



THE ROAD TO RIVER REHABILITATION

A 5 YEAR INTEGRATED RIVER REHABILITATION PLAN

(5YR IRRP – Medium-term)

CY 2022 – 2027

Butuanon and Mahiga Rivers

Mandaue City

**MANDAUE CITY ENVIRONMENT AND NATURAL
RESOURCES OFFICE (MCENRO)**

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A. INTRODUCTION

CITY PROFILE:

Mandaue City is a Highly Urbanized City (HUC) in the island province of Cebu Philippines. The City is one of the smallest cities in land area with only 32.85 sq kms, with approximately 364 thousand people across 27 barangays.

Our vision is to be a resilient city driven by manufacturing based, retail and services MSMEs by 2027. With Performance Governance System or PGS, our city strategy map was designed aligned to that vision.

PGS Strategy Map file link: <https://bit.ly/3rp9wka>



Under the Environmental Sustainability Roadmap of our Strategy Map, there are 5 Key Result Areas (KRAs) namely;

- Mangrove Protection,
- Rehabilitation of the Closed Dumpsite,
- Solid Waste Management,
- Pollution Control Management and
- River Rehabilitation for both Butuanon and Mahiga rivers**

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EARLY WINS:

Hosting the 4th International River Summit (IRS) gave the City the timely and unique opportunity to create a shared value for our river and craft the goal; “Raise Awareness, Raise Commitment, Raise Resources” During the 4th IRS indeed awareness levels were raised tremendously through all the activities of the Summit. Soon after, the City received numerous commitments to help clean up, study, promote the river and basically join the cause. The momentum may have waivered due to the pandemic but by then the Butuanon River already gained supporters. Raising resources is one of the reasons why this plan has been proposed.

Even with the pandemic, with help from partners like the CORDAID , Wetlands International and the Institute for Climate and Sustainable Cities (ICSC), the City was able to craft our Climate Change Adaptation Framework (CCAF) which was the basis for our approved LCCAP.

One of the highlights of the CCAF was the identification of our 4 Systems of Interest (SOI) or problem areas for prioritization namely: vulnerable communities, water resources, wetland ecosystems and supply chain

The City has also laid out plans such as the recently approved Comprehensive Land Use Plan (CLUP), the 10yr Ecological Solid Waste Management Plan and the Local Shelter Plan among others.

Programs and projects such as the Green Building Program and studies such as the Baseline Assessment of the Mangrove Community Structure have also been identified as landmark initiatives.

All of these are aligned to the vision which also support low carbon model development as well as protect overall health of our ecosystems.

All plans and programs file link: <https://bit.ly/3gmR71a>

Both rivers are identified as green corridors of the City according to our approved CLUP. Both are considered public open green spaces that deserve front yard transformation versus its current backyard state.

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COMPREHENSIVE LAND USE PLAN
2019-2029

SECTION 12.16. Regulations in Green Corridor Zone (GC-Z). - These are buffer areas along the major rivers namely: Butuanon River and Subangdaku River, to allow space for protection of river banks and service roads on both sides which will be considered as no-build zones except for allowable uses provided below.

Allowable Uses

- Plant nurseries
- Ground-level or underground parking structures/ facilities
- Agriculture, silviculture, horticulture
- Customary accessory uses incidental to any of the above such as offices, eateries/ canteens, parking, kiosks, retail stores and toilet facilities

Building Density and Bulk Regulations

- Per the relevant provisions of the NBC, the Water Code, and this Ordinance.
- The Building Height Limit is 9 meters above highest grade or maximum of 2 storeys.
- Subject to the provisions of Section 16 of this Ordinance, as applicable.
- Establish Green Corridor along major waterways and coastal lines
 - a. River improvements are to include:
 - i. Channel improvement
 - ii. Construction of mini dams
 - iii. Discharge channels
 - iv. Access and side roads
 - v. Revetments, greening and natural filters

PRIORITY PROGRAMS & PROJECTS

ISSUE: Environment (Flooding, Pollution, and Waste Management)
OBJECTIVE: Sustainable Environment
 Ensure environmental sustainability by embracing comprehensive green practices.

