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UNIVERSITY OF THE PHILIPPINES DILIMAN
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bahay + latian

LOW-COST HOUSING COMPLEX FOR FARMERS
AND DISPLACED FAMILIES IN BULAKAN, BULACAN



DESIGN CONCEPT OVERVIEW

SITE ANALYSIS

PROBLEM STATEMENT

"Levels of water dams that irrigate farmers of Bulacan has been plummeting to critical levels annually on dry seasons leaving farmers in unstable agricultural production, all the while draining grey water that could beaterally, if treated, even be sold. How can a housing facility in Bulacan integrate irrigation technological innovation in agricultural production?"

PROJECT GOALS

The development will look that takes care of community services to tenants.

Improve the current government housing infrastructure in terms of design and effectiveness.

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Improve agricultural productivity by utilizing irrigation health watershed.

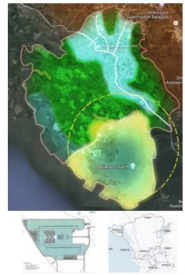
Provide livelihood opportunities to residents.

EXECUTION

The development has two major components for it to work as guaranteed: (1) grey water collection and stormwater harvesting and treatment; and (2) housing structure exclusive for farmers and displaced families. Grey water and stormwater will be collected from households through separate pipe branch and will be directed to an onsite constructed wetland where it will begin its treatment process. From there, it will go through different stages of water treatment, and once finished, will be stored in a pond located at the park that is linked to a nearby river channel (to reduce overflow and stagnant water) and crop plots which it irrigates. Housing structures must not only provide residential units but as well as spaces for recreation, socialization and livelihood opportunities for its occupants.

NATURE OF USERS

Average number of members per family unit is 4.18, but for uniformity, the number of members per residential unit is 5. Filipino families are social people, so places for recreation and interaction among residents is a must. Farmers need spaces for crop preparation and storage and should be easily accessed from farmlands and service roads to ease diasporetic activities and farm-to-market transportation. Main mode of transportation for the target demographic and among private vehicle users is motorcycle. Allocation of space for motorcycle parking (among other vehicles: cars, bicycle, and service vehicles) at discreet but accessible location is needed.



PROXIMITY TO URBAN CORE

Urban zone (ayan) is located at the northern part of the municipality, and towers southwards along main roads. Lands primarily used for agriculture (green) envelope the urban nodes, and transition to lands for farmerfolk (blue) at the outskirts. Dewatered zones are at the Northeast border of Bulacan (orange). Irrigation assistance at areas near these zones must be in order.

The chosen site is located at the south of the eastern end of Begumbayan Street, the municipality's main road. Following barangay roads, the site is roughly 1.5 kilometers away from the main road, and 3.0 kilometers away from Pambayang Bayan ng Bulacan, the municipality's public market. The lot is at the approximate center of Bulacan's urban district to its north, and the New Manila International Airport at its south. Being in the center of two primary urban cores, it can aid in decongesting settlements expected from these areas.

IMPENDING DEVELOPMENTS

Through the recent development of transportation by land and by air, Bulacan will inevitably be the link between the two metropolises: NCR and New Clark City. It can be expected that areas surrounding these transportation nodes will develop and adapt to the needs of its subsequent effects.

USERS AND STAKEHOLDERS

MAIN TARGET USERS

Farmers and displaced families are the main target users of the design project in Bulacan, Bulacan. Agriculture lands they own are the most vulnerable in peri-urban developments and the decrease in rice production of rice farming income forces farmers to sell their lands to private developers for the highest bidder; this results to rampant selling and diminishing of rice lands. These farmers are also prone to residential displacement due to the spread of commercial developments in urban nodes and contributes to the already rising housing project backlogs of the government.

SECONDARY USERS

The secondary users of the design development are farmers' market stall vendors, shoppers, administrative personnel, service staff, maintenance staff and security staff. These people may also belong to the family units in residence, and family members of the main target users that are not employed in the agricultural activities of the development.

ARCHITECTURAL DESIGN

SITE DEVELOPMENT PLAN



DESIGN RATIONALE

Bahay or Latian is a combination of two solutions: housing and constructed wetland grey water filtration system. These two aim to provide sustainable design solution to three issues: needed improvement on low-cost housing facilities, reusable grey water wastage, and decline in crop production due to worsening dry spells.

The 2.56 hectare development is designed as a better housing alternative for farmers who lost their land to developers, and displaced families from land ownership disagreements. The housing complex provides spacious homes for an array of family settings: 252 2-bedroom 2-bathroom units designed to accommodate family units with five members, and 16 1-bedroom 1-bathroom units for family units with under 3 members. In addition, the housing complex provides open recreation grounds/courtyards for physical and social activities, multipurpose stage to hold events that faces a full-sized basketball court, crop preparation and storage space and livelihood opportunities such as commercial units for lease, and a farmer's market.

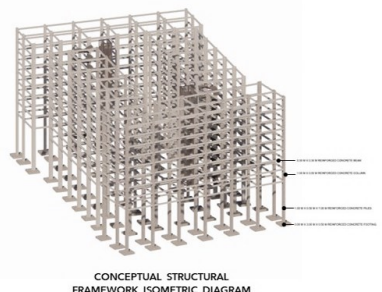
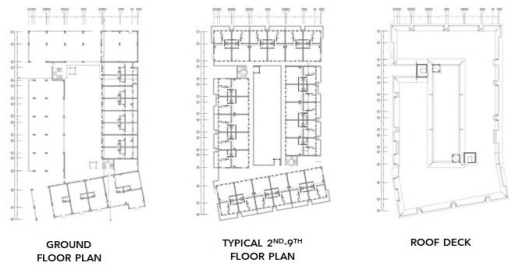
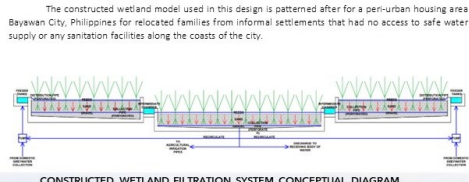
Grey water is collected from kitchen sinks and rainwater harvesting system of housing units through a separate pipe system which is then pumped to the onsite constructed wetland grey water filtration system disguised as a botanical water feature. The filtered water will be either be used as irrigation supply to the agricultural plot adjacent to the complex, discharged to a receiving body of water, or for another cycle of filtration.

The architecture of the designed ecosystem of reusing resources, the harmonious sense of community through shared social spaces, and accessible livelihood opportunities will enable these disadvantaged families to uplift themselves from poverty and live dignified lives and be productive members of the society. The design solution that is the blueprint for low-cost housing facilities in the country for communities that share similar circumstances. **Bahay or Latian** believes in the philosophy that metropolitan development must go hand in hand with sustainable design solutions and no one should be left behind along the way.

GREY WATER, STORMWATER & CONSTRUCTED WETLAND

Greywater contains nitrate and phosphate, which are plant nutrients. Discharging these nutrients into the soil or shallow aquifers or wetlands acts as fertilizer and improves plant growth. However, if discharged directly into surface water (ponds, river, or streams) constitutes as pollution. The excess amount of nutrients causes algae blooms and when these algae dies that results to microbial decomposition and deoxygenation of the body of water.

The constructed wetland model used in this design is patterned after for a peri-urban housing area Bayawan City, Philippines for relocated families from informal settlements that had no access to safe water supply or any sanitation facilities along the coasts of the city.



LINK TO VIDEO