Waste Water Treatment Method a Review

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Abstract- **It is well known fact that water is plentiful over the earth is proving to be false, as only 2.5% of all water is freshwater. This limited resource will need to support a projected population of 9.7 billion in 20501; by which time, an estimated 3.9 billion – or over 40% of the world's population – is likely to live in severely water-stressed river basins. It is not just population that is pressurising water resources. Global population tripled in the 20th century, but the use of water increased six-fold. Between now and 2050, water demands are expected to increase by 400% from industry, and by 130% from household use. Present study has tried to treat Wastewater by one of the natural processes of stabilization viz. the wetland system. Feasibility of treatment by conventional methods also has been examined.**

Index Terms- **Wastewater; Grey Water Wetland System; Trickling Filter.**

INTRODUCTION

Grey water is all Wastewater that is discharged from a house, excluding toilet water. This domestic Wastewater contains water from washing machines, showers, sinks, kitchen, dishwashers, laundry tubs and basin. Generally such waste contains soap, shampoo, and toothpaste, food scraps, oils, detergents and hair. 80% of the household wastewater is grey water. In maximum amount grey water makes up the largest proportion of the total wastewater flow from households. Typically, Management of this wastewater is gaining more importance in developing countries where improper management cause environmental pollution.

Wastewater recycling has been and continues to be practiced all over the world for a variety of reasons including; to increase water availability, combat water shortages and drought, and support environmental and public health protection. The increase in water demand is due mainly to the steady rise in the world's population which also generates an increase in wastewater production.

Continuing, it is crucial to ensure that cooperation and coordination between nations about water is available for human, economic and environmental needs. Although hundreds of international water agreements have been signed over time, how countries will cooperatively manage growing resource pressures so that they do not lead to more conflicts over water is not often clear.

Consequently wastewater, if recycled, becomes a significant source of water that could effectively cover for the lack of clear water observed elsewhere. Worldwide, the most common application for wastewater recycling is landscapinga and basic major focus is on agricultural irrigation. However, other options such as industrial, recreational, environmental and urban reuse have been practiced.

LITERATURE REVIEW

Dhokpade S. R. et al. (2014) have elaborated this study; ASP in suspended growth process is common in treatment facility. Biological treatment process is used to remove pollutants. The aim is to study about trickling filter on different aspects with respect to economy, efficiency. They found Trickling filter very effective process. They achieve very positive results by doing some with or without modification to successfully removal of inorganic organic matter and pathogens.

It is concluded that trickling filter is very effective and efficient process in handling. 90% of COD removal is done. It also concluded that feasibility of this system is very efficient and it is economical. Also by doing many modifications system gets more and more efficient.

Hosono Y. et al. (1980) main focus of this study is on Trickling Filter its operation and treatment efficiency.

Operating standard rate filter and high rate trickling filter and both of them quantitively evaluated under so many conditions. The application trickling filter is best limited to rather low BOD loading condition, because of its low BOD removal rate per unit power consumption at high BOD loading.

Chukuounonye Ezeah (2015) this paper, provides treatment to the effluent from domestic, industrial and agricultural activities these are the major sources of pollution on water bodies. For design proposes an alternative method as constructed wetland system for Oro River. For this, provided basin for the good quality of water and to prevent development of unacceptable pollutants level.

For design it is considered or studied many parameter like site selection, hydraulic loading rate, topography etc. in this way researcher deliver maximum Socio-economic and Environmental benefits to entire inhabitants.

Verma R et al (2018) have elaborated this study about Constructed Wetland System for such comparison on HFCW and VFCW in treating dairy waste water. Author designed HFCW and VFCW on the basis of lab scale using typha and dairy waste water parameter have been changed accordingly. They invested all heavy metals for 9 months. Such analysis helped them to get degree of variance which suggests high performance of VFCW and HFCW.

