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Project Title: COST EFFECTIVE MECHANISM TO TREAT WASTE WATER ON SHERI NALLA, SANGLI

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ABSTRACT

The waste water is any water that has been affected by human use. Wastewater is "used water from any combination of domestic, industrial, commercial, surface water or storm water, and any sewer inflow or sewer infiltration. The characteristics of wastewater vary depending on the source. The main objective of this study is to develop cost effective treatment technology for sewage treatment. Assessment of this mechanism for sewage treatment and disposal is conducted. The term WETLAND encompasses the life interactions of various species of bacteria, the roots of reed plants, soil, sun and water. They are also known as constructed wetlands or subsurface flow systems. But in case of continuous discharge of waste water, wetland alone might not treat waste water, in this case we can use this mechanism. By constructing bandharas in the treatment we can increase the efficiency of wetland and providing the screens we can separate the solid waste from flow.

Proposed site for this treatment plant is situated on Sheri Nalla, Sangli. As per the surveying report, horizontal flow is suitable for this site. The rate of waste water generation is more and it further meets to Krishna river sangli. It effects on purity of river water as no further treatment is given to waste water before sent to the river.So, it is necessary to treat the waste water by Root Zone Technology. This technology will helps to decrease the concentration of waste water and it can be used in agriculture purpose, or it can also improve the ground water level which is beneficial in drought areas.

LITERATURE SURVEY

1. **Mahesh Mane, BhupenPatil, MohitPawar,YatinGohil (March2017)**

   This paper presents the analysis of waste water treatment through wetland and comparing the treatment the purity of water through root zone with conventional treatment plants. It also gives information that Reed beds can help to archive a better standard of better standard of water quality through High level bacterial removal and viral removal, Decreased biological oxygen demand and reduction of suspended solids. This method is useful at septic tank outlet treatment, Bathroom water recycling method etc.

2. **A.A.Raval, P.B.Desai (2015)**

   They state that,increasingurbanisation and human activities exploits and affect the quality and quantity of the water resources. So ROOT ZONE TREATMENT SYSTEM (RZTS) which areinplanted filter beds consisting of a soil is introduced. This technology uses a natural way to effectively treat domestic and industrial effluents. RZTS are well known in temperate climates and are easy to operate having less installation, low maintenance and operational costs and incorporates the self- regulating dynamics of an artificial soil eco-system.This technology has been successfully running in several countries like Europe and America.

3. **Kalpanakumarithakur, AvinashBajpai, And Shailbala Singh Baghel. (2014)**

   They state thar ROOT ZONE SYSTEM's are artificially preapaired wetlands comprising of clay or plastic lined excavation and emergent vegetation growing on gravel or sand micxtures and it is known as CONSTRUCTED WETLANDS.This method combines mechanical filtration, chemical precipitation and biological degradation in one step for the treatment of wate water.

   A no. of factores like low operating cost, less enery requirement and ease of maintenance attribute to making root zone system and attractive alternative for waste water management. The process in RZS to treat the sewage begins with passing the raw influent(after removing grit or floating material) horizontally or vertically through a bed of soil having impervious bottom. The influent percolates through a bed that has all the roots of the wetland plants spread

very thickly, nearly 2005 types of bacteria and 10000 types of fungi,whichherbor around roots, get oxygen form the weak membranes of the roots and aerobically oxidise the organic matter of influent.

4. **Binita Desai And Pratibha Desai (2014)**

This paper states that RZT is considerd as energy efficient and cost effective for sewage water treatment. This process involved in this treatments is either aerobic an aerobic or composition requiring number of mechanical and electrical items therby requiring substancial energy. The evergrowing need of energy makes the design, operation and maintenance of STP a challenging task. The convential method of nsewage treatment can be made nefficient by advance technologies and intelligent supervision.

5. **G.Basker, V.T. Deeptha and A.AbdulRahaman (2009)**

They states that pollutents are removed by various physical chemical and biogeo chemical processes like sedimentation absorption and neutrification as well as through uptake by wetland plants.

They planted a PhragmitesAustralis species which is effective for wetland system. This species were growing in the field of a campus with fresh water. The raw waste water and treated waste water was collected periodicaly and tested for quality. It is seen that this wetland unit is reducing the concentration of TSS, TDS, TN, TP, BOD, COD by 90%, 77%,85% 95%,95% and 69% respectively on an average.

6. **Jaime Nivala, Scott Wallace, Tom Headley, Knife Kassa, Hans Brix, Manfred van Afferden, Roland Muller (2012)**

This paper reviews the mechanism of oxygen transfer and consumption in treatment wetlands and provides an overview of the methods used to estimate oxygen transfer rates in this treatment system. This paper also gives knowledge that oxygen release rates vary with plants species and seasons, as well as with the oxygen demand of the surrounding environment. The intensified wetland systems easily out-perform passive horizontal flow and gravel based

wetland treatment system.

7. **Fabio M. and Nicola M. (2007)**

Constructed wetlands can be subdivided into two main categories: surface- flow or subsurface-flow design. In surface-flow wetlands the wastewater flows through a shallow basin planted with emergent and submerged macrophytes. These kinds of system are mainly exploited for tertiary treatment or polishing stage and also in several cases of diffuse pollution. In subsurface flow or "Reed-bed" treatment systems, the wetland is filled with gravel or sand or similar substrates, and the plants, most commonly reeds (Phragmitesaustralis or communis), grow rooted in the filling medium. The direction of the water flow provides the names of the two most diffused designs for RBTSs, the horizontal flow and vertical flow systems.

PROPOSED WORK

We all are familiar with wetland system in which water is treated by the roots of the reed plants. This is very successful method for houses or for small discharge of waste water. But in case of continuous discharge of waste water wetland alone might not treat waste water, in this case Cost effective mechanism is useful. The process is as given below:

Waste water of nalla contains solid waste which may affect the whole treatment so as to remove this solid waste screens are used. The aeration is most important in any water treatment, so we can construct the bandharas and gravel filters for aeration purpose. Solid bandhara is helpful in providing the sedimentation tank where sludge particles may settle down. And finally we can construct the wetland to treat the waste water of Sheri Nalla.

RELEVANCE OF WORK

Cost effective mechanism is the method to treat waste water from industries, residential area and others which further can be used to increase ground water recharge, agriculture and gardening. This method mainly comprises wetland system which consist of sand, gravels, and charcoal along with reed plants. This system ultimately reduce the concentration of TDS, BOD, COD, and DO of waste water. Waste water includes plastic, sludge and solid waste which directly or indirectly affects the human health, underground water and agriculture which is removed by screening. Therefore, by treating such type of polluted water, we can increase efficiency of wetland and aeration system by constructing porous bandhara which results better water purification treatment plant. This method is beneficial in draught areas.

METHODOLOGY

1. Site selectionProblem Identification
2. Literature Review
3. Waste water sample testing
4. Planning, Design, Construction
5. Examining the treated water
6. Collection of relevant research data formation and international journals, technical magazine, reference books and through internet

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