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: Adoption of Portable Solar Dryers (PORTASOL) for Rice Farmer Associations in Magdiwang, Romblon

(2) Project Leader/Sex: Hon. Arthur Rey Tansiongco, MD/ Male
Agency (smallest unit)**:** LGU-Magdiwang
Address/Telephone/Fax/Email (Barangay, Municipality, District, Province, Region)**:**
Brgy. Poblacion, Magdiwang, Romblon/09088923194

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

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

(5) Project Duration (number of months): 12 months implementation, 24 months monitoring
Project Start Date: February 2023
Project End Date: February 2024

(6) Total Project Cost: PhP 860,700.00 (indicate Counterpart Funds; use Form 4 for the Line-Item Budget)

Implementing Agency/ies	PS	MOOE	Fixed Assets	Total
A. Requested Fund				
GIA		PhP 860,700.00		PhP 860,700.00
B. Counterpart Fund 1				
LGU-Magdiwang		PhP 100,000.00	PhP 500,000.00	PhP 600,000.00
TOTAL		**PhP 960,700.00**	**PhP 500,000.00**	**PhP 1,460,700.00**

II. PROJECT SUMMARY

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

The project aims to showcase the PORTASOL solar drying technology to rice farmer associations in Magdiwang, Romblon. Each of the nine (9) registered rice farmer associations (RFAs) and the LGU-Magdiwang would receive one unit of PORTASOL to increase their productivity in drying their crops and promote safer operations. The recipients are the registered and active RFAs identified by LGU-Magdiwang Municipal Agriculture Office. Below is the list of the proposed recipients of the technology and their corresponding land area and annual yield per records of the MAO-Magdiwang:

Name of RFA	Land Area (ha.)	Average Yield/Year (metric tons/year)	Average losses using traditional drying (9%) (A)	Average losses using PORTASOL (5%) (B)	Average amount of palay saved using PORTASOL (A-B)	Projected increase in income (PhP)
1. Agnocnoc	26.89	204.36	18.39	10.22	8.17	122,550
2. Agsao	14.41	112.40	10.12	5.62	4.50	67,500
3. Agutay	5.47	41.57	3.74	2.08	1.66	24,900
4. Ambulong	20.59	156.48	14.08	7.82	6.26	93,900
5. Cataja	23.12	175.71	15.81	8.79	7.03	105,450
6. Dulangan	22.34	169.78	15.28	8.49	6.79	101,850
7. Ilawod	64.9	506.25	45.56	25.31	20.25	303,750
8. Ipil	9.79	76.9	6.92	3.85	3.08	46,200
9. Jao-Asan	55.88	435.84	39.23	21.79	17.43	261,450
Total	**243.39**	**1,879.29**	**169.14**	**93.96**	**75.17**	**1,127,550**
*10. LGU-Magdiwang	*(to serve as common service facility for other small-scale farmers that are not members of the association)*					

Note: income computed at P15.00/kg palay

Most of these rice fields have their own irrigation systems and have two (2) cropping seasons in a year. The farmers also received seeds and fertilizer assistance as well as some agricultural types of machinery such as threshers from the Department of Agriculture and the LGU-Magdiwang. However, technological assistance in terms of drying was not yet given to these RFAs since they continue to apply the traditional drying method which is

sun or pavement drying along the roads. Thus, the proposal wherein cleaner and safer way of drying rice paddy would be promoted to the farmers. Moreover, this would also ease the drying efforts of rice farmers from intensive labor due to pavement drying and intermittent drying during rainy season as PORTASOL is portable and includes covers to protect rice grains from water splashes and other contaminants. Training on the operation and maintenance of PORTASOL technology will also be given. The LGU-Magdiwang through its Municipal Agriculture Office (MAO) will facilitate and coordinate with their rice farmers associations and ensure to have a facility dedicated to storage of the PORTASOL technology. Members of the association will operate the equipment by schedule in order to give equal chances to every member who would use the solar dryer which would also serve as a common service facility for each association.

(8) Introduction (Not to exceed 15 pages)

Rationale/Significance (Not to exceed 300 words)

In rice production, drying is the most critical operation after harvesting a crop. Up to 25% of moisture may be present in the rice grain when it is harvested. High moisture levels during storage can cause grain discoloration, promote the growth of molds, and raise the risk of pest attack. The rate at which rice seeds germinate may also be affected that's why it is important to dry rice paddy as soon as possible into a moisture content of 14% or less to prevent quality deterioration *(Rice Knowledge Bank, IRRI)*. Sun drying is a traditional drying method for reducing the moisture content of paddy by spreading the grains under the sun. It is the most common drying method because it is low-cost compared to mechanical drying. In Romblon, it is also the common method of drying paddy. The grains were laid on pavements or along the shoulder of the road which is both hazardous to both rice dryers and motorists. Problems of contamination and intermittent drying are generally encountered with sun drying especially during rainy season. It was also estimated that there is a total of 9% loss during pavement or sun drying.

