

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: Grant in Aid**

Project Title: Improving Access to Safe Drinking Water through Water Desalination in Barangay Maniwaya,
Sta. Cruz, Marinduque

(2) Project Leader/Sex: Analiza C. Romasanta / Female / Punong Barangay

Agency (smallest unit): Sangguniang Barangay of Maniwaya

Address/Telephone/Fax/Email (Barangay, Municipality, District, Province, Region):

Brgy. Maniwaya, Sta. Cruz, Marinduque

(3) Cooperating Agency/ies (Name/s and Address/es):

DOST-MIMAROPA

4th floor, PTRI Bldg. Bicutan, Taguig City

Sangguniang Barangay of Maniwaya

Brgy. Maniwaya, Sta. Cruz, marinduque

(4) Implementing Agency (Name of University-College-Institute, Department/Organization or Company):

Sangguniang Barangay of Maniwaya

Address/Telephone/Fax/Email (Barangay, Municipality, District, Province, Region):

Brgy. Maniwaya, Sta. Cruz, marinduque

Base Station: Brgy. Maniwaya, Sta. Cruz, marinduque

Other Implementation Site (s):

(5) Project Duration (number of months): _____

Project Start Date:

Project End Date:

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

Implementing Agency/ies	PS	MOOE	CO & EO	Total
A. Requested Fund				
DOST-MIMAROPA	0.00	338,298.00	3,860,900.00	4,199,198.00
B. Counterpart Fund 1				
BLGU MANIWAYA	126,000.00	325,000.00	1,150,000.00	1,601,000.00
TOTAL	126,000.00	663,298.00	5,010,900.00	5,800,198.00

Sustainable Development Goal (SDG) Addressed

- SDG 6: Clean Water and Sanitation – The project aims to provide a sustainable and affordable source of clean and safe drinking water for the residents of Barangay Maniwaya, addressing the challenge of water scarcity and improving access to safe water.
- SDG 8: Decent Work and Economic Growth – By creating local employment opportunities for the community through the operation of the desalination facility, the project promotes economic growth and supports livelihoods.
- SDG 11: Sustainable Cities and Communities – The project contributes to building sustainable communities by ensuring access to clean water, which improves overall health and well-being in Barangay Maniwaya.
- SDG 13: Climate Action – The desalination technology utilized in the project can help address challenges posed by climate change, such as water scarcity, by providing a reliable, renewable source of potable water.

II. PROJECT SUMMARY

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

Barangay Maniwaya, Sta. Cruz, Marinduque, faces a critical shortage of safe drinking water, with most residents relying on costly mainland-sourced water or unsafe shallow wells. The proposed solution is the establishment of a seawater reverse osmosis desalination facility that will produce 6 cubic meters of clean, potable water daily, providing affordable and safe drinking water to 100% of the population. The project will be funded through DOST-MIMAROPA, with the Barangay Local Government Unit (BLGU) providing counterpart funds, land, and support for operations and maintenance. The expected outcome is improved access to clean water, reduced water costs for residents, creation of local employment opportunities, and long-term sustainability of the facility through proper training and management.

(8) Introduction (Not to exceed 15 pages)

Rationale/Significance (Not to exceed 300 words)

Introduction

As an island province, Marinduque frequently faces challenges in accessing fresh water for domestic and potable use. According to the National Economic and Development Authority (NEDA, 2019), many barangays in the region, particularly those in Geographically Isolated and Disadvantaged Areas (GIDA), lack adequate access to safe drinking water, posing significant health and economic challenges to local communities.

To address this, a significant milestone was achieved with the inauguration of the first DOST-funded water desalination project in the country on April 19, 2022, in Barangay Mongpong, Sta. Cruz, Marinduque. This project provided a sustainable solution to the community's lack of safe drinking water through reverse osmosis desalination technology. The success of the Mongpong project inspired similar initiatives in other GIDA areas in the region, including Barangay Maniwaya, Sta. Cruz, Marinduque.



