

Waste Water Treatment by using Photoremediation Process

Gayatri Jadhav¹, Revati Donde², Arpita Khandale³, Purva Ghuge⁴, Harshita Pagar⁵,
Sagar Shinde⁶, Gaurav Ahire⁷, Prashant Chavan⁸

Students, Department of Civil Engineering^{1,2,3,4,5}

Professor, Department of Civil Engineering^{6,7}

HOD, Department of Civil Engineering⁸

Guru Gobind Singh Polytechnic, Nashik, India

Abstract: *This study presents the design and implementation of a constructed wetland for wastewater treatment. The wetland, measuring 160 cm in length, 60 cm in breadth, and 30 cm in height, was constructed with three layers. The bottom layer consisted of 8 cm of coarse aggregate, followed by a 4 cm thick middle layer of fine aggregate passing a 4.75 mm sieve.*

The top layer comprised 12-14 cm of black cotton soil. Prior to installation, both aggregates were cleaned using water. The wetland was planted with colocasia and canna indica plants.

Waste water from a collage hostel was slowly poured into the wetland, and the treated water was collected through a tap positioned 2 cm above the bottom layer. Several tests were conducted on the treated water, including pH, TDS, TSS. The results showed a treatment efficiency ranging from 70 to 80%.

These findings suggest that the designed constructed wetland, along with the chosen plant species, is effective in removing contaminants and improving the quality of the waste water. Further research is recommended to explore the long term performance and optimize the design parameters of the wetland.

Keywords: plants, pollutant removal, photoremediation, wastewater treatment

REFERENCES

- [1]. Petro Novert Karungamye : Potential of canna indica in construction wetland for waste water treatment, Actuators, 11th August 2022, volume 2.
- [2]. Yuhan_Ma : Biological response and photoremediation of perennial ryegrass to halogenated flame retardants and Cd in contaminated soils, journal of environment chemical engineering , december 2021 , volume 9,
- [3]. Anton Stepanenko : Duckweeds for photoremediation of polluted water , MDPI Currently publishes 421 peer-reviewed journals , and 9 conference , 29 january 2023, volume 12.
- [4]. Paliza Shrestha : Photoremediation of heavy metal-contaminated soil by switchgrass , A comparative study utilizing different composts and coir fiber on pollution remediation , plant productivity , and nutrients leaching, 9 April 2019 , volume 16
- [5]. Kuldeep Baudh : Phycoremediation : Use of Algae to sequester Heavy Metals, MDPI currently publishes 421 peer-reviewed journals , and 9 conferences, 1 july 2022, volume 1.
- [6]. Chenjiao Duan : Photoremediation of potentially toxic elements (PTSs) contaminated soils using alfalfa (Medicago sativa L.) : A comprehensive review, April 2022, volume 293.