To solve the common problem incurred with pavement or sun drying, PORTASOL technology is proposed to be deployed to rice-farmer associations of the municipality of Magdiwang in Sibuyan Island. PORTASOL is a portable and lightweight solar dryer composed of aluminum thermal trays that can be laid down on an open field or assembled into racks with a plastic sheet cover as protection from pests and fungus. Developed by Mr. Francisco Pagayon, the technology aims to eradicate this perennial problem of harvest losses and will provide fast, safe, and clean solar dryers on any ground, away from roads and highways. The technology can hold up to 150 kg of produce and its drying rate as per a study conducted on a different set of grains provide that it is 2-3 times faster than the usual method. Magdiwang, Romblon, on the other hand, is a 5th-class municipality with 3,186.60 hectares, or 37.49 percent of the total land area, set aside for agricultural use. Following the area for coconut, the municipality's rice land is 561 hectares in total. There are nine (9) registered rice farmer's associations (RFAs) in the municipality with a total land area of 243.39 hectares and an annual yield of 1,879.29 metric tons of rice paddy. The PORTASOL technology that would be provided to rice farmers in Magdiwang would increase their rice percentage recovery and head rice yield compared to traditional drying method as the technology could reduce drying losses by 5%. As a result, farmers could have additional savings of 75.17 metric tons of palay which corresponds to an additional income of P1,127,550.00. During rainy season, the PORTASOL could utilize induced heat from charcoal or rice hull cinders. It also has a canopy to cover to avoid dampness of grains thus, prevents harvest losses, and promotes higher grain quality and food hygiene.

Objectives (General and Specific)

Generally, the project aims to deploy the PORTASOL technology to rice farmers to increase their productivity and decrease post-harvest losses and contamination during drying of palay. Specifically, the project aims to:

1. Showcase 10 units of PORTASOL dryer technology to nine (9) rice farmer associations and 1 LGU in Magdiwang, Romblon;
2. Provide at least 1 training activity to the rice farmers such as equipment operation and maintenance, basic occupational safety and health, cGMP, and other related technology training opportunities;
3. Improve the dry quality of the farmers' crops and minimize contamination and yield losses during drying of *palay* by at least 5%; and
4. Improve rice farmers' productivity by at least 10%.

Methodology

Upon the approval of the project and when funds were allocated, the DOST-MIMAROPA with the help of PSTO-Romblon would facilitate the procurement of the PORTASOL technology. The unit will be housed in the designated facility of Magdiwang RFAs. They will also be responsible for the implementation of the project and the maintenance of the PORTASOL units. Other stakeholders like the Department of Agriculture will be invited to participate in the project by providing the rice farmers with agricultural production materials and/or additional operating capital for the associations. The LGU-Magdiwang MAO will also be responsible for monitoring the utilization and productivity of rice farmers after the deployment of the technology. Benchmarking from other regions will also be explored to maximize the use of the technology and learn the most effective and efficient

system for operating the technology. A memorandum of agreement between the proponent-LGU and the beneficiary-associations will also be forged to formalize the accountability of the farmer associations. A minimal maintenance fee will also be explored by each association to save money for replacement of the units when they reach their service life. The PSTO, on the other hand, will manage the project and ensure that the objectives are met. The impact of the project will also be assessed based on its objectives and will be reported after the first year of implementation.

Expected Outputs (6Ps):

The project is expected to provide an innovative solution to the perennial problems of harvest losses and to promote faster, safer, and cleaner drying methods of *palay*. In terms of physical targets, the following are expected:

Publication	None
Patent/Intellectual Property	None
Product	None
People Service	1 MAO of the LGU-Magdiwang, 9 Rice Farmers Associations
Place and Partnership	LGU-Magdiwang
Policy	None

Potential Outcomes:

- ✓ Provided PORTASOL technology to nine (9) rice farmer associations and to LGU-Magdiwang;
- ✓ Conducted at least 1 capability enhancement training activity such as equipment operation and maintenance, basic occupational safety and health, cGMP, and other related technology training opportunities;
- ✓ Increased product quality and minimized losses during drying of *palay* by at least 5%; and
- ✓ Improved rice farmers' productivity by at least 10%.