STRATEGY:

Water and flooding

- Formulate water quality and resource management policies
 - a. Moratorium on the issuance of deep well permits; exceptions shall be issued by the National Water Resource Board (NWRB)
 - b. Existing deep wells shall still be allowed for those with prior permits, however, its usage shall be limited to the restrictions of the said permit
 - c. Rain water storage and infiltration facility in every building
 - d. Permeable pavements and landscape areas for all land developments
- Establish Green corridor along major waterways and coastal lines

- Preserve natural water ways in private properties (Waterway overlay)
- Preserve wetland area (Cabancalan sink hole)
- Preserve mangrove areas (Paknaan & Labogon)
- Mitigation on toxic waste (i.e. used oil, batteries, etc.)
- Formulate policies on water recycling (i.e. car wash, water refilling businesses, and restaurants)

Our Butuanon river Eco-Fence project, a public-private partnership, was installed to protect portions of the river banks from destructive effects of human presence. To raise awareness of the presence of a degraded river that plays a very important role for wetland ecosystem, also a public-private partnership project, viewing decks have been installed.

CONSTRUCTION

OF

VIEWING DECK

PHASE - 1



BEFORE & AFTER





BEFORE & AFTER






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CONSTRUCTION OF
VIEWING DECK

PHASE - 2



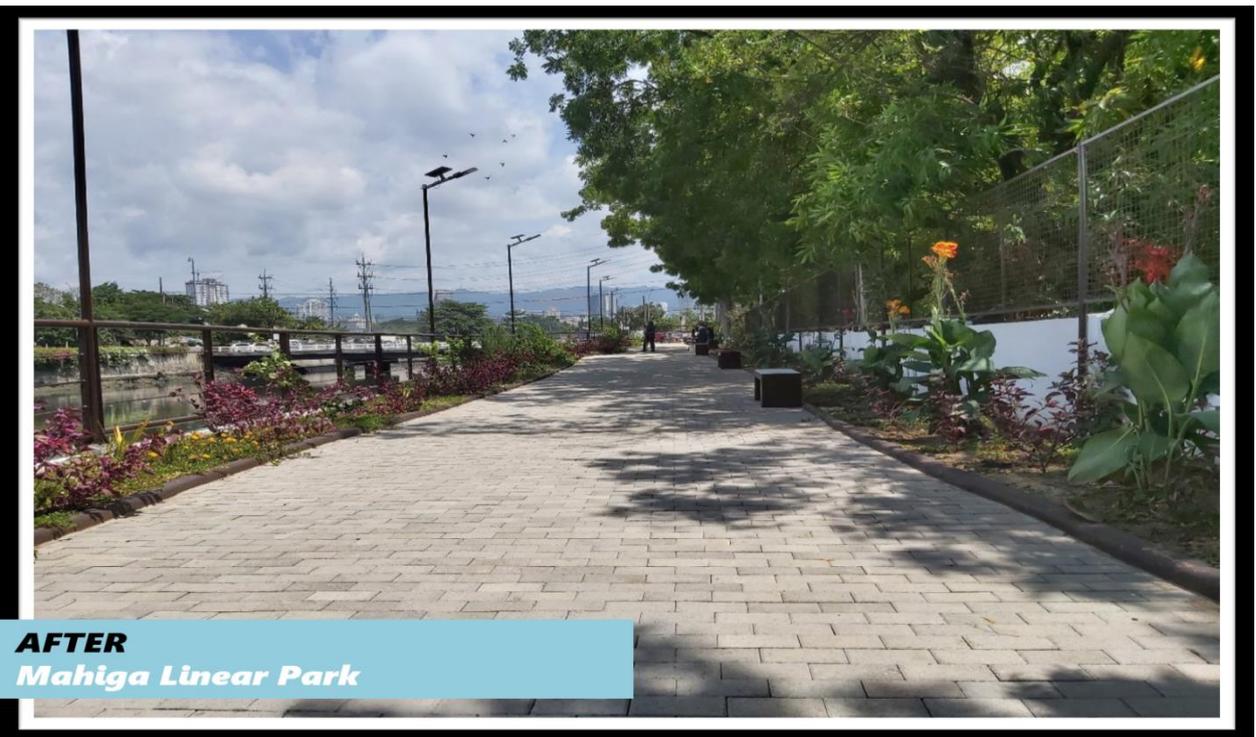
ECO-FENCE PROJECT

*40 panels installed /
100 meters in length*



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Another river, the Mahiga river, experienced a fresh make over from the recent completion of a linear park along its banks, formerly resided heavily by informal settler families.



