

**APPLICATION FOR TECHNOLOGY NEEDS ASSESSMENT**

Name of Enterprise: Marinduque State College, Institute of Agriculture		
Contact Person: Harvey Dulay	Position in the Enterprise: <i>Assistant Professor 1</i>	
Office Address: Poctoy, Torrijos, Marinduque	Tel. No. 09284104181	Fax No.
	E-mail Address:	
Factory Address: Poctoy, Torrijos, Marinduque	Tel. No.	Fax No.
	E-mail Address:	
Website:		

**GENERAL AGREEMENTS:**

1. The applicant shall, at the earliest opportunity, make available to the DOST Regional Office MIMAROPA (DOST MIMAROPA) all information (manuals, procedures, etc.) required to establish the technology status of the selected core business functions and management systems;
2. If DOST MIMAROPA is not satisfied that all the requirements for business registration are complied with, it shall inform the applicant of the observed deficiencies before starting the assessment;
3. When the required inputs to the assessment are already supplied by the applicant, including Attachment A, the DOST MIMAROPA will assess the firm through the core business functions and management systems, whichever is applicable, to identify technology needs and verify compliance to standards vis-à-vis existing practices;
4. When the DOST MIMAROPA has completed the technology assessment, a report will be prepared on the results of the assessment with accompanying recommendations and opportunities for improvement. The report prepared will define the scope of activities, functions, management practices and locations assessed. The applicant shall not claim or otherwise imply that the report applies to other locations, product or activities not covered by the report;

5. The applicant agrees that the report will not be used until permission has been granted by the DOST MIMAROPA;
6. The applicant agrees that the receipt or acknowledgment of the report ends the assessment stage; any technical assistance ensuing from the recommendations of the report will be viewed as a separate project.

#### **UNDERTAKING**

**I agree to undertake and observe the above General Agreements as stipulated by the Department of Science and Technology Regional Office MIMAROPA**



**HARVEY DULAY**

**Signature over Printed Name**

**ASSISTANT PROFESSOR 1**

**Position in the Enterprise**

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**Date**

**Enterprise Profile**

Name of Enterprise Marinduque State College, Institute of Agriculture

Production Site/Location Poctoy, Torrijos, Marinduque

Business Permit No. \_\_\_\_\_ Year Registered \_\_\_\_\_

Brief Enterprise Background \_\_\_\_\_

One of the mature technologies being used for modern agriculture is tissue culture. This technology provides high yield and uniformity (in terms of shape, size, weight, and color) unlike the traditional method which usually does not meet the commercial demand.

Farmers using conventional banana farming methods are now encountering issues such as slow growth rate, low yields, high mortality rates, and struggle in propagating a disease-free uniform suckers. The said problems could be linked to different factors such as absence of disease-free banana planting materials and the farmer's lack of knowledge when it comes to modern cultivation techniques.

Based on the 2018 Provincial Commodity Investment Plan (PCIP Marinduque), there are 4,500 hectares of land in the province which is planted with banana. For every hectares of land, an estimated of 400 banana (saba) or 1,111 banana (lakatan) that can be planted. It is also reported that there are 13,533 farmers engaged in the production of banana.

Asides from farmers, there are local food processors who are also dependent to the production of banana. Among these processors includes (insert 3 sisters, Rejanos, etc.) which generate banana-products and job opportunities for the province. Furthermore, banana have been part of the local delicacies of Marinduque, this creates local demand for banana.

In the previous years, Marinduquenos had an experience of strong typhoons which destroys the banana plantations. This disrupts the continuous production, forcing the increase in price of banana and importation from other provinces. To address this concern, the timing of planting and immediate replacement of banana plants must be implemented.

In view of this, the establishment of a banana tissue culture laboratory and nursery is an intervention that could aid in the recovery of banana industry in the province. With the production of readily available uniform, disease-free banana planting materials, farmers in the different areas can plan for planting schedule to avoid seasons where typhoon can damage plantations. MSC through the province agriculture office will provide quality planting materials. Thus, this proposal.

