Reduction Of The TDS, TSS, COD, BOD, Turbidity, Present In Waste Water By Using Wetland In Domestic Waste

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Abstract- *Domestic waste water consist of lot of TDS , TSS , COD , BOD, Turbidity because of it consist of kitchen waste , for proper lifting by using pumping it is necessary to remove TDS , TSS , COD , BOD, Turbidity it also affect on recycling and reuse of domestic waste water.*

Keywords- TDS, TSS , COD , BOD, Turbidity

I. INTRODUCTION

In wetland it consist of no of filter beds such as soil , sand, aggregates, it also consist of plants which have property of nitrogen cell production . by using sedimentation theory and plant growing technique results shows reduction in TDS , TSS , COD , BOD, Turbidity

II. LITRETURE REVIEW

1. G.Baskar, V.T.et.al. (2014)

The wetland is constructed in shallow pits installed with a drain pipe in a bed of pebbles or gravels and sand layers planted with native vegetation. An impermeable membrane is provided at the bottom to prevent percolation of wastewater into the soil or aquifer below. The vegetation may be emergent macrophyte, floating plant or submerged plant species. The main characteristics affect the removal efficiency of constructed wetland are the vegetation type, hydraulic residence time and substrate. The aim of the present study is to examine effect of vegetation type on organic and nutrient removal under varying hydraulic residence time in constructed wetlands. A 6-day hydraulic residence time is suggested for an acceptable level of treatment in these systems.

2. Kavya S Kallimani, et.al. (2015)

The constructed wetland have gained significance for treatment of wastewater and is considered as successful optional for treatment system. The major components of the constructed wetland are vegetation type, hydraulic retention time (HRT) and bed media. The main aim of the present study was treatment of untreated wastewater from campus through horizontal subsurface flow constructed wetland and compare the efficiency of two different plants. Sand and gravels were used as bed media and plants were used for experiment were PhragmitesAustrails (CW1) and Canna Indica (CW2). In this paper we are evaluated performance of PharagmitesAustrails and Canna Indica in subsurface flow systems for removal percentage of pollutants such as Chemical oxygen demand(COD), Biochemical oxygen demand (BOD3) ,Total solids (TS) , Total suspended solids (TSS) , Total dissolved solids (TDS) and Phosphate at different Hydraulic retention time.

3. Mr. Rajnikant Prasad, et.al.(2016)

The municipal treatment plant generally treats the wastewater of cities and disposes off safely nearby in the developing and the developed countries. The condition of the rural areas remains a problem where the treatments are not given to the wastewater in such areas the constructed wetland is option for the treatment of wastewater. Constructed wetlands are engineering systems which are designed to treat wastewater from various sources. The aim of this study is to find out the economical method of treatment of domestic wastewater and to compare the efficiency of naturally aerated and artificially aerated constructed wetland. study was done for the mundhwa area by constructing lab scale model. The parameter like colour, odour, pH, COD and DO was checked. 4. Chethana S. L, et.al. (2016) The natural method of refining the problem has been a suitable method in comparison to other refinery methods. Natural method is applied by means of Phragmites and Persicariaamphibia. This method has good advantages such as, easy management, low cost, low technology required, and finally yet importantly, low energy consumption. Enhancing the Phragmites refinement efficiency, other kind of weeds has been used, persicaria has unique morphological, genetic, and physiological features. a comparison between the refinability of Karanji lake water by persicaria and phragmites was made. The results were based on the findings obtained from this research the removal rate of nutrients.

5. Urmila M. Bhanuse1, et.al. (2017)

Horizontal sub-surface flow constructed wetland have been used from 30 years. The classification of constructed wetland is based on the vegetation of constructed wetland is based on the vegetation type, hydrology & subsurface flow can be further classified according to the flow direction. The consumption of large volumes of water and the generation of organic compounds as liquid effluents are major environmental problems in milk processing industry.

6. Suma, et.al. (2017)

Due to rapid urbanization, mining activities, industrialization, etc. the water resources both surface and subsurface are getting polluted which is difficult to treat, recycle and the treatment requires high cost. The present study deals with the Phytoremediation for the domestic sewage treatment by Hibiscus Rosa and CatharanthusRoseus plant species. two plastic crates were used to plant the Hibiscus Rosa and CatharanthusRoseus in each separate crate. The vertical subsurface flow has been adopted in this study with two beds of aggregates and red soil. The bed consist bottom layer of coarse aggregate with 12 mm size and 6 cm depth, middle layer of fine aggregate with 2.36 mm size and 6 cm depth, Top layer was filled with red soil of size 0.6 mm and 6 cm depth. Then the physico-chemical characteristics of domestic sewage such as Turbidity, pH, TSS, BOD, COD, Nitrates and Sulphates were done before treatment and after the treatment and compared with the CPCB standard.

