to patronize the ice plant will result to not meeting the targets on decrease in expenses, minimize of wastes, and improve in income and productivity	The LGU-San Agustin will be encouraged to craft at least 1 possible policy for fisherfolks to source their ice needs from the plant

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