

KAWING

A PROPOSED URBAN RIVER
REHABILITATION DEVELOPMENT
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AERIAL PERSPECTIVE

DESIGN STRATEGIES

DESIGN CONCEPT: Connections

The design concept of connections will guide both the physical and more abstract elements of the design. In the physical sense this can be divided into two kinds of connections. The first being ecological connections between the chosen limits of the site. This is in line with the Blue-Green Network strategy that is the theoretical basis for the proposal. Next is the physical user connections that can physically connect the communities on the edges of the site with each other and with the designed areas around the river.

DESIGN PHILOSOPHY: Rehabilitation

The main goal of the proposed design is the rehabilitation of the Tullahan river, and this is based on several theories that provide a consistent methodology for the design approach. The theories it is based on are the following:

DESIGN THEORIES

Blue-Green Network Strategy:

The strategy is an urban space development concept that defines a network of existing or restored rivers and river valleys (blue) and agricultural areas, parks, and vegetated areas (green) as the basis for spatial programming in urban developments. The goal of this is to provide a method of conceptualizing sustainable development and climate change adaptation to developments and renewal of urban spaces.



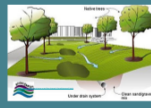
River Rehabilitation:

The design interventions will follow the concept of River Rehabilitation as opposed to full River Restoration. This is because in the context of urban developments it is often impossible to pursue complete river restoration objectives. River rehabilitation is a concept applied due to the inherent limitations of urban areas. In this model the objective is to focus on the main functions to bring the river to an approximation of its natural state rather than complete renaturalization.



Low Impact Development:

Low Impact Development (LID) in the context of urban development and stormwater management refers to systems and practices that use or mimic natural processes that result in the infiltration, evapotranspiration or use of stormwater in order to protect water quality and associated aquatic habitat. Acting in essence like a sponge. This allows for the extraction of water from the ground through urban or peri-urban wells. This water can be easily treated and used for the city water supply.

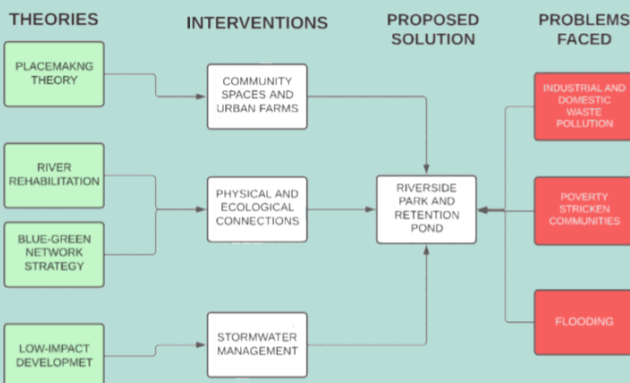


Placemaking Theory:

Placemaking is a people-centered approach to the planning, design and management of public spaces. It is a theory that seeks to look past the material dimension of spaces and conceptualize them through the lens of sociability, uses, activities, access, connections, comfort, and image, to create bonds between people and a sense of place. Placemaking means creating places and focuses on transforming public spaces to strengthen the connections between people and these places.



THEORETICAL FRAMEWORK



SITE INVENTORY

SITE DESCRIPTION

The selected site covers approximately 135,000 square meters or 13.5 hectares and is located on the banks of the Tullahan river in between Barangay Catmon and Barangay Maysilo. Barangay Catmon has a population of 44,868. This represented 11.79% of the total population of the city of Malabon which is 380,522 people. Barangay Maysilo has a population of 10,445. This represents 2.74% of the total population of the city of Malabon which is 380,522 people.

PHILIPPINE KEYMAP



METRO MANILA KEYMAP



CATMON POPULATION

Census Date	Household population	Number of households	Average household size
1990 May 1	33,231	2,341	4.80
1995 Sep 1	37,889	3,790	4.72
2000 May 1	25,386	4,814	4.44
2007 Aug 1	36,804	5,286	4.50
2010 May 1	38,400	6,352	4.56
2015 Aug 1	38,470	8,830	4.36

MAYSILO POPULATION

Census Date	Household population	Number of households	Average household size
1990 May 1	9,970	2,071	4.81
1995 Sep 1	9,540	1,987	4.80
2000 May 1	8,210	2,001	4.61
2007 Aug 1	11,091	2,383	4.65
2010 May 1	11,202	2,635	4.25
2015 Aug 1	13,382	3,088	4.37

MAIN PROBLEM

How can the ecological condition of the Tullahan river be improved along with the threat of flooding with the current conditions of the study area? Along with this are some related problems such as:

SUB PROBLEMS

- How can the quality of stormwater runoff that goes into the Tullahan river will the surrounding areas be improved?
- How can flood risk and the damage potential of floods in the area surrounding the Tullahan river in the study area be reduced?
- How can the surrounding communities be integrated into the process of river rehabilitation and build a sense of proprietorship among them for the river system?