Year enterprise was established: \_\_\_\_\_ Initial capitalization: \_\_\_\_\_

Type of Organization: ☐ Single proprietorship  
☐ Cooperative  
☐ Partnership  
☐ Corporation

☐ Profit

☐ Non-profit

☐ LGU

Enterprise Registration No. \_\_\_\_\_ Year Registered \_\_\_\_\_

Classification according to capital (PhP) Present capitalization \_\_\_\_\_

☐ Micro (less than 1.5 M)

☐ Small (1.5 – 15 M)

☐ Medium (15 – 100 M)

Classification according to employment (number of employees)

☐ Micro (1 – 9)

☐ Small (10 – 99)

☐ Medium (100 – 199)

Number of Employees:

Direct Workers M:\_\_\_ F:\_\_\_

Production M:\_\_\_ F:\_\_\_

Non-production M:\_\_\_ F:\_\_\_

Indirect/Contract Workers M:\_\_\_ F:\_\_\_

Total M:\_\_\_ F:\_\_\_

Business Activity:

☐ Food processing (please specify commodity) \_\_\_\_\_

☐ Furniture (please specify commodity) \_\_\_\_\_

☐ Gifts, decors, handicrafts (please specify commodity) \_\_\_\_\_

☐ Metals and engineering (please specify commodity) \_\_\_\_\_

☒ Agriculture/Marine/Aquaculture (please specify commodity) \_\_\_\_\_

☐ Health products and pharmaceuticals (please specify commodity) \_\_\_\_\_

☐ Information and Communications Technology (ICT) products (please specify commodity) \_\_\_\_\_

☐ Others, please specify \_\_\_\_\_

1. Specific product or service the enterprise offers its customers:

Marinduque State College is committed to maintaining the highest degree of excellence in the field of Instruction, Research, Extension and Production towards meeting customer satisfaction by adhering to globally-adopted quality standards.

2. Reasons why assistance is being sought:

- Farmers that still use traditional banana farming practices are experiencing problems

such as slow growth rate, low yields, high mortality rates.

- Struggle in propagating a disease-free uniform suckers.

3. Have you consulted any other individual/organization for any assistance?

☐ If Yes, which company/ agency?

Please specify the type of assistance sought

☐ / If No, why not?

Organizational Structure

- *See attached*

4. Enterprise's plan for the next 5 years?

- To establish tissue culture laboratory for banana.

- To locally produce 22,400 tissue-cultured banana planting materials per year for farming communities in the province.

- To engage at least 50 farmers in banana production per year

Next 10 years?

- To supply tissue cultured banana planting materials to nearby province.

- To engage all banana farmers in the province to banana production

- To produce other banana products in the province

5. Current agreements and alliances undertaken

None

**BENCHMARK INFORMATION**

▪ **Production and Supply Chain**

- Raw Material

Raw Material	Source	Unit Cost (₱)	Volume Used/Year
N/A			

- Production

Product	Volume of Production/Year	Unit Cost of Production (₱)	Annual Cost of Production (₱)
N/A			

➤ Existing Functional Production Equipment

Type of Equipment	Specifications	Capacity	No. of Units	Year Acquired
NONE				

➤ Production Problems and Concerns

There is no available laboratory for tissue cultured banana in the province.