Barangay Maniwaya, an island barangay with a population of 1,687 or 445 households based on their 2024 barangay profile, is situated approximately 10 kilometers from Buyabod Port, requiring a 30–45 minute ride by motorized banca. Approximately 90% or 1518 residents rely on purified water transported from the mainland, costing PHP 50.00 per 20-liter container. This amounts to around 80 containers per day, or PHP 4,000.00 in daily expenses. Households unable to afford purified water depend on shallow wells (*tabsing*) as their source of drinking water, which is both unreliable and unsafe. This dependency places a financial and logistical burden on the community and increases the risk of waterborne diseases.

To address these challenges, the proposed project will provide Barangay Maniwaya with a water desalination system using reverse osmosis technology. This system efficiently removes dissolved salts and minerals through a combination of high-pressure pumps, energy recovery devices, and specialized membranes, ensuring a sustainable supply of safe and potable water.

The implementation of this project is expected to yield significant benefits, including improved access to safe drinking water, reduced costs for residents, and increased productivity by freeing up time spent acquiring water. Furthermore, the project will benchmark lessons learned from the successful Mongpong initiative to ensure effective implementation.

This initiative is aligned with the National Innovation Agenda and Strategy Document (NIASD) 2023–2032, Pagtanaw 2050, and the Harmonized National Research and Development Agenda (HNRDA). By

addressing critical water resource challenges, it contributes to national goals of health and well-being, sustainable development, and improved living conditions in GIDA areas.

Objectives (General and Specific):

The general objective of this project is to provide Barangay Maniwaya, Sta. Cruz, Marinduque, with a sustainable and affordable source of safe drinking water through a desalination facility, improving community health, reducing water costs, creating local employment, and ensuring long-term operational sustainability.

Specifically, the project aims to:

1. Establish a water desalination facility in Barangay Maniwaya capable of producing 2 cubic meters of clean and potable water daily by 2025.
2. Provide affordable and safe drinking water to 100% of Barangay Maniwaya's population, reducing reliance on costly mainland-sourced water within the first year of operation.
3. Generate two employment opportunities for residents by hiring and training facility operators to ensure efficient and sustainable operations.
4. Reduce the financial and logistical burden on residents by decreasing household water expenses by at least 50% within the project's first year.

Methodology:

The water desalination project for Barangay Maniwaya was developed in response to the community's pressing need for a sustainable and accessible source of drinking water. The initiative originated when the Barangay Local Government Unit (BLGU) of Maniwaya raised concerns about the ongoing water scarcity in the area. After recognizing the importance of addressing this challenge, DOST-MIMAROPA, in collaboration with PSTO Marinduque, decided to implement a solution using reverse osmosis desalination technology.

The project began with an initial meeting between the main stakeholders, including the BLGU of Maniwaya, the Provincial Health Office (PHO), and other relevant community leaders. During this meeting, a Training Needs Assessment (TNA) was conducted to identify the specific requirements for operating and maintaining the desalination system. This allowed the project team to gain a deeper understanding of the community's needs and any logistical or financial challenges that might arise.

Following this, a meeting was held with the Sangguniang Barangay of Maniwaya to discuss the project in detail, including the financial obligations and responsibilities of the beneficiaries. This meeting was essential in ensuring that the BLGU understood the potential costs involved and could allocate the necessary counterpart funds, including those for the construction of the production building, deep well, supplies, and the ongoing repair and maintenance of the equipment.

Once the meeting concluded, the project proposal was prepared, and all required documents were submitted for review. Upon approval, funds were allocated, and the procurement process for the desalination equipment was initiated.