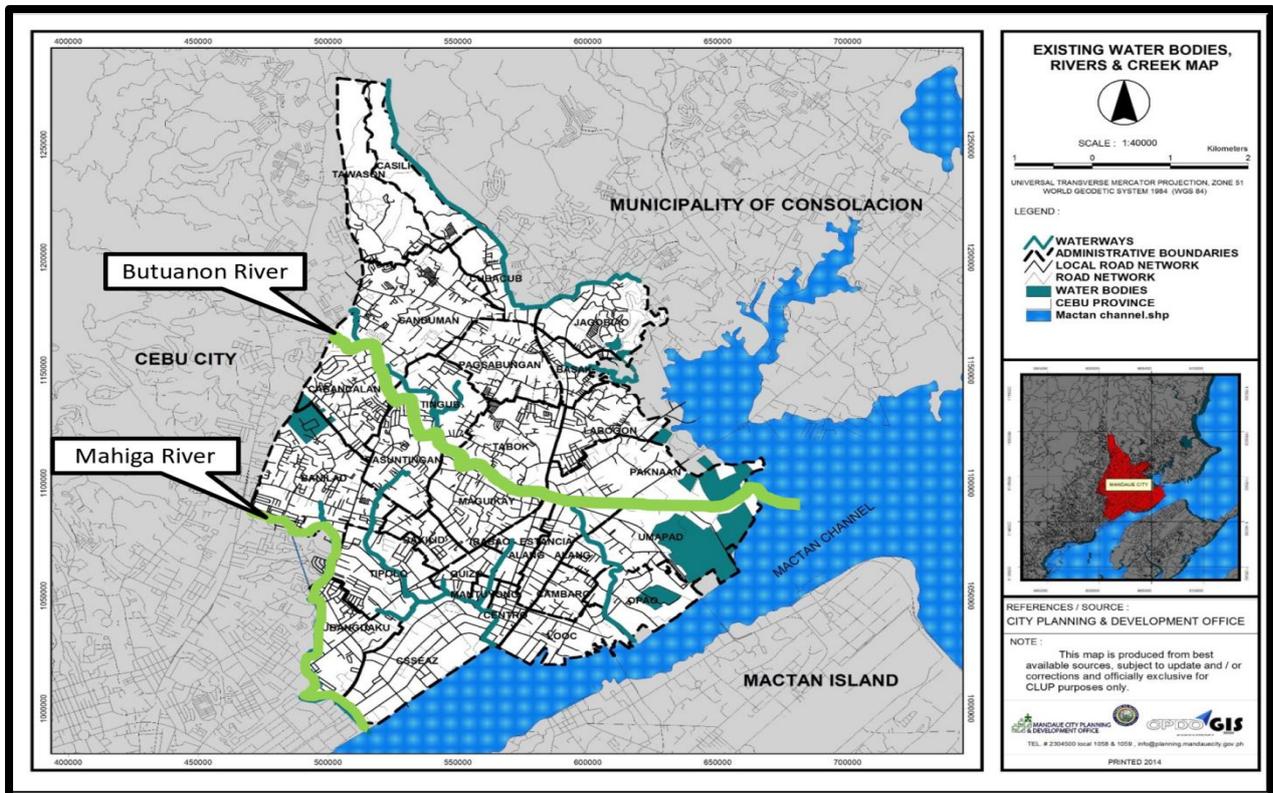
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Early win indicators also include among others:

1. The Creation of a new River Board for both rivers- **Ordinance No. 15-2021-1682**
 An Ordinance repealing City Ordinance No. 13-2014-889 (Creating the Butuanon River Watershed Management Board) to create the Butuanon- Mahiga Rivers Watershed Management Board (BMR-WMB)
 Many years back a river board was already created through a city ordinance but only for the Butuanon River. With this new board, the welfare of both rivers are properly represented.
2. Private Public Partnerships/MOA- partnerships with the Mandaue Chamber of Commerce Inc. (MCCI), Government Agencies and NGOs have produced collaborative projects.
3. River Policies- Numerous river protection and rehabilitation policies created by the City Council through the River Board chaired by the Local Chief Executive have paved the way to ensuring the road to river rehabilitation.