Authors also worked on PCA i.e. Principal Component Analysis which results slight variations in functioning of both the systems i.e. in term of interdependences of organic and inorganic pollution abetments. Variations between HFCW and VFCW are greatly shown by Biomass yield typha. Typha (based on VFCW for dairy waste water treatment) can targets multiple purposes like bio energy, water quality credits, and nutrient capture.

Olusola T. Kayode et al. (2018) this article is based on geo statistical analysis of ground water level quality around municipal waste dumpsite is done. Site located in Oke-Afa, Oshodi/ Isolo. They have collected ground water sample from different sources 8 hand dug wells and two bore wells around dumpsite of municipality. Also determined n numbers of parameters and compared all these values with WHO (World Health Organization) drinking water standard values. It is observed that some of the samples were above the acceptable limits of WHO.

It also contains high quantities of heavy metals such as Aluminium and Barium as noticed from researcher's the data. When concentration levels of contaminants are above the WHO drinking water standards, health implications of tested contaminants can be studied from the given datasets.

Georgios D. Gikas et al. (2018) this study contains removal of pollutants from wastewater. They suggested two methods to removal of pesticides from wastewater of agricultural origin. Constructed wetland and Bio-purification system for removing pesticides from agricultural water. Tested both method/ strategies in the treatment of herbicide terbuthylazine triazine. The planted constructed wetland containing Phragmites australis removed up to 73.3% and constructed wetlands containing typha latifolia removed 53.4% pesticides respectively. It is observed that per manner of planted constructed wetland was superior to unplanned constructed wetland. They use bio mixture in BPS to remove turbuthyphylazne concentrations in plant material. However they stated that the Bio mixture failed to detoxify the matrix according to ecotoxicological test of seed germination.

Guike Lin et al. (2017) the influence of oxidation coefficient of various products of SS treatment in SCW was thoughroly study by researcher. They also investigated SS treatment in SCW for short preheating and noted down the reaction time for determining optimum treatment method and condition. Researcher found that with increasing OC or temperature, CO_2 need increases.

- OC affect the COD removal efficiency and NH_3-N concentration of liquid product.
- They used GC-MS analysis for liquid phase, dry basis (surface morphology) for solids, gas chromatograph equipped with TCD was use for determination of gas phase product.
- Mass spectral library and computer machinery were use for compound identification.

Amr M. Abdel- Kader (2013) has elaborated Rotating Biological Contactor. Used mathematical model to investigate the performance and treatment efficiency or capacity of (RBC) Rotating Biological Contactors to treat grey water. To propose RCB plant researcher studied about GPS-X simulation to simulate the plant. Plant includes three basic parts of Rotating Biological Contactors, first is RBC unit other part is

settling tank unit and last is disinfection tank unit. After this model optimization, they used three different types of concentrations of grey water to run the proposed mathematical model. They used low, medium and high concentrations of grey water, to run the model . This proposed model was verified by using data which author took from RCB experimental pilot plant. This study showed results that, the treatment efficiency of RCB system based on BOD removal was ranged in between 93% and 96%. The treatment efficiency based on TSS removal was ranged about 84% and 95% for all three different concentrations of influent grey water.

DISCUSSION

1. Constructed wetland systems have aesthetical appeal it is appropriate method for small communities. Its operation easier and reliable treatment is provided. Operation and Maintenance required.
2. Trickling filters are flexible in operations it contains less mechanical equipment. Working of trickling filter is simple. But the cost of construction is high.
3. Maintenance and operation of oxidation pond is easy its operation is natural one and hence reduction in cost as compared to some other treatment option. These ponds may sometimes become septic due to over loading.
4. Rotating biological contactors have no risks of channelling. Process stability is high. It produces low sludge Rotating Biological Contactors. It requires continuous electricity. Skilled supervision requires permanently, so it is not cost effective.

CONCLUSION

Economically availing of natural purification process is advisable rather than to opt for energy intensive treatment method which also need trained manpower which may not available in rural areas. Beauty of this system is there is no need of mechanical equipment, no construction cost, not even required electricity. This method is cost effective. Provides environmental friendly treatment. Treated water can be used in agriculture purpose.

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