



MARIANO MARCOS STATE UNIVERSITY

WATER RECYCLING PROGRAM



Fishponds at MMSU Currimao Campus – College of Aquatic Sciences and Applied Technology. These fishponds used for aquaculture impounding runoff (overflows) from rain and estuary.



Small farm reservoirs (SFRs) and cascading pond system within the MMSU Batac Campus harvest rainwater and serve as artificial groundwater recharging mechanism.



MMSU started a research that aims to identify suitable macrophytes that can be utilized in the development of a wetland treatment system on-campus. This is in preparation for the plan of the university to create canal and pond treatment systems that would collect the wastewater from the auxiliary kitchens of the university. The treated water can then be used to irrigate the adjacent agricultural lands for the production of crops.

Additionally, similar concept was also conceptualized for the treatment of piggery effluents in the livestock farm in the university. The treatment ponds and canal system will be integrated with different species of macrophytes for treatment and afterwards will be released into the adjacent agricultural lands.

Description:

1. The MMSU generally utilizes groundwater for its daily operations. It develops and maintains its own water supply, i.e., groundwater extraction. For its laboratory activities which require a certain water quality, the University uses market available distillation equipment/method to treat groundwater conveyed through taps.
2. To balance supply and extraction (demand), the University contributes to the recharging of aquifers through small farm reservoirs (SFRs) and cascading pond systems. While the University has yet to establish an infrastructure-enabled water recycling program that primarily reclaims wastewater, its current system of collecting surface runoff to be used for beneficial purposes, such as irrigation, aquaculture, and groundwater recharge, serve the same objectives, meantime. This conforms to the national policy to utilize surface runoff to mitigate the adverse effects of groundwater extraction, especially in groundwater critical areas, as articulated in the Philippine Water Supply and Sanitation Master Plan (PWSSMP).

With these green infrastructure, **MMSU is able to recycle/reuse a total volume of 86,114.25 cubic meters, or 90% of the total volume of water impounded**, for irrigation, aquaculture and other purposes.

Location	Identifier	Area (sq.m)	Depth (m)	Volume of water stored (cu.m)
MMSU Batac Campus	SFR1	3,162.00	4.00	12,648.00
	SFR2	3,394.00	3.00	10,182.00
	SFR3	1,265.00	2.00	2,530.00
	SFR4	625.00	4.00	2,500.00
	SFR5	1,713.00	2.00	3,426.00
	SFR6	1,567.00	2.00	3,134.00
	SFR7	1,251.00	1.50	1,876.50
	SFR8	3,003.00	4.00	12,012.00
	SFR9	2,422.00	1.50	3,633.00
	SFR10	1,181.00	2.30	2,716.30
	SFR11	604.00	2.30	1,389.20
	SFR12	1,891.00	2.00	3,782.00
	SFR13	390.00	1.00	390.00
	SFR14	1,281.00	1.50	1,921.50
	SFR15	844.00	1.50	1,266.00
	SFR16	646.00	2.00	1,292.00

	SFR17	761.00	2.00	1,522.00
	SFR 18	7,063.00	1.00	7,063.00
	SFR19	1,258.00	1.50	1,887.00
	Pond1	672.00	3.00	2,016.00
	Pond2	3,200.00	3.50	11,200.00
	Pond3	1,713.00	3.00	5,139.00
	Pond4	307.00	3.00	921.00
	Pond5	412.00	3.00	1,236.00
Total Volume				95,682.50
Approximate/typical recharge rate based on soil type (clay loam) and observations				10%
Equivalent volume conserved – aquifer recharge				9,568.25
Percentage recycled/reused for irrigation and other purposes				90%
Equivalent volume recycled/reused				86,114.25

3. To complement the aforementioned, the University has adopted and has been implementing the MMSU Water Sustainability Road Map, which sets forth its:
- Strategies and conservation activities**, such as: i) prioritizing installation of low-flow fixtures in cases of plumbing repairs/replacement; ii) prioritizing WaterSense appliances, where applicable; iii) Eco-challenge among units to encourage/promote water conservation initiatives/interventions; iv) timely detection and reporting of leakages; and v) information and dissemination.
 - Policies**, particularly: i) at the college/unit level – using smart irrigation systems that reduce water use by 40 percent; using “leftover” water from bottled waters/drinking glasses; reporting leaking faucets and running toilets or urinals that are not operating ‘on demand’ through a maintenance request (by unit); half flush in the toilet; turning off taps between wetting, soaping (20 seconds) and rinsing hands; and ii) at the field level – watering plants in the early morning/late evening to decrease the amount of evaporation.
 - Research on water recycling and treatment** - the research and development unit of the university provides support and assistance in the conduct of researches related to water treatment and recycling as part of its advocacy to create innovations that would benefit the environment by providing innovative solutions to environmental problems.

EVIDENCES:

MMSU Water Sustainability Road Map

https://mmsu.edu.ph/resources/1izcnajQ-fevWTtutXdr7u4L6BHISX_M1/view?usp=sharing&fbclid=IwAR1zVaiYIdHA7oY33oC579f4tdSpBsbpbz4e9XoX6mMqOp5sGO4lrZrsR94.

Water Resources Sustainability/Conservation Plan

<https://www.mmsu.edu.ph/about/sustainability>
<https://www.mmsu.edu.ph/about/water-conservation-program>

Philippine Water Supply and Sanitation Master Plan (PWSSMP)

<https://neda.gov.ph/pwssmp/>
https://neda.gov.ph/wp-content/uploads/2021/09/021122_PWSSMP_Abridged-Version.pdf