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Literature Survey on Raw Water Treatment

Suvan Paul¹, Shubham Mahatme², Karun Tiple³, Snehal Kewale⁴, Rupali Hirdekar⁵, Guided by, Nilesh R. Pal⁶
^{1, 2, 3, 4, 5, 6}Department of Civil Engineering, JD college of Engineering and Management, Rastra Sant Tukdoji Maharaj Nagpur University, India

Abstract: Literature survey on purification of raw water is the procedure of basic experience of mankind. So, as research scholars, we first go via our ancient techniques to purify the water mentioned in religious books like Veda's and many greater ancient books. Those techniques were once exceedingly correct after going via that techniques, in modern times troubles stand in the front of us, the volume of pathogenic substance is way greater than those historic years.

Therefore, we had decided to word on recent purification techniques of raw water and after that we have lookup on numbers of research papers and utterly studied them to pick out the great possible methods with low cost and excessive efficiency.

So, after all the research we have completed thorough our journey all the element evaluation of papers and survey. And conclusion gisted from that which is talk about in our paper.

I. INTRODUCTION

In this world there are so many strategies were adopted with the aid of our ancestor, in view that our morya dynastic however the key assumes of those cure procedures that it was organic techniques which cannot in a position to create any kind of pathogenic substance for human races.

But the time rapidly changed, via the ride of mankind, human beings developed a number form of physical, biological and chemical system to purify water.

Although we understand the water is most vital substance for residing being. But after industrialization the wastage of water and purification system or recycle procedure barely different.

So as a lookup scholar, we utterly go via all the procedure of water purification machine and make a detail survey on lookup work of a variety of scientist and after the analysis of those paper the most fantastic approach to purify water is developed wetland method, which depends upon the key word like phytoremediation, filtration bed, adhesive quality of material and most importantly natural system to purify the water.

II. LITERATURE REVIEW

A. *Four Stage Hybrid Constructed Wetland Treating Low Strength Of Aquaculture Waste Water With And Without Artificial Aeration- Shi Yang Z Hang, Gulili, Xiaoli, Liling Too Environmental Protection Engineering 2015*

“In this system, various types of CW may be combined to achieved high purifying performance for aquaculture waste water horizontal plus surface flow may be the ideal combination due to their high volume and low strength”

“The hybrid CW system comprised four wetland units i.e. three horizontal subsurface flows followed by one free water surface flow. Due this combination of four stage CWs low strength aquaculture wastewater is occurred. The artificial aeration improved the treatment performance of CW and more ammonium could be nitrified into nitrates which then absorbed by the aquatic plants in surface flow.”

B. *Subsurface flow Constructed Wetland for the Treatment of Waste Water From Different Sources. Design and Operation- Antonio' Torrens Arnengol, University of Barcelona Phd thesis*

“In general, subsurface flow constructed wetland have proved to be a sustainable and efficient technical solution to treat small waste water flow with special characteristics. Subsurface flow constructed wetlands have shown resilience to load and hydraulic fluctuations, to new pollutant and to environmental variable condition; being simple to operate and maintain with null or minimum energy requirement and with an added aesthetical value.”

“The main conclusion of this thesis is the viability of the application of different configuration of subsurface flow constructed wetlands to treat the effluents from a waste water treatment pond, a pig farm, and car wash facility, once design and operation have been optimized.”

C. *The Concept Of Construction Of Hybrid Constructed Wetland For Waste Water Treatment In The Roztocze National Park- Michal Marze, Tomasz Slowi ,University Of Life Science In Jublin Poland, 2012*

“Roztocze National Park (RNP) is one of 23 national park in Poland. It was created in 1974 both to protect the natural and cultural heritage as well as to share the park area for science, education and tourism.

Part of these actions includes the application of innovative technologies for water and waste water. The paper presents the solving the problems of waste water treatment by means of hybrid constructed wetland in three villages in the forest of RNP. It easy and simple operation.”

D. *Design And Development Of Two Novel Constructed Wetland: The Duplex Constructed Wetland And The Constructed Wetroof- Moribas Zapater Peveyor ,2015 Under UNESCO-IHE.*

“Constructed wetland are manmade technologies, which mimic natural system and there processes, to treat waste water flowing through filter media and plants. 1.A conventional HF CW used as a control system. 2.An aerated system and 3.A hybrid system, composed of a shallow aerated HF CW.

The aerated system includes two aeration tubes at the bottom of the container that were connected to an air blower and to optimize the nitrogen removal efficiency. Artificial aeration can increase the systems efficiency per unit area, and subsequently reduce the HF CW.”

