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A REVIEW ON ASSESSMENT OF SUITABILITY OF TREATED WASTE WATER IN AGRICULTURAL AND DOMESTIC PURPOSES

Ravindranath C[*1], Mounesh[*2], Narendra Naik[*3], Pavankumar R[*4], Prashantkumar VD[*5]

[*1]Professor, Department Of Civil Engineering DSCE, Bengaluru, Karnataka, India.

[*2,3,4,5]UG Students BE, Department Of Civil Engineering DSCE, Bengaluru, Karnataka, India.

ABSTRACT

Water is one of the vital needs of all living beings. Humans need water in many daily activities like drinking, washing, bathing, cooking etc. If the quality of water is not good then it becomes unfit for drinking and other activities. The quality of water usually described according to its physical, chemical and biological characteristics. Hence it becomes necessary to find the suitability of water for , irrigation and domestic purpose. The groundwater quality based on Sodium percent, Sodium Absorption Ratio and Residual Sodium Carbonate will help to identify the suitability of water for irrigation purpose. Rapid industrialization and use of chemical fertilizers and pesticides in agriculture are causing deterioration of water quality and depletion of aquatic biota. Due to use of contaminated water, human population suffers from water borne diseases. Parameters that may be tested include temperature, pH, turbidity, salinity, nitrates, TDS, Cations, Anions and phosphates. In this study the suitability of treated waste water quality for domestic and agricultural purposes was assessed based on the various water quality parameters. Treated waster is collected from the HN valley to analyse. The quality analysis is performed through the estimation of pH,TDS, total hardness, total alkalinity, Na, K, Cl, NO3, SO4, DO, BOD etc.

Keywords: Treated Waste Water, Chemical Compositions, Human Helath, Agriculture And Domestic Impact.

I. INTRODUCTION

Water is one of the most important and most precious natural resources. It is vital to man's existence and without it, there would be no life on earth. The earth holds approximately 1.4× 109 cubic kilometers of water in the form of oceans, seas, rivers, lakes, ice, etc. but only 3% of the total available water resources are in the form of fresh water found in rivers, lakes, and groundwater. The water that is needed for people is limited, and demand far exceeds the available supply due to increasing population and industrialization. so, treatment of waste water is one of the most important necessities of the current scenario. Treated waste water construction, toilet flushes,fire fighting activities. It can also be used in the thermal power plants.at global level treated waste water supports agricultural yield and levilihoods of millions of farmers. China stands out as the leading country in asia for the use of waste water. Treated waste water contains various type of nutrients such as phosphorus, nitrogen, potassium, and sulphur, but the major amount of nitrogen and phosphorus available in waste water can be easily accumulated by plants , that's why it is widely used for the irrigation.

II. LITERATURE REVIEW

1. Kavindra kumar kesari and Ramendra soni, "wastewater Treatment and Reuse : a review of its application and health implications" . Paper published in year of 2021. In this study they have reviewed environment they have reviewed environmental and public health issues associated with the use of untreated wastewater in agriculture. We have focused on the current state of affairs concerning the wastewater treatment model and computational approach. Given the dire need for holistic approaches for cultivation, we proposed the ideas to tackle the issues related to wastewater treatment and the reuse potential of the treated water. Water resources are under threat because of the growing population. Increasing generation of wastewater (municipal, industrial, and agricultural) in developing countries especially in India and other Asian countries has the potential to serve as an alternative of freshwater resources for reuse in rice agriculture, provide appropriate treatment, and distribution measures are adopted.

2. Anu Ramaswami and Amerasainghe, "Wastewater treatment and reuse in urban agriculture: exploring the food, energy, water, and health". Paper published in the year of 2017. The study has a certain focus and limited scope on the case of direct wastewater reuse in urban agriculture in a developing city that has a mix of sewered and unsewered wastewater systems, exploring environmental benefits and presumed health benefits to urban agriculture. The study is among the first to quantitatively assess the linkages among water-wastewater reuse,

energy, and urban agriculture in a developing world context. This case study reveals key leverage points and constraints, and develops a method for evaluating impacts at the nexus of water-energy wastewater and food systems. These are significant findings needed to operationalize resource efficiency and health benefits at the food–energy–wastewater nexus in rapidly-developing cities.