➤ Production Waste Management System

The waste material coming from the facility will be disposed properly

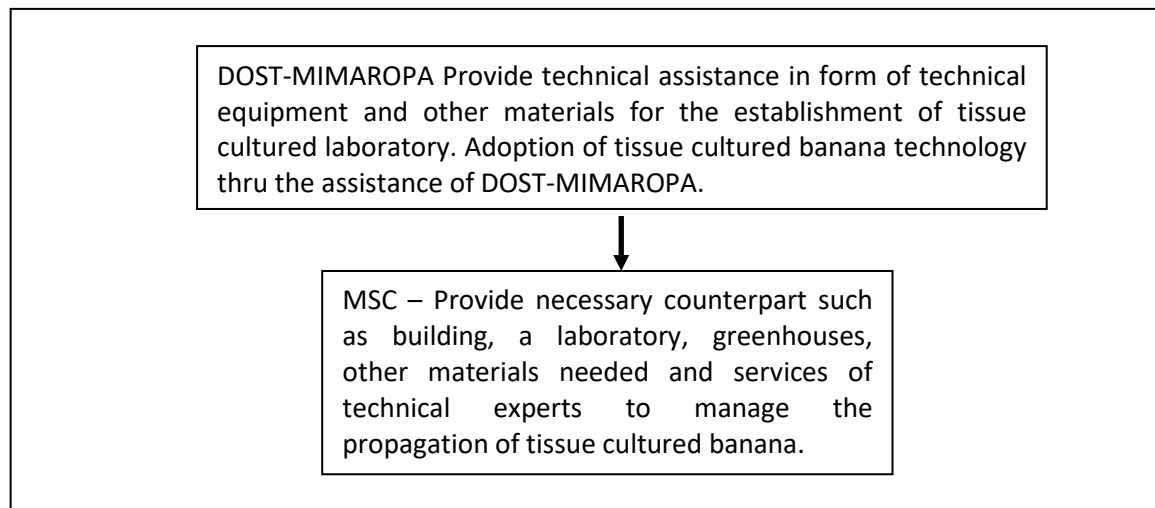
➤ Production Plan

The banana tissue culture laboratory will be established at the Institute of Agriculture, MSC-Torrijos. This facility will be used for R&D, instruction and production activities. MSC will also assign permanent staff who will oversee the project and a contractual employee as laboratory technician for the actual day to day operations in the laboratory.

➤ Plant Lay-Out

- See attached production lay-out

➤ Process Flow



➤ Inventory System

None

➤ Maintenance Program

The assigned staff will follow the preventive maintenance plan for all the equipment and ensure the cleanliness of the laboratory thru proper scheduling

➤ cGMP/HACCP Activities

Personnel that will be assigned to the facility will be equipped with proper training on tissue cultured banana laboratory management.

➤ Supplies/Purchasing System

N/A

▪ Marketing

➤ Marketing Plan

The tissue cultured laboratory for banana will be handled by 1 laboratory technical and 1 nursery worker. It is estimated that with this number of persons working in a 5 days a



week basis they could produce 1,866 pcs a month of plantlets or **22,400** a year. If the laboratory could produce 14,000 lakatan and 8,400 saba and can sell it at **₱ 30.00** for lakatan and **₱ 35.00** for saba it could generate an income of **₱ 420,000.00** and **₱ 294,000.00** for a total of **₱ 714,000.00** a year. An average of **₱ 59,500.00** monthly gross income can be generated with a net income of **₱ 14,976.91**

➤ **Market Outlets and Number**

The MSC plans to market its produce to local farmers at reasonable price.

➤ **Promotional Strategies**

1. Demonstration sites.
2. Social media, tarpaulins, radio, t.v. and other promotional materials will be used to promote the product.

➤ **Market Competitors**

No existing competitor within the province who's into production of tissue cultured banana.

➤ **Packaging**

- |                        |     |
|------------------------|-----|
| ○ Nutrition Evaluation | N/A |
| ○ Bar Code             | N/A |
| ○ Product Label        | N/A |
| ○ Expiry Date          | N/A |

▪ **Finance**

➤ **Cash Flow or other related documents**

Finances will be handled by the assigned staff. MSC will provide or separate account for the said project to ensure the funds that will be earned are solely allotted for the sustainability of the project.

➤ Source(s) of capital/credit

MSC will provide funds for the renovation of the facility, greenhouse facility, personal services, supplies and materials for tissue culture laboratory.

➤ Accounting System

There is existing budget and accounting department which ensures the proper utilization of the budget.

▪ **Human Resources**

➤ Hiring and Criteria

MSC will assign project coordinator for the management and operations of the project

➤ Incentives to Employees

None

➤ Training and Development

MSC staff that will be assigned for the facility will be equipped with necessary skills thru DOST-MIMAROPA.

➤ Safety Measures Practiced

Safety standards will be strictly followed

➤ Other Employee Welfare

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None

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▪ Other Concerns

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None

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Prepared by:



**HARVEY DULAY**

Printed Name and Signature of  
Owner/Chair/Representative

October 05, 2021

Date

Validated by:



**BERNARDO T. CARINGAL**


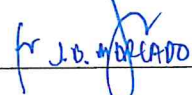
Printed Name and Signature of  
PSTD/Cluster Manager

