

PROJECT MATRIX

Table 1. HEI and Project Brief

PROPONENT:	Mabalacat City College- <i>Institute of Arts and Sciences</i>	RANKING:	LUC II - Region III
PROJECT TITLE AND PROJECT DURATION	<p><i>Alleviating the Quality and Quantity of Life on the Freshwater Ecosystem</i></p> <p>24 Months</p>		
PROJECT GENERAL DESCRIPTION AND RATIONALE	<p>Introduction</p> <p>The eruption of Mt Pinatubo in 1991 had a profound impact not only on the agricultural lands of Mabalacat City but also the river ecosystem, resulting in the burial of the once vibrant Sapang Balen river under layers of lahar. Despite the passage of three decades, the river has yet to fully recover, but signs of life have started to emerge. Consequently, it is imperative that a comprehensive study is conducted to explore methods for reviving this lost ecosystem.</p> <p>In light of this, the focus area for this project will be the Sapang Balen river, situated in Mabalacat City within the province of Pampanga, Central Luzon, Philippines. The river can be precisely located at a latitude of 15.24245° or 15° 14' 33" north and a longitude of 120.59244° or 120° 35' 33" east, with an elevation of 76 meters.</p> <p>Among the three major bodies of water that traverse Mabalacat City, namely the Sacobia river, Sapang Balen, and Quintangil river, there remains limited information concerning species diversity, water quality, and physicochemical status within the Sapang Balen river. It is worth noting that this project seeks to rectify this dearth of data, providing crucial insights that will contribute to the conservation and restoration of the river. Therefore, the primary objective of this endeavor is to enhance the overall quality and quantity of life for the fauna and flora inhabiting freshwater ecosystems.</p> <p>This project proposes a thorough investigation into the revival and conservation efforts of the Sapang Balen river, which suffered severe damage as a result of the Mt Pinatubo eruption in 1991. By addressing the existing knowledge gaps regarding species diversity, water quality, and physicochemical conditions, this study aims to rejuvenate the river and foster the proliferation of flora and fauna.</p>		

Objectives of the Project

This project targets the restoration of Sapang Balen river, in terms of the quality and quantity of the flora and fauna.

Specifically this project will meet the following objectives :

1. What is the current status of Sapang Balen River in terms of;
 - A. Physical;
 - B. Chemical; and
 - C. Biological?
2. What are the identified species of flora and fauna in Sapang Balen River?
3. Are there significant differences in the results of assays/tests conducted in the freshwater ecosystems namely;
 - A. Physicochemical parameters;
 - B. Potability;
 - C. Trace of Microplastic; and
 - D. Trace of Heavy metals?
4. What are the intervention strategies to be applied in the Sapang Balen River to alleviate the quality and quantity of the freshwater ecosystems?
 - A. Phytoremediation using Aquatic Macrophytes;
 - B. Application of Activated Carbon generated from Balakat Tree;
 - C. Charcoal briquettes derived from Water Hyacinth;
 - D. Installation of Modified filter revetment; and
 - E. Application of Plant-based flocculants.
5. What are strategic policies to be implemented relative to the betterment of flora and fauna of Sapang Balen river?

Target Outcomes

The main outcomes of this project are as follows:

1. Identify the status of Sapang Balen river in terms of physical, chemical, and biological aspects.
2. Identify and characterized the species of flora and fauna inhabiting the Sapang Balen river.
3. Understand the significant differences in the results of test/assay conducted on Sapang Balen river in terms of physiochemical composition, potability, trace of microplastic and heavy metals.
4. Strategize the applicable interventions to alleviate the quality and quantity of the freshwater ecosystems.