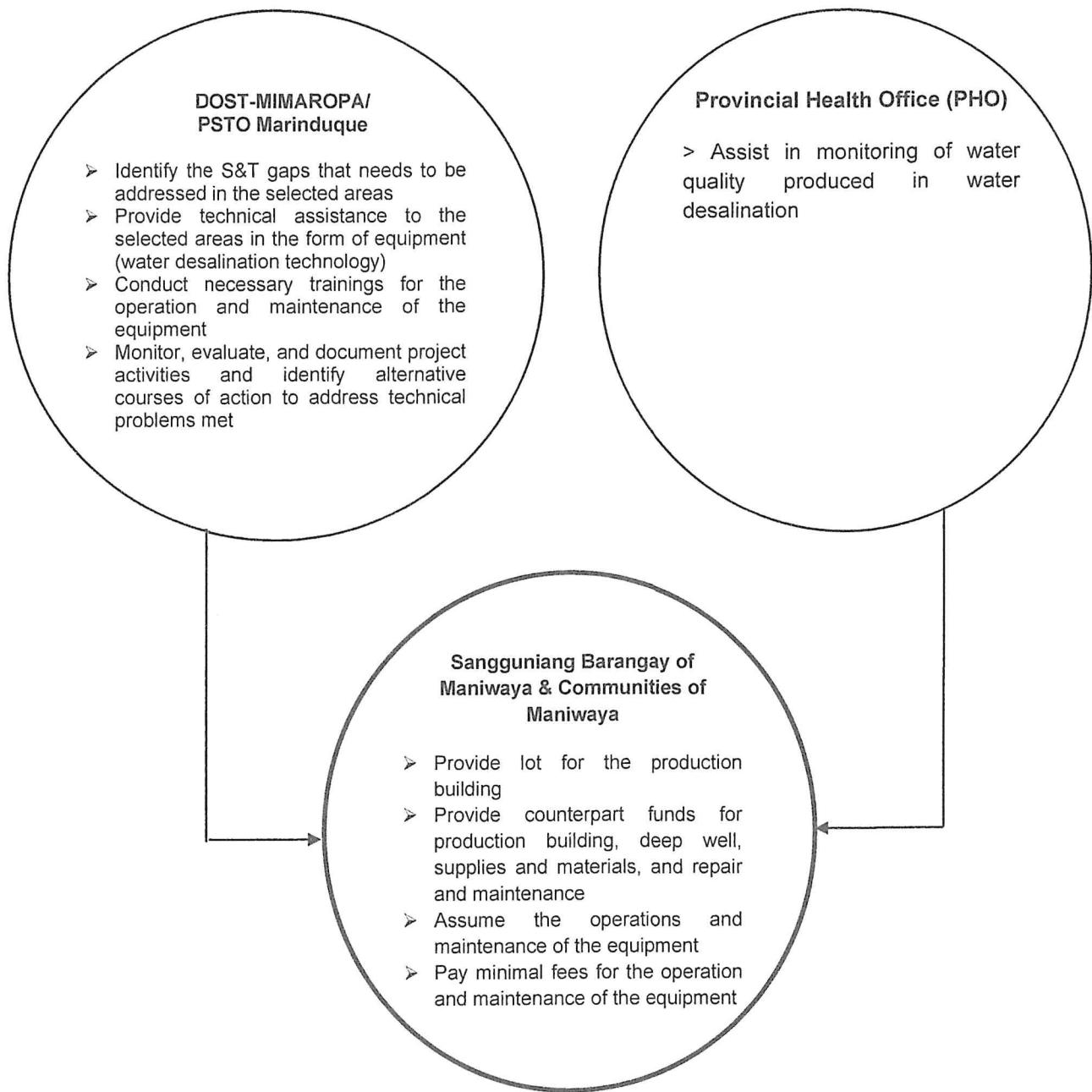
DOST-MIMAROPA, through PSTO Marinduque, will oversee the entire project implementation, including providing technical assistance, managing the installation of the desalination equipment, and conducting the necessary training for local operators to ensure the proper functioning of the system. Additionally, the PHO will assist in monitoring the quality of water produced by the desalination system to ensure it meets health and safety standards.

The BLGU of Maniwaya, as the primary beneficiary, will manage the procurement of materials, secure the site for the production building, and take responsibility for the equipment's operation and maintenance. They will also assign a focal person to oversee the system's day-to-day operation.

Meanwhile, the Sangguniang Barangay, together with the local communities, will provide the counterpart funding for the production building, deep well, and other essential materials, as well as for the system's repair and maintenance. The Barangay will also ensure that users pay minimal fees for the service, which will contribute to the long-term sustainability of the project.

This collaborative approach will ensure that the project effectively meets the needs of Barangay Maniwaya, providing reliable access to safe drinking water while empowering the community to manage and maintain the system in the long run.