E. *Vertical Subsurface Flow Constructed Wetland For Domestic Waste Water Treatment- MC Perdanel- SCI Journal Earth Environment 148012025 (ICERM 2017) (LOP publication)*

This study aimed to compare which species is more recommended to be applied for reducing organic material and neutrients in domestic waste water. This experimental study applied four treatment, i.e. 1) control (unplanted), 2) single species *Iris pseudacorus*, 3) single species *Echinodorus palaefolius*, and 4) combination (*Iris pseudacorus* and *Echinodorus palaefolius*) with tree days of retention time.

The plant were planted on vertical subsurface flow constructed wetland. The parameters measured pervade TDS, pH, BOD, COD, Nitrate, and phosphate. The result shows that there was a significant difference of nitrate phosphate reduction between control three other treatment, while pH parameter showed non-significant change among them. In term of performance, *Iris pseudacorus* seemed showed a preferable achievement.

F. *“Pilot Scale Study: Use Of Subsurface Flow Constructed Wetlands For Domastic Wastewater Treatment In Sri Lanka” P M G Pathiraja (National Engineering Research Centre, Sri Lanka) ,N P T Perera (National Engineering Research Centre, Sri Lanka)*

Water is one of the important elements involved in the creation and development of healthy life. One of the commonly found environmental problems in developing countries is water pollution caused by direct disposal of untreated wastewater. Discharging untreated effluent into water source or land may cause environmental degradation and serious public health risk with the increased population density.

And for the solution of that Sri Lanka used sub surface Horizontal flow system of Constructed wetland to treat domestic gray water and comparison of three types of commonly available reed varieties. In Horizontal type of CW, the flow of water is provided horizontally (Common reed, leaf cattail and bulrush).

By adapting this method, it is concluded that out of three reed varieties, highest propagation was observed in common reed while lowest was observed in Bulrush and treat waste water ues to fulfill the future demand of water and control on water pollution.

G. *“Constructed Wetlands For Wastewater Treatment” Chart Chiemchaisri (Thailand), Ulo Mander (Estonia) And Sandra Furlan Nogueir (Brazil) Draft 2013 Wetland Supplement*

Constructed wetlands system is fully Home-made wetland for raw water treatment. Which apply various technological designs, using natural wetland process, associated with wetland and technology, soils, microbes and plants. This system has been designed and constructed to utilized the Natural process involving wetland vegetation to assist in treating seawater constructed. Wetland may be categorized according to the various designs parameters, but the three most important criteria are water Surface and Subsurface flow (Horizontal and Vertical) and Hybrid or Combine system. In this they are adapting all this method for various purpose like for Greenhouse gases emission, Nitrous emission.

H. *Hybrid Constructed Wetlands for Wastewater Treatment: a Worldwide Review* m.h. Sayadi, r. Kargar, m.r. Doosti, h. Salehi
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The utilization of environmentally friendly and eco-safe wastewater treatment plan is nowadays widespread. This study aimed to assess the potentiality of hybrid constructed wetlands for treating of landfill leachate, river polluted water, domestic, industrial, hospital, runoff and agricultural wastewaters in lab-scale, pilot-scale and full-scale with various configurations. The results revealed that the hybrid constructed wetlands are effective to remove organic matter (BOD₅, COD) and suspended solid, while in terms of nutrient removal such as N and P components, the removal efficiencies were depending to system properties and operational condition.

Treatment of wastewater plays a vital role on human health; furthermore, the limitation of water resources and sustainable use of alternative water sources have led to demand for the development.

There are the different conventional methods for wastewaters treatment: - such as active sludge process (ASP), rotating biological contactor (RBC), stabilization ponds, oxidation ditch, trickling filter (TF), sequence batch reactors (SBR), lagoons and up flow anaerobic sludge blanket (UASB), Micro-algae techniques etc. Constructed wetlands (CWs) as human made basin according to engineering design that create ecological condition same to natural wetlands for treating wastewater in different physical, chemical and biological conditions. In this study, application of hybrid CWs with various configurations for different wastewaters is reviewed as following: a) Domestic wastewater b) Industrial wastewater c) Landfill leachate d) Other wastewaters.

III. CONCLUSIONS

After inspecting atop research papers, one over the nearly appropriate and sustainable technique together with respect in accordance with all the views of cost, sustainability, purification thing is constructed wetland method as additionally an organic method. So, we prolong towards the design on advanced type of constructed wetland which gives more durability and stability.