Potential Impacts (2Is):

Social Impact
The realization of the project would encourage the Magdiwang rice farmers to stop the hazardous highway drying and improve their annual yield through reduction of postharvest losses. Good and quality grains would also be produced and ease in labor for drying paddies would also be realized.

Economic impact
The technology assistance would improve the productivity of rice farmers and reduce post-harvest losses in drying rice paddies. The project would also enhance product quality and promote safe and clean drying method for rice farmers which could be translated to increase in income of the beneficiaries.

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

Some of the related projects handled by the proponent are the provision of post-harvest facilities and machinery implements (tractors, irrigation pumps, etc.) and the deployment of quality seeds to farmers. These projects were highly appreciated by the beneficiaries and are already completed successfully. The post-harvest facilities and machinery implements are still operational and maintained by the beneficiaries.

Target Beneficiaries:

The target beneficiaries of the project are rice-farmer associations in the municipality of Magdiwang with a total of 334 (as of 2022) farmer-members that could directly benefit from using the PORTASOL technology. Other farmers that are not members of the associations, on the other hand, could access the common-service PORTASOL unit deployed in the LGU-Magdiwang's Municipal Agriculture Office (MAO).

Sustainability Plan (if applicable)**:**

The DOST-MIMAROPA in partnership with the Department of Agriculture will provide relevant training and capability enhancement to the RFA beneficiaries. Project monitoring would also be done by the DOST with the assistance of the LGU-Magdiwang Office of the Municipal Agriculturist. Data such as the quantity of palay dried using the PORTASOL technology, the percent decrease in losses during drying using the technology, and the increase in income of farmers after intervention would be gathered as success indicators based on the baseline data presented above. Monthly monitoring of output will be accomplished to ensure optimum utilization of the technical assistance.

Gender and Development (GAD) Score (refer to the attached GAD checklist):

Risk analysis (refer to the attached risks and assumptions):

(9) Workplan (See Form 5)

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

The DOST-MIMAROPA through the PSTO-Romblon will provide technical assistance for the procurement of the PORTASOL technology. The office would also provide capability building for the RFAs through training activities and consultancy. The LGU-Magdiwang MAO will be responsible for monitoring the RFA beneficiaries for the utilization of the technology and will report the data to the PSTO-Romblon as reference in the assessment of the impact of the project. Moreover, one of the responsibilities of the rice-farmers associations that would be included in the MOA is to provide housing for the PORTASOL unit and to ensure its optimum utilization as well as facilitate its repair and maintenance.

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

Prepared by:

HON. ARTHUR REY TANSIONGCO, MD
Mayor, LGU-Magdiwang

Endorsed by:

MARCELINA V. SERVANEZ
Provincial S&T Director, PSTO Romblon

Approved by:

Digitally signed by Abilay Ma. Josefina Pormento

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

DOST Form A

DEPARTMENT OF SCIENCE AND TECHNOLOGY

Project Line-Item Budget

CY 2023

Program Title	: Grants-in-Aid (GIA)
Project Title	: Adoption of Portable Solar Dryers (PORTASOL) for Rice Farmer Associations in Magdiwang, Romblon
Implementing Agency	: LGU-Magdiwang
Total Duration	: 1 year for project implementation/ 2 years for monitoring of outcomes
Program Leader	: Dr. Ma. Josefina P. Abilay/DOST-MIMAROPA
Project Leader	: Hon. Arthur Rey Tansiongco, MD/LGU-Magdiwang
Monitoring Agency	: DOST-MIMAROPA PSTO Romblon

		Counterpart Funding	
		DOST-MIMAROPA	LGU-Magdiwang
I.	**Personal Services**	P	P
	Sub-total for PS	**P -**	**P -**
II.	**Maintenance and Other Operating Expenses**		
	Traveling Expenses - local	200,000.00	
	Training Expenses		
	Traveling Expenses - local	14,500.00	
	Supplies and Materials Expenses	10,000.00	
	10 units Grain Moisture Meters		50,000.00
	Fuel, Oil and Lubricants Expenses	2,800.00	
	Other Professional Services	200.00	
	Printing and Publication Expenses	6,600.00	
	Representation expenses	18,000.00	
	Rents-Motor Vehicles		
	Supplies and Materials		
	Office supplies	25,000.00	
	Semi-Expendable-Equipment Expenses		
	10 sets Multi-crop drying equipment-PORTASOL (36,500/unit)	365,000.00	
	Specifications: with 12 stackable trays/set, 150kg capacity/set		
	Fuel, Oil and Lubricants Expenses	5,000.00	
	Postage and Courier Expenses	10,000.00	
	Internet Subscription Expenses (2099+3500+999/mo x 12 mos)	80,000.00	
	Representation Expenses	55,000.00	
	Transportation and Delivery Expenses	3,600.00	50,000.00
	Rent/Lease Expenses	65,000.00	
	Sub-Total for MOOE	**P 860,700.00**	**P 100,000.00**
III.	**Equipment Outlay**		
	Fixed Assets		
	Land and Building	P	P 500,000.00
	Sub-Total for EO	**P -**	**P 500,000.00**
	GRAND TOTAL	**P 860,700.00**	**P 600,000.00**