	<ol style="list-style-type: none"> 5. Establish policies to sustain the freshwater ecosystem in Sapang Balen river. 6. Encourage and generate future collaborative actions towards resilient, renewable, and regenerative water management projects in the region. 7. Ameliorate the ecological services provided by the Sapang Balen to the neighboring community/Mabalacat City. 8. Strengthen the recreational activities on the Communities of Mabalacat City. 9. Preserve the heritage of Sapang Balen of Mabalacat City. 10. Publications from the research study of the Sapang Balen river. <p>Target Beneficiaries</p> <p>The main beneficiaries of this project will be the following:</p> <ol style="list-style-type: none"> 1. LGUs located within the scope area of the project. 2. Local communities and other stakeholders of the selected river systems; 3. Government agencies and NGOs in the selected areas; and 4. Professors and students from partner state Colleges/Universities. <p>The project will be conducted in Sapang Balen, Mabalacat City, Pampanga. The stream traverses the Clark Area, and the barangays of Poblacion, Sta. Ines, and Mamatitang. All necessary tests will be initiated by CRL Environmental Corporation, Department of Science and Technology and Science Laboratory of Mabalacat City College.</p> <p>Preliminary assessment of the Sapang Balen river will be conducted in terms of chemical, physical, and biological status. Followed by the potability test, phytoremediation using aquatic macrophytes, application of activated carbon, calorimetry test, installation of alternative revetment, and introduction of bio flocculants.</p>
<p>RESPONSIVENESS TO UN SUSTAINABLE DEVELOPMENT GOALS AND AMBISYON 2040</p>	<p>This project entitled “River Restoration: Alleviating the quality and quantity of life on freshwater ecosystem”, targets the SDG goals for the restoration, conservation, and promotion of sustainability for all inhabitants of Sapang Balen, Mabalacat City, Pampanga. In addition, this project encapsulates the United Nations Sustainable Development Goals such as SDG 2 (Zero hunger), SDG 3 (Good health and Well-being), SDG 4 (Quality Education), SDG 6 (Clean Water and Sanitation), SDG 8 (Decent work and Economic Growth), SDG 9 (Industry Innovation and Infrastructure), SDG 11 (Sustainable Cities and Communities), SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action) SDG 14 (Life Below Water), SDG 15 (Life on Land) and SDG 17 (Partnerships for the Goals).</p>

Table 2. Project Logical Framework

PROPONENT:	Mabalacat City College - <i>Institute of Arts and Sciences</i>		
PROJECT TITLE:	Alleviating the Quality and Quantity of Life on the Freshwater Ecosystem		
BUDGET:	P5.0 M		
BENEFICIARIES:	<p>The main beneficiaries of this project will be the following:</p> <ol style="list-style-type: none"> 1. LGUs located within the scope area of the project. 2. Local communities and other stakeholders of the selected river systems; 3. Government agencies and NGOs in the selected areas; and 4. Professors and students from partner state Colleges/Universities. 		
INPUTS	PROCESS	OUTPUTS	OUTCOMES
<p>A. Sapang Balen River and 5 selected areas for assessment and rehabilitation</p> <p>B. Research Team</p> <p>C. Partnership with Mabalacat City ENRO and LGUs</p> <p>D. GIS and Remote Sensing Laboratory</p> <p>E. Soil Assessment Tools and Equipment</p> <p>F. Water Assessment Tools and Equipment</p> <p>G. Biodiversity Assessment Tools and Equipment</p> <p>H. Survey Instruments (Habitat and Local Community Assessment)</p> <p>I. Vulnerability Assessment Tools</p> <p>J. Budgetary Resources</p>	<p>A. Ocular visitation and site mapping using GIS and RS</p> <p>B. Preliminary assessment of the physical, chemical, and biological status of the five study areas:</p> <ul style="list-style-type: none"> • Characterization and authentication of terrestrial and aquatic flora and fauna. • Physicochemical assessment of river substrate and water quality • Climate and land use mapping and assessment <p>C. Socio-economic Characterization</p> <ul style="list-style-type: none"> • Mabalacat City Water Use Assessment 	<p>A. Mapped sites of Sapang Balen River and its surrounding community</p> <p>B. Identified flora and fauna species</p> <p>C. Biodiversity Map for Terrestrial and Aquatic Areas</p> <p>D. Characterized physical parameters (river dimensions, soil layers/substrates, route, disturbances)</p> <p>E. Water Quality Assessment</p> <p>F. Mapped land use and assessment</p> <p>G. Climate Data</p> <p>H. Political delineation of the Municipality and LGUs</p> <p>I. Socio-demographic</p>	<ol style="list-style-type: none"> 1. Comprehensive and detailed river characterization for Sapang Balen (SDGs 14 and 15); 2. Emphasis on historical and biological importance of local river system in Mabalacat City (SDGs 2, 3, 4, 6, 14, and 15); 3. Water and soil management plans and interventions (SDGs 3, 11, 12, 14, 15, and 17); 4. Mitigation plans for the maintenance and conservation of the local river system (SDGs 3, 11, 12, 14, 15, and 17);