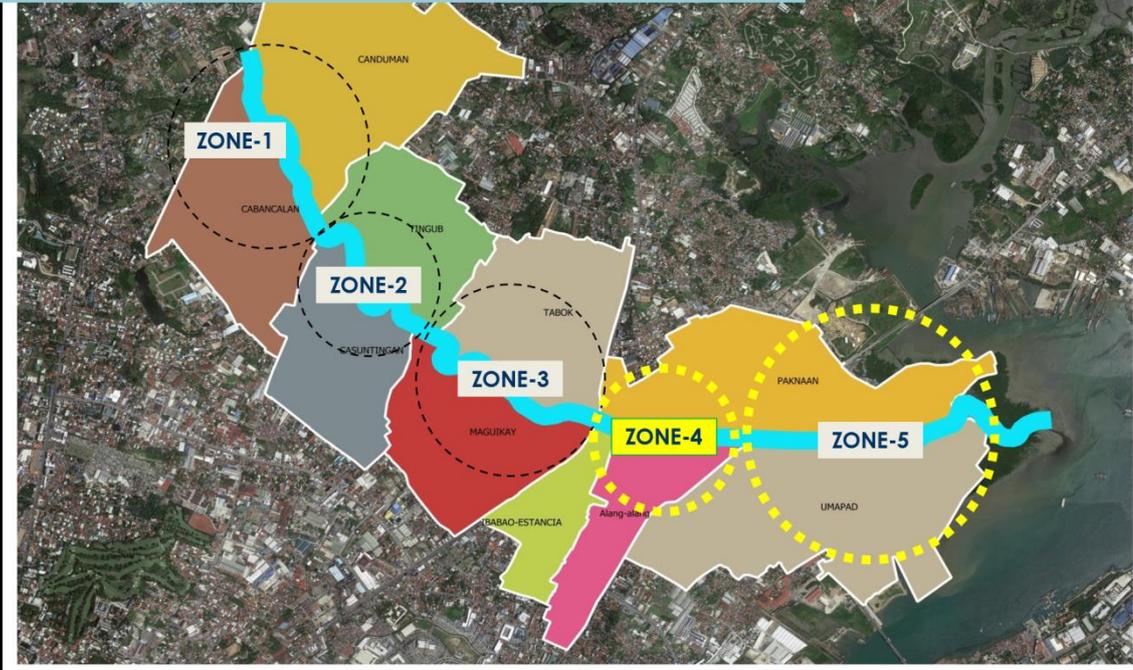
RIVER PROFILES:

River Master Plan file link: <https://bit.ly/3upWAq2>

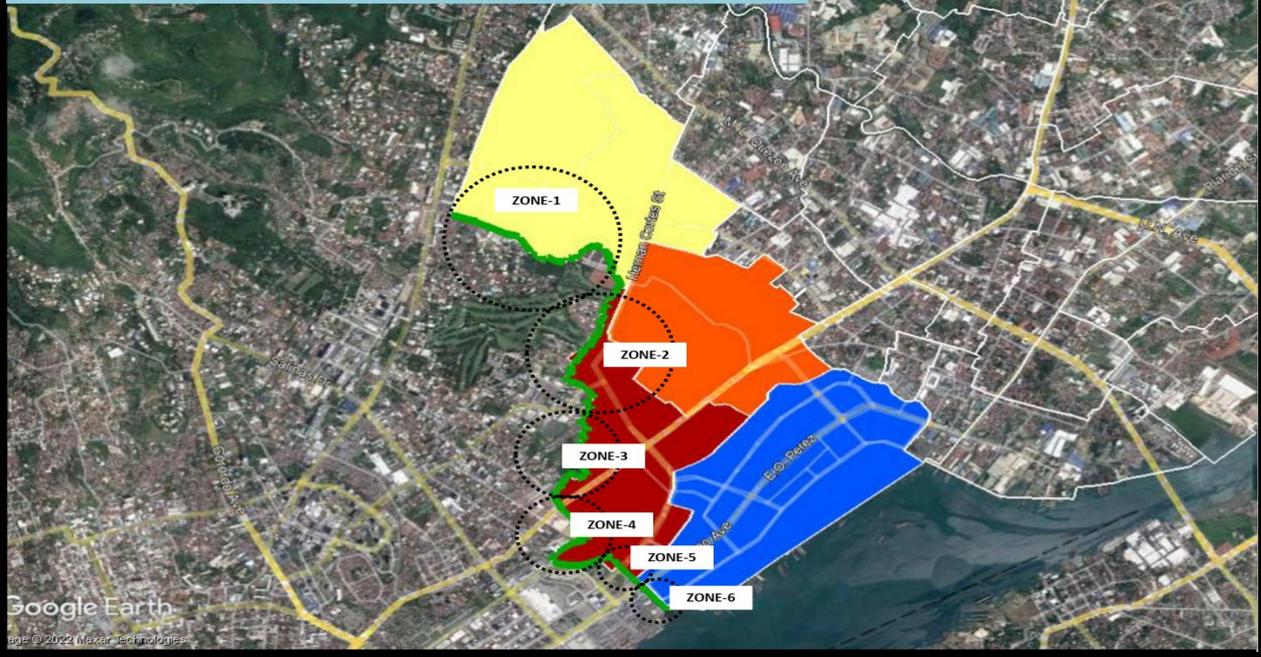


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Butuanon River

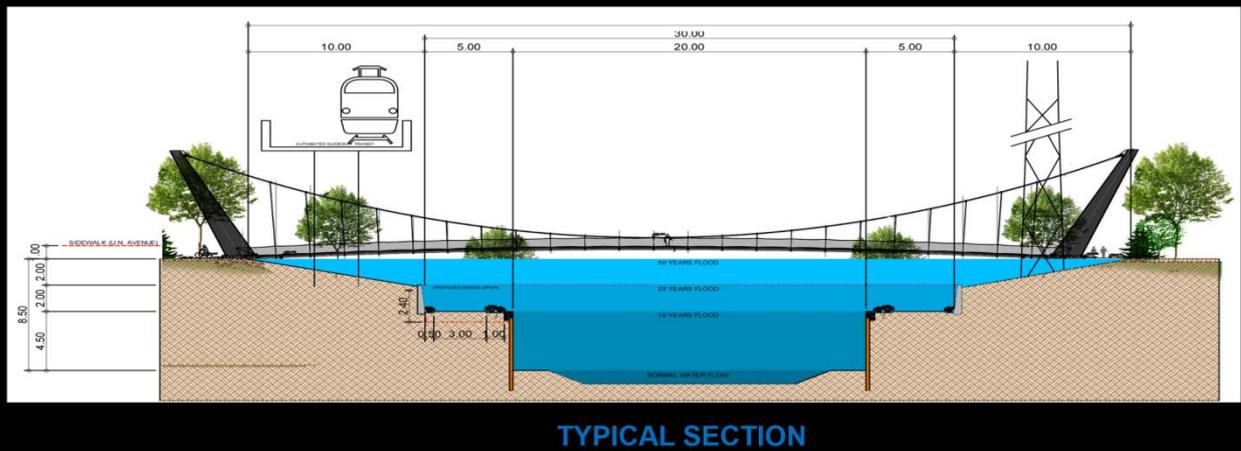


Mahiga River



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River Widening based on the Master Drainage Plan



In spite of all these concerted efforts, the health of our waterways and our rivers are still very much in a state of degradation. As stewards and beneficiaries of these water resources, it is our mission to ensure its health and sustainability. However, what we have done so far to respond to the importance of this natural resource is still not enough to revert it to its state of health decades ago. Each and every one is accountable to its rehabilitation as we are all part of its degradation. With this current reality for both rivers, this 5 year IRRP aims for an integrated approach as a foundation of this rehabilitation journey.

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More than 20 years of neglect cannot be undone in just a few years. Rehabilitation will take a lifetime.

However this 5 year IRRP is created to be the nudge to commence this journey of a lifetime, a journey that will change our relationship with our rivers.

B. GENERAL OBJECTIVE

By end of 2027, initiatives shall be established to facilitate the rehabilitation of the Butuanon and Mahiga Rivers through the 5 river rehabilitation areas. The idea is to establish evidence-based, relevant and integrate initiatives in all 5 areas within 5 years to influence the beginning of an integrated river rehabilitation management.