Certified Funds Available:

AVEGAIL CRISOSTOMO
Accountant, LGU-Magdiwang

XAVIER MAC DANIEL ORTIZ
Accountant III, DOST-MIMAROPA

Approved by:

Digitally signed by Abilay Ma. Josefina Formento

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: Adoption of Portable Solar Dryers (PORTASOL) for Rice Farmer Associations in Magdiwang, Romblon
(3) Project Duration (number of months): 12 months implementation & 24 months monitoring **(4) Project Start Date:** February 2023 **(5) Project End Date:** February 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
Showcase 10 units of PORTASOL dryer technology to nine (9) rice farmer associations and 1 LGU in Magdiwang, Romblon	Turn over activity of the PORTASOL dryer technology to the rice farmer associations and the LGU-Magdiwang	Deployed 10 units PORTASOL to the 9 rice farmer associations and to the LGU-Magdiwang (1 for each beneficiary)			x		1										
Provide at least 1 training activity to the rice farmers such as equipment operation and maintenance, basic occupational safety and health, cGMP, and other related technology training opportunities	Training on equipment operation and maintenance and/or training on Basic Occupational Safety and Health (BOSH)	At least 1 training activity to the rice farmers such as equipment operation and maintenance, basic occupational safety and health, cGMP, and other related technology training opportunities			x		1										
Improve the dry quality of the farmers' crops and minimize contamination and yield losses during drying of palay by at least 30%	Comparison study on the dry quality of crops and yield losses before and after use of the PORTASOL	At least 30% improvement on the dry quality of crops and at least 30% decrease in yield losses				x	1										
Improve rice farmer's productivity by at least 30%	Monitoring of the PORTASOL operation among the rice farmer associations and the LGU Tap other project stakeholders like DA, and DA-ATI to provide more interventions to the farmer associations	At least 30% increase in productivity of the rice farmers			x x	x x	2 2	x x	x x	x x	x x	4 4	x x	x x	x x	x x	4 4

DOST Form 5

B – EXPECTED OUTPUTS

(1) Program Title: Grants-in-Aid (GIA)
(2) Project Title: Adoption of Portable Solar Dryers (PORTASOL) for Rice Farmer Associations in Magdiwang, Romblon
(3) Project Duration (number of months): 12 months implementation & 24 months monitoring **(4) Project Start Date:** February 2023 **(5) Project End Date:** February 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															
Patents/IP															
Products															
People Services			x	x	2										
Places and Partnerships			x		1										
Policy															
(10) POTENTIAL IMPACTS (2Is)															
Social Impact											x	x	x	x	4
Economic Impact						x	x	x	x	4	x	x	x	x	4

DOST Form 5

C – RISKS AND ASSUMPTIONS

(1) Program Title: Grants-in-Aid (GIA)
(2) Project Title: Adoption of Portable Solar Dryers (PORTASOL) for Rice Farmer Associations in Magdiwang, Romblon
(3) Project Duration (number of months): 12 months implementation & 24 months monitoring **(4) Project Start Date:** February 2023 **(5) Project End Date:** February 2024

OBJECTIVES	(11) RISKS AND ASSUMPTIONS	(12) ACTION PLAN (use separate sheet if necessary)
Improve the dry quality of the farmers' crops and minimize contamination and yield losses during drying of palay by at least 5%	Failure of some rice farmers to religiously use the PORTASOL technology will result in high contamination in crops and yield losses during traditional drying methods.	The LGU-Magdiwang through its MAO would be encouraged to develop a schedule/utilization plan of the PORTASOL based on the harvest season and drying periods to give equal opportunities to farmers. Also, the LGU-Magdiwang would be encouraged to duplicate the technology to saturate all the farmers.