October 05, 2021

Date

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TECHNOLOGY NEEDS ASSESSMENT (TNA) REPORT	
<b>COMPANY:</b>	Marinduque State College, Institute of Agriculture
<b>ADDRESS:</b>	Poctoy, Torrijos, Marinduque
SCOPE OF ASSESSMENT*	
<p>The TNA covered the following areas:</p> <ol style="list-style-type: none"> <li>1. Strategic Direction <ol style="list-style-type: none"> <li>a. Vision and mission</li> <li>b. Plans and Objectives</li> <li>c. Strategic alliances and current agreement</li> </ol> </li> <li>2. Management Aspect <ol style="list-style-type: none"> <li>a. Human resource management</li> <li>b. Purchasing</li> <li>c. Work environment</li> <li>d. Corporate social responsibility</li> <li>e. Occupational health and safety management</li> </ol> </li> <li>3. Technical Aspect <ol style="list-style-type: none"> <li>a. Operational and outsourcing practices <ul style="list-style-type: none"> <li>-production system</li> <li>-production planning and control</li> <li>-production lay-out</li> <li>-work improvement</li> <li>-equipment management and maintenance</li> <li>-quality assurance system</li> <li>-outsourcing practices</li> </ul> </li> <li>b. Product and Process Performance and Improvement <ul style="list-style-type: none"> <li>-reengineering and Research and Development</li> <li>-Procedures for continuous improvement</li> <li>-Product Quality standards</li> </ul> </li> <li>c. Environmental Management System <ul style="list-style-type: none"> <li>-Waste management</li> </ul> </li> </ol> </li> <li>4. Marketing Aspect <ol style="list-style-type: none"> <li>a. Marketing plan</li> <li>b. Market outlets and number</li> <li>c. Promotional strategies</li> </ol> </li> </ol>	

Reported by <u>BERNARDO T. CARINGAL</u>	Signature <u></u>	Date <u>10/05/21</u>
Name of TNA Team Leader		
Attested by <u>JERRY MERCADO</u>	Signature <u></u>	Date <u>10/12/21</u>
Name of ARD		

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d. Market competitors

e. Packaging


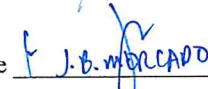
5. Finance

a. Cash flow and other related documents

b. Sources of capital

c. Accounting system

**\* Scope of TNA is based on Technology Assessment Plan (TAP)**

Reported by	<u>BERNARDO T. CARINGAL</u>	Signature	<u></u>	Date	<u>10/05/21</u>
	Name of TNA Team Leader				
Attested by	<u>JERRY MERCADO</u>	Signature	<u></u>	Date	<u>10/12/21</u>
	Name of ARD				

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## Summary of Assessment

### Background

One of the mature technologies being used for modern agriculture is tissue culture. This technology provides high yield and uniformity (in terms of shape, size, weight, and color) unlike the traditional method which usually does not meet the commercial demand.


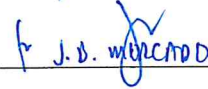
Farmers using conventional banana farming methods are now encountering issues such as slow growth rate, low yields, high mortality rates, and struggle in propagating a disease-free uniform suckers. The said problems could be linked to different factors such as absence of disease-free banana planting materials and the farmer's lack of knowledge when it comes to modern cultivation techniques.

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In the previous years, Marinduquenos had an experience of strong typhoons which destroys the banana plantations. This disrupts the continuous production, forcing the increase in price of banana and importation from other provinces. To address this concern, the timing of planting and immediate replacement of banana plants must be implemented.

In view of this, the establishment of a banana tissue culture laboratory and nursery is an intervention that could aid in the recovery of banana industry in the province. With the production of readily available uniform, disease-free banana planting materials, farmers in the different areas can plan for planting schedule to avoid seasons where typhoon can damage plantations. MSC through the province agriculture office will provide quality planting materials. Thus, this proposal.

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Attested by <u>JERRY MERCADO</u> Name of ARD	Signature <u></u>	Date <u>10/12/21</u>



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### Methodology

The facility will be used for R&D, instruction and production activities. MSC will assign permanent staff who will oversee the project and a contractual employee as laboratory technician for the actual day to day operations in the laboratory.

A nursery for banana plantlets will be established in MSC and at least two employees of MSC will be assigned to managed it.

The MSC will then coordinate with PGM- PAgrIO and six municipalities for the distribution of the tissue cultured banana that are ready for field transplanting. To promote high adoption rate of farmers a subsidy will be provided to the purchase of planting materials.

MSC School of Agriculture staff conduct training and consultancy activities.

### Summary of Findings

#### 1. Strategic Direction


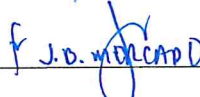
##### a. Vision and mission

Vision – An advanced and adaptive university pursuing quality education, lifelong gender-sensitive learning environment, transparent governance with sustainable resource generation by 2025

Mission – To provide excellence in instruction, research, extension and production that magnifies W.I.S.D.O.M. in leadership through a total quality management system responsive to the challenges of 21st century education.

##### b. Plans and Objectives

Marinduque State College is committed to maintaining the highest degree of excellence in the field of Instruction, Research, Extension and Production towards meeting customer satisfaction by adhering to globally-adopted quality standards.

