”Assessment Of Wastewater Treatment System At Dhulikhel Hospital”

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INTRODUCTION

Globally, 360 km^3 per year of domestic and municipal wastewater is generated, with only 11.4% being treated and reused 41.4% treated and discharge while remaining 47.2 % is not treated and directly release to environment (Jones et al., 2021).

Hospitals in developed countries generate 400-1200 L of wastewater per bed per day, while in developing countries, it is 200-400 L per person per day (Kumari et al., 2020).

Developing countries face challenges in wastewater management due to insufficient infrastructure, technical and institutional capacity, and financing (United Nation World Water Assessment Programme, 2017).

Nepal's expanding urban areas and growing population have led to untreated sewage

RESEARCH QUESTION

- What is the removal efficiency of each treatment unit in the Dhulikhel hospital wastewater treatment plant?
- Is the wastewater treatment system at Dhulikhel hospital effective in treating and disposing the wastewater?

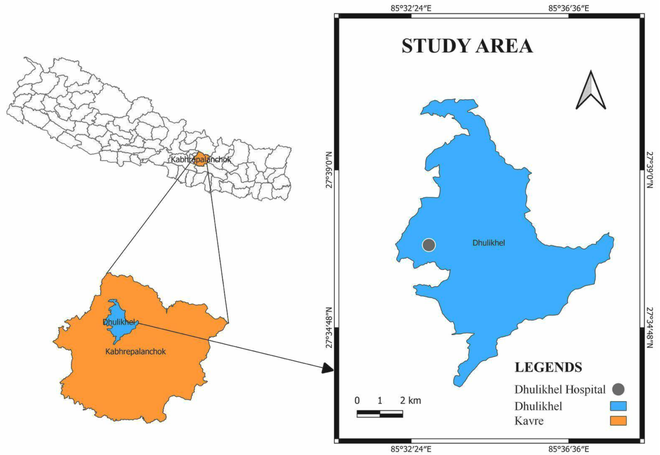


Figure 1: Location Map Of Study Area

OBJECTIVE

To compare the efficiency of the different treatment units and identify any areas for improvement.

SAMPLING METHOD

Total Number of Samples

Total number of samples per day = 5 sampling points x 2 sampling times per day = 10 samples

Total number of samples per week = 10 samples x 3 days/week = 30 samples

Total number of samples for the study (2 weeks) = 30 samples x 2 weeks = 60 samples

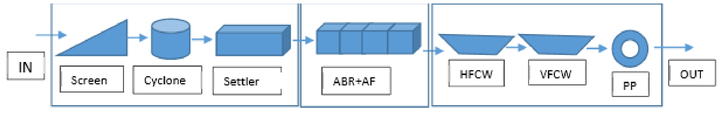
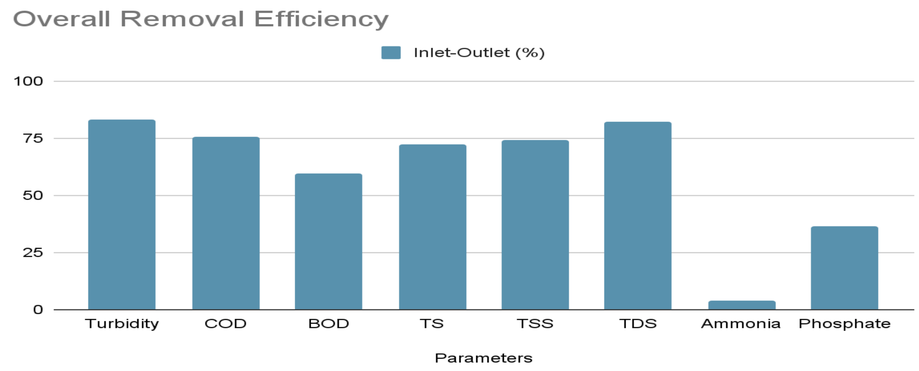


Figure 2 : Flow diagram of Dhulikhel Hospital Treatment Plant



Graph 1 : Overall Removal Efficiencies Of Different parameters

CONCLUSION

The removal efficiency of TSS and BOD, ammonia, and phosphate in the treatment plant is very low which indicate that the settler and Horizontal reed bed respectively is less effective for the treatment process.

The treated wastewater meets the hospital wastewater standards published for parameters like pH, temperature, COD, BOD, TDS, ammonia, and phosphate.

The Dhulikhel Hospital Wastewater Treatment Plant is partially effective in reducing some pollutants and parameters studied at an acceptable level, but some are not well removed such as TSS, BOD, ammonia, and phosphate.

REFERENCES

Annual Report Department of Health Services 2076/77 (2019/20) (p. 473). (2021). https://dohs.gov.np/annual-report-2076-77-2019-20/

Boukalová, Z., Tìšitel, J., & Das Gurung, B. (2020). *Nature-based water treatment solutions and their successful implementation in Kathmandu valley, Nepal*. 121–132. https://doi.org/10.2495/WP200111

DEWATS For Dhulikhel Hospital. (2014). ENPHO. https://enpho.org/wp-content/uploads/2021/12/DEWATS-for-Dhulikhel-Hospital.pdf