PESTLE ANALYSIS



POLITICAL Analysis

- The study area covers two barangays, Maysilo and Catmon, which covers an area of 126.53 hectares and 9777 hectares respectively, and 224.3 hectares in total.
- Barangay Catmon has a population of 44,868, and Barangay Maysilo has a population of 10,445.



TECHNOLOGICAL Analysis

- City ordinance prohibits the burning of solid waste on streets, sidewalks, public, and private places within the city.
- The largest industrial facility within close proximity to the study area is the LKK Cold Storage facility warehouse which borders an unused fishpond on its eastern edge.



ECONOMIC Analysis

- The industries within Malabon city include sugar refining, pats making, cigar-making, candle production, fishing and flower-extract production.
- The Department of Social Welfare and Development considered about a quarter of the households within Malabon city to be poor, with a significant portion of the labor force was engaged in vulnerable, low-income employment.



LEGAL Analysis

- City ordinance prohibits the burning of solid waste on streets, sidewalks, public, and private places within the city.
- Environment Secretary Roy Cimatu performed an inspection of the length of the Tullahan river and they reported that around 15,000 residents directly throw liquid and solid wastes to the water.



SOCIAL Analysis

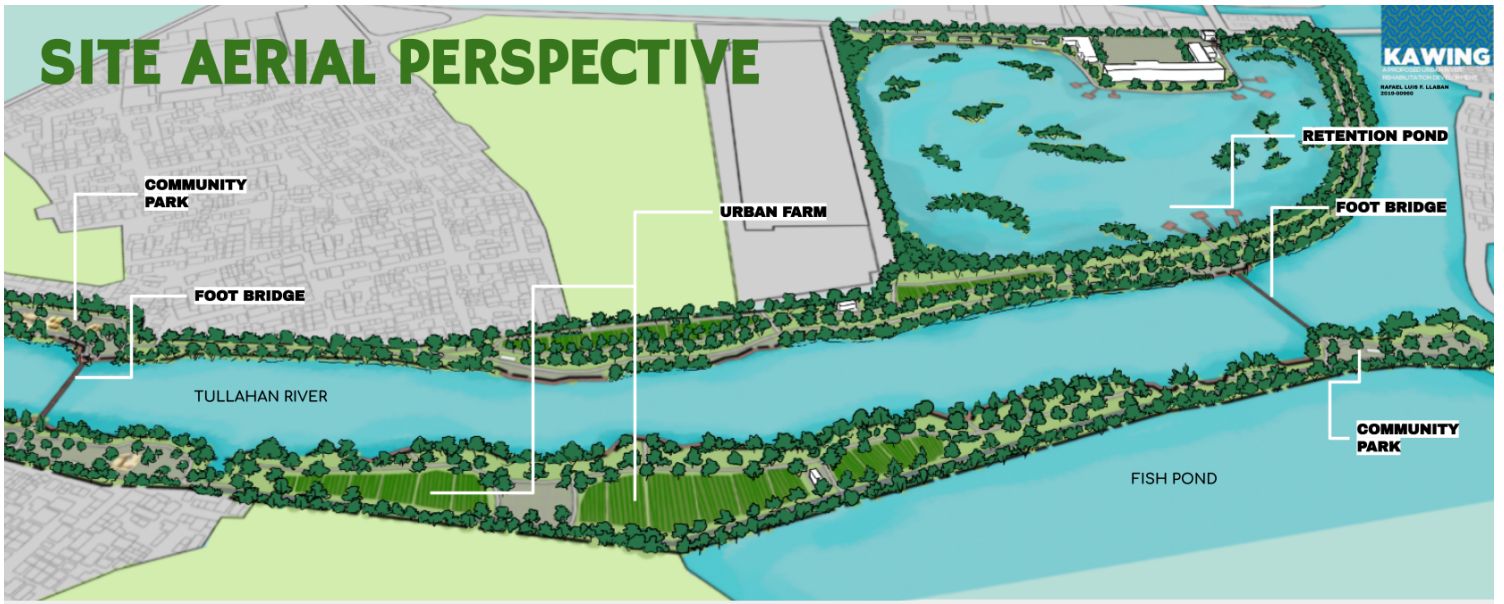
- City ordinance prohibits the burning of solid waste on streets, sidewalks, public, and private places within the city.
- There are two large clusters of informal settlements within the study area, one on the north side of Barangay Catmon, and one on the southern side of Barangay Maysilo.
- Chronic child malnutrition is also highly prevalent in Malabon City.