CONCEPTUAL FRAMEWORK



Expected Outputs (6Ps):

Publication	At least 1 publication by the end of the project (MIMAROPA STARS or other publications).
Patent/Intellectual Property	N/A
Product	Readily available desalinated safe drinking water.
People Service	Two (2) workers have been hired to manage the water desalination facility.
Place and Partnership	Forged MOA between DOST-MIMAROPA and Brgy. Maniwaya.
Policy	Brgy. Maniwaya crafted ordinance for the charging of minimal fee to the communities to ensure the operation, maintenance, and sustainability of the project.

Potential Outcomes:

The potential outcomes of this project include significant improvements in access to safe drinking water, as the establishment of the desalination facility will provide a reliable, sustainable, and affordable water source for Barangay Maniwaya's population, leading to better public health and reduced waterborne diseases. By decreasing reliance on costly mainland-sourced water, household water expenses are expected to drop by at least 50% within the first year of operation, relieving financial burdens on residents. The consistent supply of potable water will also enhance the community's overall well-being and quality of life.

In addition, the project will create two local employment opportunities, providing residents with valuable training in facility operations, contributing to local economic growth, and strengthening community capacity. By adopting best practices from the successful Mongpong desalination project, the initiative will ensure long-term sustainability, reducing the need for ongoing external support. Finally, the environmental impact of transporting water from the mainland will be minimized, and the desalination facility will offer a more sustainable solution for water procurement, further contributing to the community's development and environmental goals.

Potential Impacts (2Is):

Social Impact

Access to clean water will reduce waterborne diseases and improve the health of residents. The project will also empower the community by providing training and involving them in managing the facility. This will improve the quality of life by saving time and money spent on fetching water from distant sources.

Economic Impact

The project will create jobs for residents and boost the local economy by reducing the cost of water for households. It will also lower water expenses for families, allowing them to save money for other needs. In the long run, the desalination facility can become self-sustaining, benefiting the community financially.

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

The Sangguniang Barangay of Maniwaya is a recipient of DOST-MIMAROPA CEST program in the year 2020. The said project was intended to provide technical assistance in form of solar powered water pumping station that will provide water supply to Sitio America 1 and Sitio America 2. The project implementation was completed within the project duration and the water supply for domestic use was realized by the constituents of Sitio America 1 and Sitio America 2 in the year 2021.

Target Beneficiaries:

Sustainability Plan:

- Four hundred forty-five households composed of 1,687 residents are targeted to have sustainable access to purified water. According to the World Health Organization, a person needs 50–100 liters of water per day to meet their basic needs and maintain good health. This water should be safe for drinking, washing, cooking, and other domestic uses. For basic hygiene and food hygiene, the WHO recommends 20 liters per person per day. Furthermore, WHO recommends a minimum of 4.6L of water intake per person for those with moderate physical activity at warm temperature. With this, it can be estimated that around 7,760L of water is required by the population for drinking alone equivalent to 388 pieces of 20L-containers. With a capacity of 2000L per 8 hours operation, the water desalination system is expected to produce 100 containers per day.
- Each container has an estimated production cost (including consumables, labor, electricity, miscellaneous fees, and depreciation) of PHP 21.90 and will be sold at PHP 25.00. With an estimated monthly production and sales of at least 2,600 containers (100 containers for 6-day operation per week or 26 days per month), a monthly net income of PHP 8,060.00 can be generated, which can be used for maintenance.

- Conduct of the supplier's technical training for the designated staff for water desalination operations and maintenance.s
- The Brgy. Maniwaya will allot funds for personal services to ensure that there will be continuous operation until such time that the project is self-liquidating.
- Partnering with other NGOs / NGAs to tap complementary resources for the project.
- Advocacy / IEC from the benefits of this technology is addressing water scarcity to generate more support for the project
- PHO to conduct monthly water analysis to ensure the safety of the product.
- Regular conduct of monitoring and evaluation
- Establish strong linkage with the supplier for the after sales service.