Basically, the 5 Year IRRP for both Butuanon and Mahiga Rivers has five rehabilitation areas of concern, namely:

- Focus Area 1. Social Preparation
- Focus Area 2. Physical Planning,
- Focus Area 3. Informal Settlement,
- Focus Area 4. Slope Protection and Flood Control and
- Focus Area 5. Water Quality

It is important to understand these 5 Areas. All Areas show cases, causes and consequences. It is as worthy to note that all 5 areas generally have City initiatives in place either in a policy form or in progress. However an overview of how integrated all these are to the health of our waterways is lacking. This 5 Year IRRP intends to show that integration.

C. 5 REHABILITATION FOCUS AREAS:

FOCUS AREA 1- SOCIAL PREPARATION

Description:

Social Preparation is the ground work of sustainable engagements. Increasing the level of awareness of the river community especially those living along the danger zones is key to their engagement and eventual ownership of what is truly at stake.

Area 1 focuses on identifying the program stakeholders, program / projects social marketing, and defining the roles of each stakeholder for the development of both rivers.

The same will help all program stakeholders understand better ones responsibility to the health of the river's ecosystem.

Part of the process would be the analysis on the current situation of both rivers, how these two rivers are affected with the modernization and continuous rapid industrialization and unregulated development.

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After analyzing, understanding the current situation of the rivers, and dissecting all factors that have caused river degradation, the stakeholders may come up with alternative courses of actions to respond / address river degradation.

The process will encourage / invite massive communities / stakeholders towards program participation and involvement. Eventually, this process would lead into the formation, creation, strengthening and establishment of a vibrant Community Project Manager or Purok Leader that would facilitate river rehabilitation initiatives.

Specific Objectives:

1. To conduct social marketing for this rehabilitation plan
2. To conduct community awareness activities with the concerned communities / stakeholders
3. To organize the Community through the Purok System
4. To facilitate the establishment of a Community Program Manager or a Purok Leader for river rehabilitation
5. To facilitate the enactment of necessary social and environmental policies

FOCUS AREA 2 - PHYSICAL PLANNING

Description:

Physical Planning is about optimal coordination of socio-economic activities to promote enhancement of the quality of life. Setting of actions aimed at improving the physical, social and economic welfare of both rivers and its dwellers must be clearly designed.

To ensure that the necessary improvements for these three aspects of development for both rivers and dwellers are considered, a participatory spatial planning must come into play.

Community involvement in the making of such plans creates a unique opportunity to make the river rehabilitation a people's mandate.

Specific Objectives:

1. To facilitate the conduct of a participatory spatial planning with the qualified stakeholders including the adjacent LGU and regional and national agencies.
2. To facilitate the institutionalization of the output of the physical planning conducted among the stakeholders
3. To monitor and evaluate implementation of the said plans

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FOCUS AREA 3 - INFORMAL SETTLEMENT

Description:

Housing poverty affects one's health and wellbeing.

Currently portions of the riverbanks are considered home to approximately 2,284 households (Local Shelter Plan). These riverbanks are also marked as danger zones of the City. These informal settlements along the riverbanks face real risks to their own lives daily. The presence of these settlements also impacts the health of the river ecosystem.

To mitigate this form of poverty which affects health of both man and river, Area 3 aims to understand the profiles of these settlements and find ways to connect them with sustainable solutions to resilient and decent housing programs.

As part of its mandate, the Housing and Urban Development Office (HUDO) shall initiate the process of relocation and or the transfer of affected families, from their current habitat (riverbanks) towards a resilient and decent housing program as reflected in the Local Shelter Plan.

Specific Objective:

1. To generate an updated data base of informal settler families residing within the 3-meter easement along both Butuanon and Mahiga River
2. To facilitate the clearing of these river banks identified as danger zones of informal settlements.
3. To facilitate the establishment of a relocation program or a resilient housing program for these informal settler families in compliance with the Local Shelter Plan of the City

FOCUS AREA 4 - SLOPE PROTECTION AND FLOOD CONTROL

Description:

The basic idea of the linear parks designed for these green corridors are built on the foundation of sustainable slope protection and flood control.

Riverbank erosion is mostly triggered by a combination of intense rainfall, flooding and unregulated development. Cases of illegal mineral extraction along the banks are culprits too.