3. Mazhar Iqbal and Saima Nauman, "Treatment of Wastewater for Agricultural Applications in Regions of Water Scarcity". Paper published in the year of 2021. This study was conducted to investigate the use of wastewater for agricultural and irrigational purposes. In recent decades, sewage generated by domestic, industrial, and commercial sources has dramatically increased. The lack of availability of clean water, especially or arid countries, is a significant concern for farmers, agricultural scientists, and government agencies. The reclamation of wastewater to make it suitable for irrigation has decreased the wastewater disposal issues and has decreased the wastewater disposal issues and has decreased the wastewater disposal issues and has also reduced water scarcity problems. Before its application in agricultural fields, the treatment of wastewater is mandatory to make it suitable for humans and the environment in the current trends of exploding population density and changing climate. The contents of this study can be applied in irrigation.

4. M.L Dotaniya and V.D Meena, " Use of wastewater for Sustainable Agriculture".Paper published in the year of 2019.In this study they have concluded Decreasing the availability of fresh water for agriculture crop production is widening with the time period. The increasing population demanding more food and fresh water; which solely depended on limited natural resources. So, use of WW is a common practice in peri-urban areas for agricultural crop production especially vegetable production. These WW supply plant nutrients in higher amount as well as trace toxic metals. Plant nutrients enhanced crop yield, but other side heavy metals reduced the crop quality and soil health. Long term use of WW for crop production reduced the soil biodiversity and sustainable crop yield. Use of sewage water in water scarce areas; can be profitable for growing non-edible food, fiber and oil crop like flowers, castor and jatropha crops. Apart from these, proper treatment of sewage water (through STP) prior to use in agricultural purpose, regular monitoring of sewage irrigated fields, public awareness through mass communication is needed for sustainable use of sewage water.

5. Maria Fernanda and Ines respetro, Paper "Wastewater Reuse in Agriculture: A Review about Its Limitations and Benefits". Paper published in the year of 2017. In this study they have concluded Globally, agriculture is a major consumer of wastewater. The search for alternative irrigation sources is believed to be vital to ensure food safety and to preserve natural water bodies. The safe use of wastewater, as an alternative source of irrigation, is an acknowledged strategy for the efficient use and prevention of water pollution that is gaining increasing relevance worldwide, especially in countries confronted with water shortages. However, there are risks associated with this type of use that must be assessed against a local framework, considering soil as a receiving environment and ensuring pollution will not be transferred from one medium to another (water to soil). Country efforts should be targeted at quantitative risk assessments. This would allow a more optimal and prioritized management considering that agricultural reuse can cause a very real public health problem if the risk is not taken into account

III. OBJECTIVES

- Use of treated waste water for agriculture purposes.
- Use of treated waste water for domestic purposes..
- To asses the review of health implications after the use of treated waste water in agriculture.
- To study the different properties of the collected waste water sample such as acidity, alkalinity, turbidity, hardness, Bod, Cod, Do, etc.