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

(9) Workplan (See Form 5)

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

DOST-MIMAROPA, through the Provincial Science and Technology Office (PSTO) Marinduque, will lead the project's implementation, providing technical assistance and oversight. This includes the procurement of the desalination equipment, conducting training on the operation and maintenance of the facility, and ensuring the project meets quality standards. DOST-MIMAROPA will also monitor the progress of the project and address any technical issues that arise.

The Barangay Local Government Unit (BLGU) of Maniwaya will be responsible for providing the land for the facility and allocating counterpart funds for the construction of the production building, deep well, and equipment maintenance. The BLGU will oversee the operation and management of the desalination facility and ensure its long-term sustainability by hiring and training local operators.

The community members of Barangay Maniwaya will play a vital role by providing labor for the construction and operation of the facility. They will also be responsible for paying minimal fees for the operation and maintenance of the desalination system. Additionally, they will participate in training programs to manage the facility effectively and ensure its continued success.

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



DOST Form 4

DEPARTMENT OF SCIENCE AND TECHNOLOGY
Project Line-Item Budget
CY 2024-2025

Program Title : Grants-in-Aid
Project Title : Improving Access to Safe Drinking Water through Water Desalination in Barangay Maniwaya, Sta. Marinduque
Implementing Agency : Sangguniang Barangay of Maniwaya
Total Duration : December 2024 - December 2025 (12 months)
Current Duration : December 2024 - December 2025
Cooperating Agency : DOST-MIMAROPA, SB of Maniwaya
Program Leader : Dr. Ma. Josefina P. Abilay
Project Leader : Hon. Analiza C. Romasanta
Monitoring Agency : DOST-MIMAROPA

		Counterpart Funding	
		DOST-MIMAROPA	
		To be transferred	To be retained
P	P	P	P
I. Personal Services	Sub-total for PS		
II. Maintenance and Other Operating Expenses			
Traveling Expenses - local			50,000.00
Training Expenses			10,000.00
Traveling Expenses - local			13,000.00
Representation expenses			
Rents-Motor Vehicles			
Supplies and Materials			
Office supplies			15,000.00
Medical, Dental and Laboratory Supplies Expenses			
Semi-Expendable-Machinery Expenses			
Semi-Expendable-Equipment Expenses			30,000.00
Fuel, Oil and Lubricants Expenses			
Other Supplies and Materials Expenses			
500 pcs water containers 20liter capacity	75,000.00	75,000.00	
Consumables (Media Filter Tank, Pre Filter, Maintain Filter, RO System Anti Scalant (Flocon), Reverse Osmosis Membrane, Disinfection System UV Light 2 gpm, Chlorine Calcium Hypo)	100,000.00	100,000.00	
Communication Expenses			
Postage and Courier Expenses			8,205.00
Telephone Expenses - Mobile			11,099.00
Internet Subscription Expenses			11,994.00
Repairs and Maintenance	100,000.00		10,000.00
Taxes, Insurance Premiums and Other Fees			4,000.00
Transportation and Delivery Expenses			
Other Maintenance and Operating Expenses	50,000.00		
Sub-Total for MOOE	P 325,000.00	P 175,000.00	P 163,298.00
III. Equipment Outlay			
Sea Water Reverse Osmosis (SWRO)			
1. Pre-Treatment Unit for SWRO			
2. Sea Water Reverse Osmosis Unit			
3. Disinfection and Cleaning Unit			
4. Instrumentation and Control			
5. Raw and Product Water Tanks - 4000Li		3,860,900.00	P
6. Deep Well Booster Water Supply			
7. 15KVA Generator set			
8. Distribution Product Supply			



DOST Form 4

DEPARTMENT OF SCIENCE AND TECHNOLOGY
Project Line-Item Budget
CY 2024-2025

Program Title : Grants-in-Aid
Project Title : Improving Access to Safe Drinking Water through Water Desalination in Barangay Maniwaya, Sta. Marinduque
Implementing Agency : Sangguniang Barangay of Maniwaya
Total Duration : December 2024 - December 2025 (12 months)
Current Duration : December 2024 - December 2025
Cooperating Agency : DOST-MIMAROPA, SB of Maniwaya
Program Leader : Dr. Ma. Josefina P. Abilay
Project Leader : Hon. Analiza C. Romasanta
Monitoring Agency : DOST-MIMAROPA

	Sub-Total for EO	P	-	P	3,860,900.00	P	-
IV Capital Outlay							
Land			100,000.00				
Drilling for Water Source		P	300,000.00				
Production Building including Electrical Supply			750,000.00	P			
Sub-Total for CO		P	1,150,000.00	P		-	P
GRAND TOTAL		P	1,601,000.00	P	4,035,900.00	P	163,298.00

Note: * price of equipment/supplies has allowance for possible price increase.