Introduction of relevant infrastructures / initiatives such as but not limited to riprapping of the riparian zone of both rivers and river dredging to prevent soil runoff / erosion as well as overflowing of water from both rivers, which may cause flooding in some parts of the City. These initiatives have the support of the National Government thru the DPWH in coordination with the CPDO and the City Engineer's Office.

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Growing of appropriate trees / vegetation within the riparian zone of both rivers is also considered an integral part of sustainable slope protection and flood control. Pilot areas have been incorporated for this initiative in the linear park master plan.

Specific Objective:

To establish sustainable Slope Protection and Flood Control Program using both soft and hard infrastructure technologies responsive to the affected riverbanks, with considerations to the natural characteristics and features of the Butuanon and Mahiga Rivers.

FOCUS AREA 5 - WATER QUALITY

Description:

Clean water contributes to a healthy ecosystem. However, both rivers are considered highly contaminated water bodies. This is a result of years of unregulated development, informal settlements and rampant disposal of solid and untreated liquid waste from all dischargers into these rivers.

Polluting these rivers can be attributed to the practices of human beings who lack understanding of the effect to the environment. But basically it can also be attributed to lack of information, education and communication to what is needed to have healthy waterways.

Specific Objectives:

1. To generate an updated data base of wastewater dischargers along both the Butuanon River and Mahiga River;
2. To facilitate the conduct of regular monitoring of water quality using both accessible chemical and biological assessment tools.
3. To regulate wastewater disposal / discharges / spillage by establishments whose outfall is either Butuanon and or Mahiga River, according to the prescribed rules / standards
4. To regulate wastewater disposal / discharges / spillage by the domestic /residential community whose outfall is either Butuanon and or Mahiga River, according to the prescribed rules / standards
5. To facilitate the enactment and enforcement of environmental policies on water quality monitoring and water quality regulations and standards.

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D. IMPLEMENTATION INTEGRATION MATRIX

Table D.1

5 REHABILITATION FOCUS AREAS	Year 1	Year 2	Year 3	Year 4	Year 5
Focus Area 1- Social Preparation	*	*	*	*	*
Focus Area 2 - Physical Planning		*		*	
Focus Area 3- Informal Settlement		*		*	
Focus Area 4 -Slope Protection and Flood Control	*	*	*		
Focus Area 5 -Water Quality				*	*

Note: * indicates presence of projects/activities per year. Presence or location of * may change/vary after every annual review of the IRRP

Focus Area 1 Social Preparation takes first place for all five years. To sustain any endeavor one starts with ensuring ownership is identified and claimed. This takes time. But when the community is organized, the community is one in aspirations and vision.

Focus Area 2 Physical Planning becomes the valuable development tool anchored on these shared aspirations and priorities. This goes hand in hand with Area 1.

Focus Area 3 Informal settlements will never have a chance of rising from housing poverty if the Physical Planning is not in place and institutionalized. Area 3 is dependent on the output of Area 1 and 2.

Focus Area 4 Slope Protection and Flood Control however follows a different route based on city/ regional/national level planning and budget schedules. However if Area 4 integrates with Area 1,2 and 3 through the required coordination, the journey to rehabilitation will be smoother.

Focus Area 5 Water Quality is the final gauge, the lag measure in the rehabilitation of river. If the water quality monitoring data shows consistent passing of standards, resulting from the outputs of all other Areas, we have finally started the journey to making our rivers healthy again.

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E. INTEGRATION MATRIX FOR EXAMPLES OF EXISTING LOCAL PLANS/PROGRAMS/PROJECTS

Table E.1

EARLY WINS: EXISTING LOCAL PLANS/ PROGRAMS/PROJECTS	Focus Area 1 Social Preparation	Focus Area 2 Physical Planning	Focus Area 3 Informal Settlement	Focus Area 4 Slope Protection and Flood Control	Focus Area 5 Water Quality
CLUP	*	*	*	*	*
CCAF	*	*	*	*	*
LCCAP	*	*	*	*	*
DRRMP	*	*	*	*	*
MANGROVE PROTECTION PROGRAM	*	*	*	*	*
DPWH IMPROVEMENT AND MAINTENANCE PROJECTS	*	*	*	*	*
COMPREHENSIVE DRAINAGE MASTERPLAN	*	*	*	*	*
LOCAL SHELTER PLAN	*	*	*	*	*
PGS	*	*	*	*	*
ESWMP	*	*	*	*	*
FOOD SECURITY PROGRAM	*	*	*	*	*
PUROK SYSTEM	*	*	*	*	*
GREEN BUILDING PROGRAM	*	*	*	*	*