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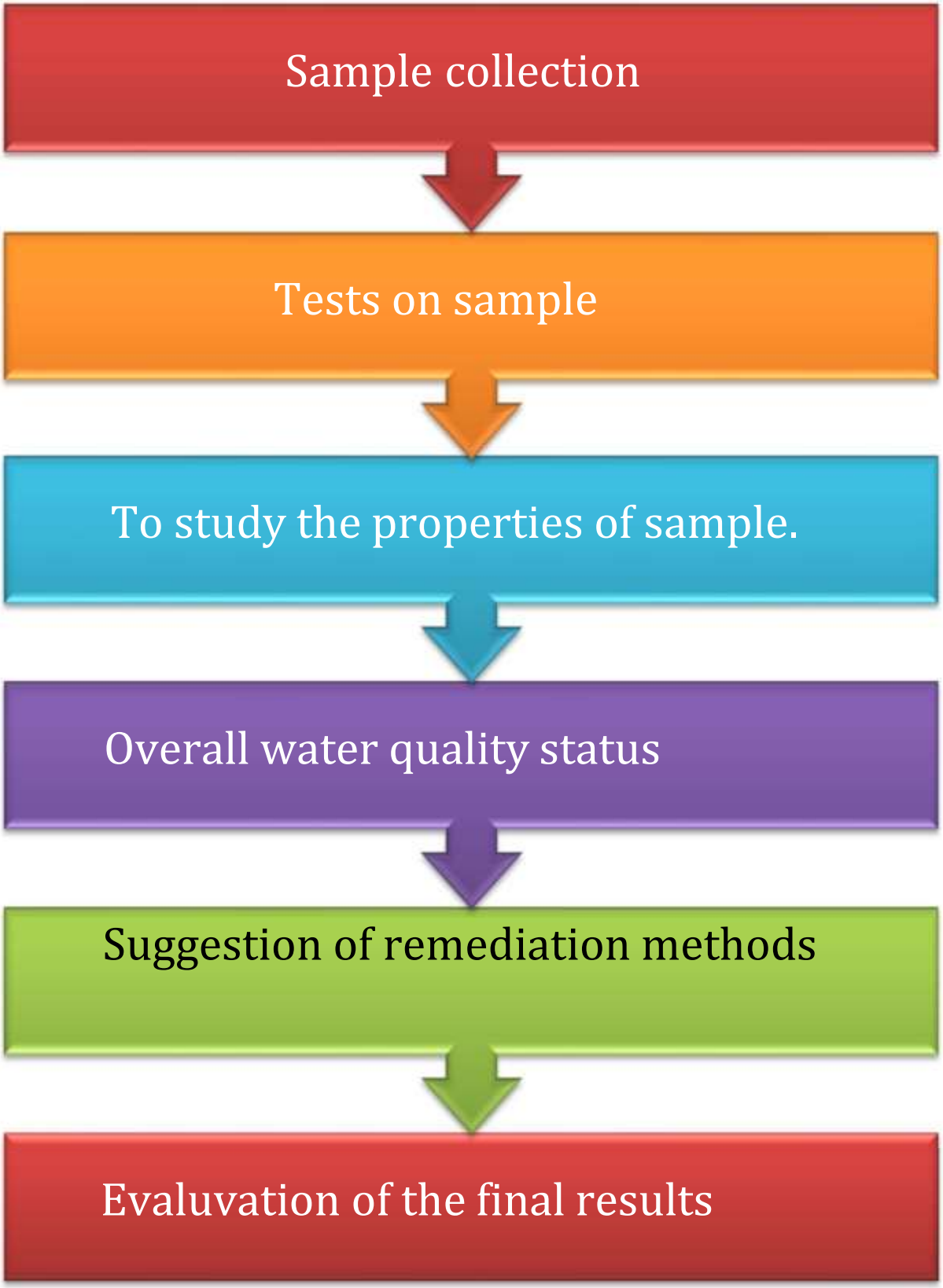
IV. FLOW CHART



V. TESTS ON WATER

- PH
- ELECTRICAL CONDUCTIVITY

- CHLORIDES
- HARDNESS
- TURBIDITY
- TEMPERATURE
- ALKALINITY
- ACIDITY
- TOTAL DISSOLVED SOLIDS
- SULPHATES
- DISSOLVED OXYGEN
- BIO-CHEMICAL OXYGEN DEMAND
- CHEMICAL OXYGEN DEMAND
- NITRATES
- SODIUM
- POTASSIUM
- IRON etc……

VI. CONCLUSION

As Availibity of the water is limited and demand far exceeds the available suply due to the increasing population amd industrialization , so treatment of waste water is nesecssary. And this treated waste water further can be used for agricultural and domestic purposes. And assessing this treated waste water in terms of agriculture productivity and review of health implications after the use of treated waste water.

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