7. Swathy M R, et.al. (2017)

Food industry produces large quantities of wastewater from processing, making and cleaning processes. Improper treatment and disposal of wastewater cause many environmental issues. In this study a cost effective method for treatment of food industry wastewater using locally available plants was used. The plants used for this study was cyperus IJSART - Volume 3 Issue 8 –AUGUST 2017 ISSN [ONLINE]: 2395-1052 Page | 596 www.ijsart.com rotundus and pennisetumperpureim which is known as nut grass and Napier grass respectively. Two reed beds and one reed less bed were prepared and wastewater was allowed to pass through it. The effectiveness of these plants in pollutant removal from wastewater was analyzed by varying hydraulic retention time 1,2,3,4,5,6 days. The characteristics of water samples before and after treatment were compared and discussed.

8. Pharne P N, et.al. (2017)

This paper on wet land construction in India. It shows low cost waste water treatment process in less energy consumption**.** Simple filters are provided from locally available materials such as river sand, sea sand, charcoal, aggregates, soil etc. It also consist of use of special plants to filter or remove toxic materials in waste water.

III. OBJECTIVES

The objective of the project are mentioned as below

•To reduce the TDS, TSS, COD, BOD, Turbidity, present in waste water

IV. METHODOLOGY

For this work it is proposed to carry out the work in the following phase
Phase- I
Comprehensive review of literature to understand wetland concept
Phase –II
Collection data through visiting wetland site
Phase-III
Analysis the data and determining the parametric standards
Phase -IV
Developing a model
Phase -V
Validation of propose model through case study

V. SEDIMENTATION (WATER TREATMENT)

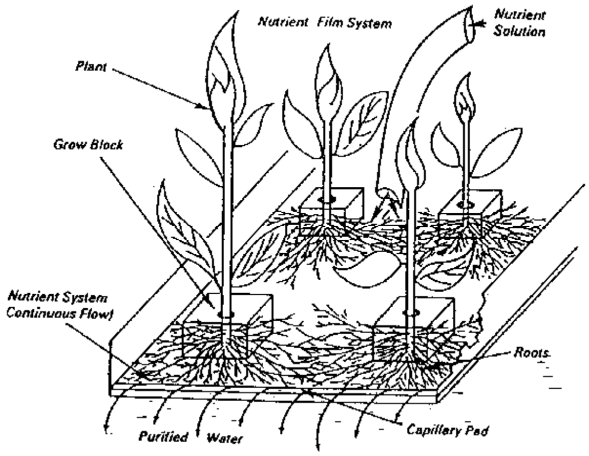
Sedimentation is a physical water treatment process using gravity to remove suspended solids from water. Suspended solids is the mass of dry solids retained by a filter of a given porosity related to volume of water sample. Sedimentation is a separation of suspended particles that are heavier than water. The sedimentation of particles are based on the gravity force from the differences in density between particles and the fluid. Sedimentation is widely used in waste water treatment systems. A successful sedimentation is crucial for the overall efficiency of the plant. The implementation of nitrogen removal in many Swedish plants emphasis the importance of the settler. The slow growth of nitrifying bacteria means that a high sludge age is necessary in the activated sludge process. For a give volume of the aeration basin, the sludge age may be increased by using a higher sludge concentration in the basin. However, by increasing the sludge concentration in the aeration basin, the capacity of the settler may be reached, the sludge blanket level will then increase which finally result in an uncontrolled sludge escape in the effluent water. Hence there is a possible conflict between operation for good nutrient removal (high sludge age) and operation for good sludge sedimentation. Further, nitrogen removal in the activated sludge process gives also a risk for sludge rise in the secondary settler due to denitrification in the bottom of the settler. The sludge may rise due to flotation of solids when nitrogen gas is released.

VI. NUTRIENT FILM TECHNIQUE

The nutrient film technique (NFT) is a modification of the hydroponic plant growth system in which plants are grown directly on an impermeable surface to which a thin film of wastewater is continuously applied (Figure 10). Root production on the impermeable surface is high and the large surface area traps and accumulates matter. Plant top-growth provides nutrient uptake, shade for protection against algal growth and water removal in the form of transpiration, while the large mass of self-generating root systems and accumulated material serve as living filters. Jewell **et al.** (1983) have hypothesized the following mechanisms, taking place in three plant sections:

- Roughing or preliminary treatment by plant species with large root systems capable of surviving and growing in a grossly polluted condition. Large sludge accumulations, anaerobic conditions and trace metal precipitation and entrapment characterize this mechanism and a large portion of wastewater BOD and suspended solids would thereby be removed.
- Nutrient conversion and recovery due to high biomass production.
- Wastewater polishing during nutrient-limited plant production, depending on the required effluent quality.