Reported by <u>BERNARDO T. CARINGAL</u> Name of TNA Team Leader	Signature <u></u>	Date <u>10/05/21</u>
Attested by <u>JERRY MERCADO</u> Name of ARD	Signature <u></u>	Date <u>10/12/21</u>

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*c. Strategic alliances and current agreements*

MSC has collaborative agreement to Local and National Government agency for the different projects implemented and to be implemented.

## 2. Management Aspect

*a. Human resources*

MSC will assign permanent staff who will oversee the project and a contractual employee as laboratory technician for the actual day to day operations in the laboratory.

*b. Purchasing*

Equipment for the laboratory will be procured by DOST-MIMAROPA while other materials such as raw materials will be brought from MSC.

*c. Business Ethics and Social Responsibility*

The MSC needs technical support for the provision of tissue culture laboratory for banana that will benefit the community.


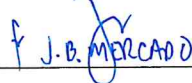
## 3. Technical Aspect

*a. Operational and Outsourcing Practices*

Production system

Assigned permanent staff will oversee the project and a contractual employee as laboratory technician will do the actual day to day operations in the laboratory.

Production Planning and Control

Reported by	<u>BERNARDO T. CARINGAL</u> Name of TNA Team Leader	Signature		Date	<u>10/05/21</u>
Attested by	<u>JERRY MERCADO</u> Name of ARD	Signature		Date	<u>10/12/21</u>



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MSC permanent staff and laboratory technician will follow the standard operating procedure of the tissue cultured laboratory for banana.

Production Layout

See attached production layout.

Work Study/Improvement

Continuous research will be done for further improvement.

Equipment Management and Maintenance

Equipment that will be acquired for the tissue cultured laboratory will be used and maintained thru following the scheduled management and maintenance.

Quality Assurance System

At present there is no quality assurance system.

*b. Product and Process Performance and Improvement*

Performance Measures and Results – Process

N/A


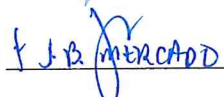
Performance Measures and Results – Product

N/A

*c. Environmental Management System*

Waste Management

Waste materials will properly dispose.

Reported by <u>BERNARDO T. CARINGAL</u> Name of TNA Team Leader	Signature <u></u>	Date <u>10/05/21</u>
Attested by <u>JERRY MERCADO</u> Name of ARD	Signature <u></u>	Date <u>10/12/21</u>

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#### 4. Marketing Aspect

##### a. Marketing Plan

The MSC together with PGM-PAgriO will support the promotion and marketing of the products.

##### b. Market Outlets

MSC will engage at least 50 farmers in banana production per year.

##### c. Promotional Activities

MSC will use tarpaulins and social media platform for the promotion. However, the PGM-PAgriO will be promoting the project during important Municipal and Provincial activities.

##### d. Market Competitors

The project is pioneering in the province hence there is no competitor.


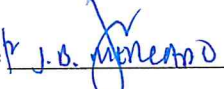
#### 5. Finance

##### a. Source of capital/credit

DOST-MIMAROPA will provide the technical assistance in form of equipment and materials for tissue cultured laboratory.

##### b. Accounting System

Proper accounting system will be implemented to ensure appropriate utilization of budget.

Reported by <u>BERNARDO T. CARINGAL</u> Name of TNA Team Leader	Signature <u></u>	Date <u>10/05/21</u>
Attested by <u>JERRY MERCADO</u> Name of ARD	Signature <u></u>	Date <u>10/12/21</u>

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**CONCLUSIONS:**


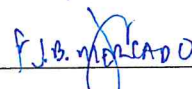
Based on the interview and ocular inspection the TNA team concludes the following;

1. Marinduque State College needs for technical assistance in form of equipment for tissue cultured laboratory.
2. The needed assistance is timely and would enable the MSC to meet its vision and mission.

**RECOMMENDATIONS:**

The following are recommended by the TNA team:

1. The DOST-MIMAROPA should reach out to help the MSC for the establishment of tissue cultured laboratory.
2. Support the MSC in marketing plan to ensure the stability of the project.

Reported by <u>BERNARDO T. CARINGAL</u> Name of TNA Team Leader	Signature <u></u>	Date <u>10/25/21</u>
Attested by <u>JERRY MERCADO</u> Name of ARD	Signature <u></u>	Date <u>10/27/21</u>