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

Prepared by:

ANALIZA C. ROMASANTA
Punong Barangay
Sangguniang Barangay of Maniwaya

Edorsed by:

BERNARDOT T. CARINGAL
Provincial S&T Director
PSTO-Marinduque

Certified Funds Available

NOELITA D. QUEZADA
Treasurer
Sangguniang Barangay of Maniwaya

JAY RALPH A. CABIAO
Accountant III
DOST-MIMAROPA

Approved by:

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



DOST Form 4

DEPARTMENT OF SCIENCE AND TECHNOLOGY
Project Line-Item Budget
CY 2024-2025

Program Title : Grants-in-Aid
Project Title : Improving Access to Safe Drinking Water through Water Desalination in Barangay Maniwaya, Sta. Marinduque
Implementing Agency : Sangguniang Barangay of Maniwaya
Total Duration : December 2024 - December 2025 (12 months)
Current Duration : December 2024 - December 2025
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Monitoring Agency : DOST-MIMAROPA

ITEM
Water Desalination Equipment
5. Water Tanks
5.1 Raw Water Material: PE Storage Tanks Capacity: 40001i
5.2 Product Water Material: PE Storage Tanks Capacity: 40001i
6. Deep Well Booster Water Supply
6.1 Deep Well Pump Rating: 1 Hp Centrifugal Pump and motor 220V, 60Hz, 1Phase Capacity: Q=2.8m³/hr, H=15m
6.2 Wires and Cables Interconnection to plant sites electrical wires and insulation
Wiring Insulation PVC Piping and Fittings
6.3 Auxillaries 1 set of Foot Valves 1" with 50ft PVC pipe 1" and fitting for deep well; 900 m to PE Tubing and fittings from well to plant Site; 2 sets of Liquid Level Switch; 1 set Outdoor Type NEMA3R Weatherproof Control Panel complete with circuit breaker, magnetic contactor, overload relay, pilot lamps and switches; 1 set MS Skid Frame for control panel and Booster Pump, epoxy painted
7. Generator Set Capacity: 15 KVA, 220V, 60Hz, 1phase
Labor for Operations
Production Building
Repair and Maintenance
500pcs containers
Consumables (Media Filter Tank, Pre Filter, Maintain Filter, RO System Anti Scalant (Flocon), Reverse Osmosis Membrane, Disinfection System UV Light 2 gpm, Chlorine Calcium Hypo)
2 pcs Water Tank
Distribution Water Supply



DOST Form 5
A – PROJECT WORKPLAN

(1) Program Title: GRANT-IN-AID

(2) Project Title: Improving Access to Safe Drinking Water through Water Desalination in Barangay Maniwaya, Sta. Marinduque
 (3) Project Duration (number of months): 12 months
 (4) Project Start Date: 2025 (5) Project End Date: 2026