ENVIRONMENTAL Analysis

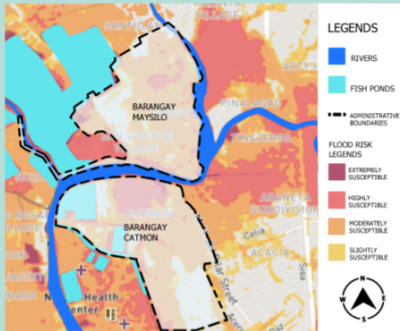
- According to the Malabon City Development Plan of 2014-2016, all 21 barangays are susceptible to flood, with Barangay Catmon and Maysilo being highly susceptible.
- The average coliform level in Tullahan is 500 million most probable number (MPN), with a high level of fecal bacteria present in the river.

SITE AERIAL PERSPECTIVE



SITE ANALYSIS

FLOOD RISK MAP



The area around the study area of Barangay Maysilo and Barangay Catmon are particularly vulnerable to flooding, in already flood prone Malabon city because of its proximity to the Tullahan and other intersecting rivers and bodies of water such as the surrounding fish ponds.

Urban rivers are part of cities' drainage system, it is therefore essential in the mitigation of flooding especially during typhoons and the rainy season..

SITE ANALYSIS



The area around the proposed site is home to large amounts of residential homes, many of which are informal settlements located near the banks of the river. There are also large industrial facilities nearby, most prominent of these being the LKK Cold Storage facility. Nearby institutional uses can also be found with the Malabon city hall of justice on the southern edge of the site, and the Malabon city Jail and people's park being located in Barangay Catmon. Also present are large fish ponds on both sides of the river

STRENGTHS

1. Meandering curves of the river and the edges of the channel create an interesting shape for the design.
2. Large amounts of unused space at the river banks in the study area are available.

WEAKNESSES

1. Green spaces are scattered throughout the length of the study area,
2. Close proximity of various industrial facilities to the river edge.
3. Riverside areas are ignored in terms of development and improvements

OPPORTUNITIES

1. Close proximity of residential communities that will be the main users of the amenities in the site.
2. Fish ponds present in the western portions of the site at the intersection of the Muzon river can be integrated into the design.
3. Unused fish pond surrounding the Malabon hall of justice can be used as a catchment basin for overflow from the river

THREATS

1. Domestic and industrial waste further upstream can still affect the water quality in the study area as the waste flows down the river.
2. Presence of many water bodies increase flood risk

SITE PICTURES



SPOT PERSPECTIVES



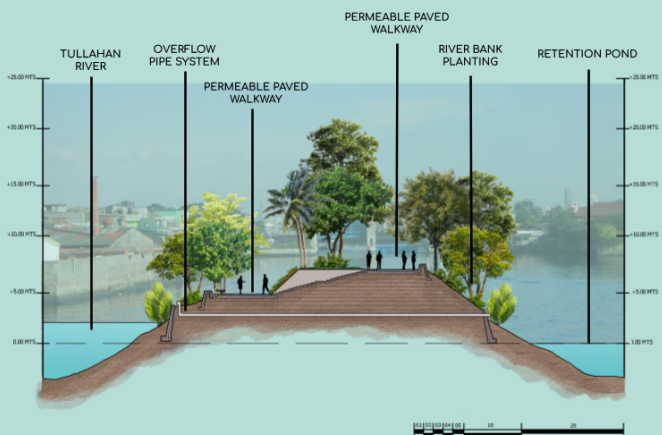
SITE DEVELOPMENT PLAN



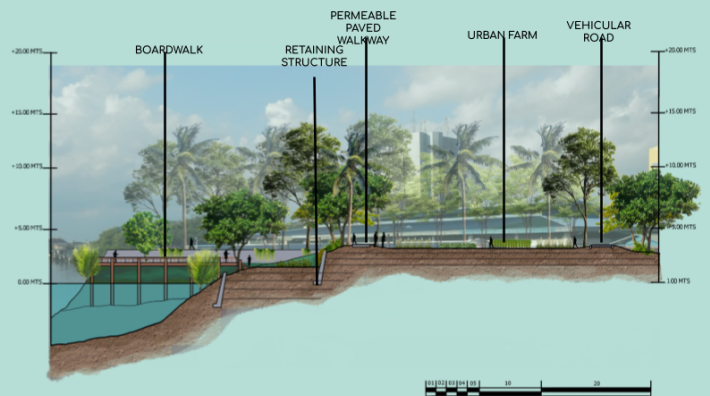
SECTION-ELEVATIONS



SE-01 SECTION-ELEVATION 1
SCALE 1 : 280 MTS



SE-02 SECTION-ELEVATION 2
SCALE 1 : 250 MTS



SDP-03 SECTION-ELEVATION 3
SCALE 1 : 250 MTS