Note: * indicates presence of integration of Focus Area with existing local plans/programs/projects of the City. Identified local plans/programs/projects, presence or location of * and the entire integration matrix may change/vary after every annual review of the IRRP

CLUP- Comprehensive Land Use Plan
 CCAF-Climate Change Adaptation Framework
 LCCAP-Local Climate Change Action Plan
 DRRMP- Disaster Risk Reduction Management Plan
 DPWH- Department of Public Works and Highways
 PGS-Performance Governance System
 ESWMP- Ecological Solid Waste Management Plan
 LSP- Local Shelter Plan

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F. BUDGET

Table F.1 - Cost Summary for Plans/Projects for both Butuanon and Mahiga Rivers

5 REHABILITATION FOCUS AREAS	Butuanon River	Mahiga River	Cost
Focus Area 1-Social Preparation	5M	5M	10M
Focus Area 2-Physical Planning	100M	50M	150M
Focus Area 3 Informal Settlement	25M	15M	40M
Focus Area 4-Slope Protection and Flood Control	750M	250M	1B
Focus Area 5-Water Quality	-	-	-

Note: The 5 year IRRP does not include proposals for budget allocations/appropriations. It only presents current and approved budget for the rivers as baseline data.

Table F.2 - Cost Summary for completed projects for Butuanon and Mahiga Rivers

5 REHABILITATION FOCUS AREAS	Butuanon River	Mahiga River	Cost
Focus Area 1-Social Preparation	-	-	-
Focus Area 2-Physical Planning	6M	7M	13M
Focus Area 3 Informal Settlement	12.5M	11.8M	24.3M
Focus Area 4-Slope Protection and Flood Control	301.5M	76.9M	378.4M
Focus Area 5-Water Quality	-	-	-

Note: The 5 year IRRP does not include proposals for budget allocations/appropriations. It only presents current and approved budget for the rivers as baseline data.

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G. TASK OWNERS PER FOCUS AREA

Table G.1

5 REHABILITATION FOCUS AREAS	Lead Task Owner	Support Task Owners
Focus Area 1-Social Preparation	OSM	HUDO, MCENRO, LIGA
Focus Area 2-Physical Planning	CPDO	OSM, LIGA
Focus Area 3 Informal Settlement	HUDO	CPDO, OSM, LIGA
Focus Area 4-Slope Protection and Flood Control	CEO	CPDO, DPWH, LIGA
Focus Area 5-Water Quality	MCENRO	EMB 7, Academe, NGOs, LIGA

Note: Lead Task Owners are to be retained within the 5 year period to ensure focus. Support Task Owners however may change/vary after every annual review of the plan.

- OSM - Office of Strategy Management
- CPDO - City Planning and Development Office
- HUDO - Housing and Urban Development Office
- CEO - City Engineer’s Office
- MCENRO - Mandaue City Environment and Office
- LIGA – LIGA Ng Mga Barangay
- NGOs - National Government Office
- DPWH - Department of Public Works and Highways

The Butuanon- Mahiga Rivers Watershed Management Board (BMR-WMB) shall oversee, monitor and evaluate achievement of objectives of the 5 rehabilitation areas. The same board shall also conduct an annual assessment or review of the 5 year IRRP.

FOCUS AREA 1 SOCIAL PREPARATION PRE-WORK (YEAR 0)

The City VAP on River Rehabilitation for Butuanon and Mahiga Rivers which is led by MCENRO directly aligns to the 5 Year IRRMP for Butuanon and Mahiga Rivers. Social preparation was founded on changing your relationship with the river. Social preparation activities for the communities/ stakeholders for each rivers have been initiated through the use of two performance tools; the Eco Fence of the Butuanon River and the Trip Trap for the Mahiga River.

The Implementation Plan for each River Community with their respective performance tool comprise of the following elements;

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1. Community Profiling Tool Design
2. Inventory of Establishments along the river banks
3. Community Profile Consolidation
4. Social Marketing
5. Commitment Building
6. Community Initiatives

Expected targets and outputs of the City VAP led by MCENRO have been designed to kick start Focus Area 1 -Social preparation.