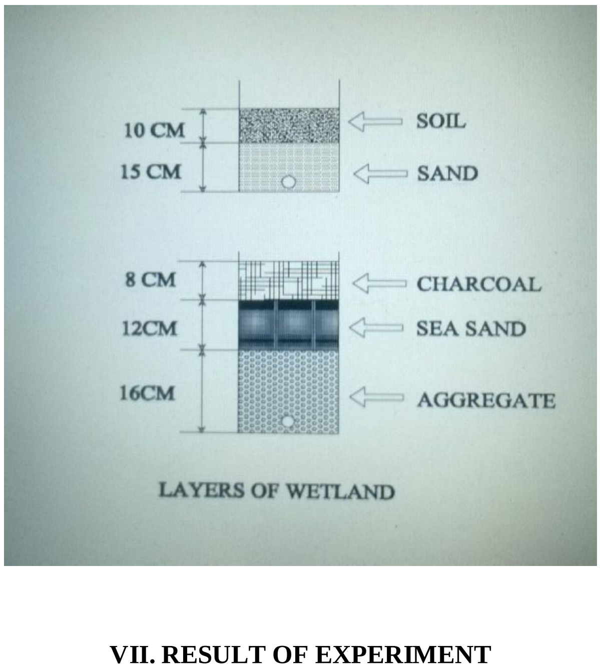
A three year pilot-scale study by Jewell **et al.** (1983) proved this to be a viable alternative for sewage treatment. Reed canary grass was used as the main test species and resulted in the production of better than secondary effluent quality at an application rate of 10 cm/d of settled domestic sewage and synthetic wastewater. The highest loading rates achieved were equivalent to treating the sewage generated by a population of 10,000 on an area of 2 ha. Plants other than reed canary grass were also tested and those that flourished best in the NFT system were: cattails, bulrush, strawflowers, Japanese millet, roses, Napier grass, marigolds, wheat and phragmites.



Canna Indica

Canna indica is commonly known as Indian shot, African arrowroot, edible canna, sierra Leone arrowroot, is a plant species in the family cannaceae. It is native to much of south America, central America, the west indies, mexico, and the south eastern united states. It is also naturalized in much of Europe. Canna indica is a plant of tropical or subtropics origin in south America, distributed over vast area, reaching southern region as province of Buenos aires (PBA) in argentina (350 south lattitide).

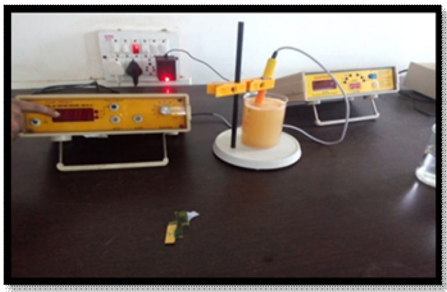
Design of wet land-



VII. RESULT OF EXPERIMENT

1. P^H level of wastewater:

SAMPLE	READING BEFORE	READING AFTER (Canna Indica)	READING AFTER (CatharanthusRoseus)
Sample 1	6.0	6.4	6.9
Sample 2	6.0	6.4	6.9
Sample 3	6.0	6.4	6.9



P^{H}METER

P^{H} PAPER

P^{H}PEN

2. Total Solid:

	Sample	Volume of sample	W1 (gm)	W2 (gm)	W2-W1 (gm)	Average (mg/lit)
BEFORE	Distilled water	10	0	0	0.0	586000
	Waste water	10	17.732	23.592	5.86	
AFTER(Canna Indica)	Distilled water	10	0	0	0	
	Waste water					

3. Suspended Solid Particles:

	Sample	Volume of sample(ml)	Before 24 hours (w2) (gm)	After 24 hours (w2) (gm)	W3-W2 (gm)	Average (mg/lit)
BEFORE	Sample 1	10	1.165	1.170	0.005	1833.33
	Sample 2	10	1.097	1.114	0.017	
	Sample 3	10	0.843	0.876	0.033	
AFTER (Canna Indica)	Sample 1					
	Sample 2					
	Sample 3					

Sensitive balancer

❖ BEFORE :-

Total Solid- Suspended solid = 586000-1833.33
= 584166.67 mg/lit

❖ AFTER :- (Canna Indica)

Total Solid- Suspended solid =

4. Turbidity: (Naphelometric Turbidity Meter)

BEFORE	Sample	Reading(ppm)	Average (ppm)
	Sample 1	97	98
	Sample 2	98	
	Sample 3	99	
AFTER (Canna Indica)	Sample 1		
	Sample 2		
	Sample 3		

Propose model through case study

VIII. CONCLUSION

The quality of raw wastewater was analysedfor the various parameters such as Chemical Oxygen Demand (COD), Biological Oxygen Demand (BOD), Total Suspended Solids (TSS), P^H, the comparison shows positive result of wetland up to permissible limit

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