(6) OBJECTIVES	(7) TARGET ACTIVITIES (quantify, if possible)	(8) TARGET ACCOMPLISHMENTS (quantify, if possible)	Y1				Y2				Y3			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1. Establish a water desalination facility in Barangay Maniwaya capable of producing 2 cubic meters of clean and potable water daily by 2025.	<ul style="list-style-type: none"> Evaluate the current water supply situation and demand in Barangay Maniwaya. Assess potential sites for the facility based on accessibility, environmental impact, and proximity to water sources. 	Establish reliable production of potable water and provide enough water to meet the needs of at least 100–200 individuals daily, based on an average consumption of 10–20 liters per person.					X							
2. Provide affordable and safe drinking water to 100% of Barangay Maniwaya's population, reducing reliance on costly mainland-sourced water within the first year of operation.	<ul style="list-style-type: none"> Estimate the current water consumption patterns and identify the population's needs. 	Improve access to safe drinking water for 100% of households in Barangay Maniwaya and reduction in time and effort required by residents to obtain potable water, particularly for vulnerable groups such as women and children.					X	X						
3. Generate two (2) employment opportunities for residents by hiring and training facility operators to ensure efficient and sustainable operations.	<ul style="list-style-type: none"> Create a comprehensive training program covering essential skills for operating and maintaining the desalination facility. 	Create local employment and promote economic empowerment through the skill development of trained operators who will manage the full operation of the project.												
4. Reduce the financial and logistical burden on residents by decreasing household water expenses by at least 50% within the project's first year.	<ul style="list-style-type: none"> Conduct a detailed analysis of existing household water expenses, including purchase of bottled or delivered water and costs of fetching 	Achieve a 50% reduction in household water expenses within the first year of the project by implementing a sustainable water supply system, monitoring its operational efficiency, and ensuring accessibility for all target households.					X	X						

DOST Form 5
B – EXPECTED OUTPUTS

(1) Program Title: GRANT-IN-AID

(2) Project Title: Improving Access to Safe Drinking Water through Water Desalination in Barangay Maniwaya, Sta. Marinduque

(3) Project Duration (number of months): 12 months

(4) Project Start Date: 2025 (5) Project End Date: 2026

(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			1	1	1										
Patents/IP					None										
Products				1	1										
People Services			1	1	1										
Places and Partnerships	1			1	1										
Policy				1	1										
(10) POTENTIAL IMPACTS (2Is)															
Social Impact															
Economic Impact															

Access to clean water will reduce waterborne diseases and improve the health of residents. The project will also empower the community by providing training and involving them in managing the facility. This will improve the quality of life by saving time and money spent on fetching water from distant sources.

The project will create jobs for residents and boost the local economy by reducing the cost of water for households. It will also lower water expenses for families, allowing them to save money for other needs. In the long run, the desalination facility can become self-sustaining, benefiting the community financially.

DOST Form 5
C – RISK MANAGEMENT PLAN

(1) Program Title: GRANT-IN-AID

(2) Project Title: Improving Access to Safe Drinking Water through Water Desalination in Barangay Maniwaya, Sta. Marinduque

(3) Project Duration (number of months): 12 months

(4) Project Start Date: 2025 (5) Project End Date: 2026

OBJECTIVES	(11) RISKS AND ASSUMPTIONS	(12) RISK MANAGEMENT PLAN (use separate sheet if necessary)
1. Establish a water desalination facility in Barangay Maniwaya capable of producing 2 cubic meters of clean and potable water daily by 2025.	R- High initial cost of purchasing, installing, and commissioning the desalination facility may exceed budget projections. A- Secured adequate funding to cover capital and operational expenses.	Provide flexibility in the budget to manage unexpected expenses without compromising the project's scope.
2. Provide affordable and safe drinking water to 100% of Barangay Maniwaya's population, reducing reliance on costly mainland-sourced water within the first year of operation.	R - maintaining consistent and safe water quality, especially during peak demand. A- desalination technology will be reliable, producing consistent, high-quality potable water without significant issues.	Ensure the desalination system is protected from poor water quality, especially during environmental changes
3. Generate two employment opportunities for residents by hiring and training facility operators to ensure efficient and sustainable operations.	R- lack of local residents with the required skills or willingness to work as facility operators. A- sufficient number of qualified or trainable local residents interested in the facility operator roles.	Attract skilled workers and retain them by offering more than just base pay, including benefits like job security, growth opportunities, and job satisfaction.
4. Reduce the financial and logistical burden on residents by decreasing household water expenses by at least 50% within the project's first year.	R- The sustainable water supply system may face operational challenges, such as equipment breakdowns or insufficient water availability, which could hinder its ability to reduce household water expenses as planned. A- The target households will actively adopt and utilize the sustainable water supply system, ensuring the expected cost savings and reduction in logistical burdens.	Implement regular maintenance, establish backup water sources, and allocate emergency funds to ensure uninterrupted system operation and achieve the 50% cost reduction goal.