	<ul style="list-style-type: none"> • Vulnerability Assessment • Political Delineations • Economic Impact Assessment 	<p>profiles of residents</p> <p>J. Vulnerability Index of the communities within the selected areas</p> <p>K. Management Plans for Mitigation and Intervention</p> <p>L. Recommendations for sustainability projects and preservation of water quality (briquette-making and coagulation-flocculation studies)</p>	<ol style="list-style-type: none"> 5. Identified prospects for economic progress through livelihood generation (SDGs 6, 8, 11, 12, and 17); 6. Developed and trained experts relevant to river assessment and environmental conservation (SDGs 4, 14, and 15); and 7. Establishment of partnerships and linkages for current and future collaborations towards sustainable communities and a healthy environment (SDG 11 and 17). 8. Enhancement of the ecological services provided by the reservoir. 9. Preservation of the heritage of Mabalacat City.
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Figure 1 below elucidates the framework that will be employed on the study. The selected river (Sapang Balen, Mabalacat City) will be the study area and be divided different subsites. On

the first phase, all protocols will be administered to obtain preliminary data of the biological and physicochemical of the river. Furthermore, after obtaining the preliminary data, interventions will be executed to alleviate the quality and quantity of life on the chosen river. On the phase of the project, sustainability will be the target of this project - to ensure this, a proposal will be sent to the College President of the Mabalacat City College to allow this project as one of the extension program of the Institute of Arts and Sciences. In addition, Memorandum of Understanding will be settled on the nearby Barangays to ensure the sustainability and implementation of the project.



RIVER RESTORATION

Phase 1
Ocular visit and launching of the project. This phase involves the preliminary tests of different parameters concerning to the ways on how to restore the Sapang Balen.

Phase 2
Search for funding and LGU collaboration. This will allow the project to proceed to advance tests such as heavy metal, formulation of briquettes and activated carbon, and such.

Phase 3
Continuity/sustainability of the project to ensure that the project is impactful.

The infographic features a light green background with a vertical dotted line on the left. To the right, there are two overlapping photographs: the top one shows a clear, flowing river in a forested area, and the bottom one shows a large fish leaping out of the water, creating a splash.

Figure 1. The framework of the project.

Physical and chemical tests of the briquettes																															
Formulation and application of plant-based flocculant																															
Installation of filter revetment in selected area of the rivers.																															
“Sustainability of the Project”	Confirmatory Tests: <i>Reassessment of the various parameters to verify the effectivity and sustainability of the interventions.</i>																														

Table 4. Total Project Cost/Proposed Budget (With detailed Line-Item Budget)

ITEMS/PARTICULARS	CHED SUPPORT	COUNTER SUPPORT/HEI

LINE-ITEM BUDGET

Project Title:	<i>River Restoration: Alleviating the Quality and Quantity of Life on Freshwater Ecosystem</i>	
Project Leader:	Marilyn S. Arcilla, RN, MAN	
Proponent:	Mabalacat City College	
Duration:	24 months	
	DETAILS	24 MONTHS (PHP)
I. Professional Services (Honoraria/Salaries)		
A. Project Leader	8,800/month	211,200.00
1. Project Staff	7,000/month	168,000.00
B. Study Leader 1 (Biological parameters)	5,500/month	132,000.00
C. Study Leader 2 (Chemical parameters)	5,500/month	132,000.00
D. Study Leader 3 (Physical parameters)	5,500/month	132,000.00
Research Associate	21,500/month	516,000.00
Research Associate	21,500/month	516,000.00
SUBTOTAL		1,807,200.00
II. Maintenance and Other Operating Expenses		
A. Travel to study sites	TEV @ PHP 1,000 x 6 persons x 30 days	180,000.00
B. Equipment, Supplies, and Materials		2,000,000.00
C. Fuel/Gasoline	PHP 1,000 x 30 trips x 1 car	30,000.00
D. Professional Services		
1. Biological Parameters	At least 2 trainings/workshops	50,000.00
2. Physical Parameters		100,000.00
3. Water Quality Parameters		100,000.00
E. Food Expenses	Project meetings	133,000.00
F. Attendance to Conferences/Fora	Transportation and Conference Fees	250,000.00
G. Publication		50,000.00

SUBTOTAL		2,893,000.00
III. Contingency Fund		50,000.00
IV. Administrative Cost	(@5% of Total project cost)	250,000.00
TOTAL		5,000,200.00

Table 5. Contact details of persons or officer in-charge

NAME	DESIGNATION	INSTITUTION	ROLE IN THE PROJECT	Email Address and Viber Number
Marilyn S. Arcilla	Dean, Institute of Arts and Sciences	Mabalacat City College	Project Leader	
Glen S. Nolasco	Program Head, BSBIO	Mabalacat City College	Study Leader	glen.nolasco@mcc.edu.ph CP # 0948-687-8573

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