REFERENCES

- [1] Four stage hybrid constructed wetland treating low strength of aquaculture waste water with and without artificial aeration- Shi yang Zhang, Gulili, Xiaoli, liling too Environmental Protection Engineering 2015.
- [2] Subsurface flow constructed wetland for the treatment of waste water from different sources. Design and operation- Antonio Torrens Arnengol, University of Barcelona PHD Thesis.
- [3] The concept of construction of Hybrid constructed wetland for waste water treatment in the Roztocze National Park- Michal Marze, Tomasz Slowi, University of life science in jublin Poland, 2012.
- [4] Design and Development of two novel constructed wetland: the Duplex constructed wetland and the constructed wetroof- Moribas Zapater peveyor, 2015 under UNESCO-IHE.
- [5] Vertical subsurface flow constructed wetland for domestic waste water treatment- MC perdanel- SCI journal earth environment 148012025 (ICERM 2017) (LOP publication).
- [6] Pilot scale study: use of subsurface flow constructed wetlands for domestic wastewater treatment in sri lanka" P M G Path raja (National Engineering Research Centre, Sri Lanka), N P T Pereira (National Engineering Research Centre, Sri Lanka)
- [7] "Constructed wetlands for wastewater treatment" Chart Chiemchaisri (Thailand), Ulo Mander (Estonia) and Sandra Furlan Nogueir (Brazil) Draft 2013 Wetland Supplement.
- [8] Hybrid constructed wetlands for wastewater treatment: A worldwide review M.H. Sayadi, R. Kargar, M.R. Doosti, H. Salehi Received 18 June 2012; Accepted 25 July 2012; Published online 1 December 2012.
- [9] Constructed Wetland As Sustainable Waste Water Treatment Method In Communities -Eizein.Z, Abd Eigawad.I (Cairo, Egypt, University Of Letlwan) -Proeediaenvironmental Science 34-2016
- [10] "Waste Water Treatment Using Vertical Subsurface Flow Constructed Wetland In Indonesia" -Denny Kurnoidie, (Indonesia, American Journal Of Environment Science 7(1):15-19, 2011)
- [11] "Hybrid Constructed Wetland For Waste Water Treatment" -M.S. Sayadi, R. Karagar, M. Rdoosti, H. Salchi (Iran, University Of Birjand) -Proceedings Of International Academy Of Ecological And Environment Sciences-(2010) 2(4):204-222.
- [12] "Domestic Waste Water Depuration Using A Horizontal Subsurface Flow Construction Wetland And Theoretical Surface Flow Constructed Wetland And Theoretical Surface Optimization :A Case study Under Dry In Meditarian Climate"-Pedro Andrio- Martinez, Neria Gareia- Martinez, Levis Almela (Dept. Of Agricultural Chemistry, University Of Murcia Campus Of Spxardo)- 5-10-2016 (MDPI)
- [13] Horizontal Subsurface Flow And Hybrid Constructed Wetland System For Waste Water Treatment JAN VYMAZAL (Duke University Wetland Center Durhin) NC 27708 USA - Ecological Engineering 25 (2005) 478490. (Science Direct).
- [14] "Pilot Seale Study: Use Of Subsurface Flow Constructed Wtland For Domestic Waste Water Treatment In Shrilanka." -PMG Path raja, NPT Perora, (National Engineering Research And Development Centre Shrilanka)
- [15] "Constructed Wetland For Domestic Waste Water Treatment- JAN VYMAZAL (EZECHUNIVERCITY OF LIFE SCIENCE EZECH Republic)-Water (2010) 2,530-549; Dai:10.3390/W2030530
- [16] "Hybrid Constructed Wet Land System For Decentralized Waste Water Treatment E.Kinsley, A.Knalla, J. Rode, R. Zytner (University Of Guelph) -Ontario Rural Waste Water Centre (2014)



- [17] "Effectives Of Pollutants Removal In Hybrid Constructed Wetland – Different Configuration Case Studies"-Magdalena Gajuska, Krzysztof Jozwia Kawski- (Lublir , Poland –Web Of Conference EKO-DOK2017)
- [18] "Constructed Wetland For Waste Water Treatment M.Sundaravadivel , S.Vigneswaran (Graduate School Of Environment MACQUARIE University) Sydney Australia (UNESCO-EOLSS)
- [19] " Constructed Wetland For Waste Water Treatment" – Chart Chiemchaisri (Thailand) , Uloma Mander (Estonia) Sandra Furlan Noguciro (Brazil) – DRAFT (2013) Wetland Supplement.
- [20] "Constructed Wetland For Waste Water Treatment And Reause A Case Study Of Developing Country – Atisf Mustafa International Journal Of Environmental Science And Development, Vol 4, 1 Feb 2013.
- [21] "Ecological Approach Of Campus Waste Water Treatment Using Constructed Waste Water Water Treatment"- E T Winante, E Rahmadyanti And I N Fajarwati, University Surabaya , Indonesia.
- [22] "Comparison Of Nitrogen Iretention In Wetland With Different Depths – Jes Marry Thomos (England) Dec 2017 Halmstad University.
- [23] "Development Of Simulation Tool For Subsurface Flow Constructed Wetland" Langergraber G, (2001) Wiener Mitteilugen 169,Vienna,Autria.



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