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WATER FILTERATION USING THE COCONUT SHELL AND NEEM LEAF

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Abstract:
Due to the demand for high-quality water in people's daily lives, water quality has currently become a serious issue. There are numerous ways to enhance water. As more than a billion people on earth, in rural area water purification technologies have developed over the past few centuries to preserve public health. No one on this planet has access to pathogen-free, safe drinking water. India is among inhabited nations in the world where the poor cannot afford a portable, clean water source quality. Surface water is treated using a set of filters made of local materials. The effectiveness of single media and dual media was examined in the study of media to eliminate turbidity, color, and germs.

Along to minimize this problem there are permanent solution needed. But now days in rural areas its big issue to purifying drinking water with simple technics. Also, government have an over burden of this issue. The government gives efforts for water purification scheme in rural areas. But such scheme includes the modern technics of water purification like a water treatment plant [WTP], or online pressure filter. Such modern technics government gives initial funds but after implementation of such technics there have a some frequently maintenance required. For this maintenance government cannot having suitable funds. That's reason this all maintenance cost bear by the local government bodies like gram panchayat. But those bodies cannot have suitable income for implement of scheme in future, so such schemes are discontinued and a person drinks the contaminated water. Its big issue for their health so now days it's important to develop the convenient and budget friendly technic for purification of drinking water.

Due to this reason we are develop the water purification filter with the help of coconut shell and neem, in very pocket friendly budget

Keywords: Filter Bed,Wate Water, Coconut Shell.

I. INTRODUCTION

Domestic waste water is also discharged straight into the river krishna, together with the effluent from all distilleries, the dairy industry, the production of vegetable oil, and other enterprises. Rivers get liquid waste products from industries. Our agricultural method that makes use of chemicals as rainwater drains these chemicals, fertilizers and pesticides also contribute to river contamination. The rivers, into throwing household rubbish into rivers increases pollution. As the population rises, so do towns and cities. According

to studies, domestic almost all of the rivers in India have been contaminated by industrial effluent and agricultural trash. Majority of these rivers now serve as sewage drainage systems.

Along to minimize this problem there are permanent solution needed. But now days in rural areas its big issue to purifying drinking water with simple technics. Also, government have an over burden of this issue. The government gives efforts for water purification scheme in rural areas. But such scheme includes the modern technics of water purification like a water treatment plant [WTP], or online pressure filter. Such modern technics government gives initial funds but after implementation of such technics there have a some frequently maintenance required. For this maintenance government cannot having suitable funds. That's reason this all maintenance cost bear by the local government bodies like gram panchayat. But those bodies cannot have suitable income for implement of scheme in future, so such schemes are discontinued and peoples drink the contaminated water. Its big issue for their health so now days it's important to develop the convenient and budget friendly technic for purification of drinking water.

For this project we can collect the samples of village Koparde Haveli located near Krishna river bank. The Koparde Haveli village is near to the town Karad located at same river bank. Due to that reason the river water is polluted, so need to purify this water. In Koparde Haveli village having jack well in river bank for pull out raw water for all purpose including drinking water. We can collect the sample of that water and carry out some is code-based test in lab of our college. After those records all readings of raw water test. Along some days we can design the filter and create the model of filter. After that we can filtrate the raw water in filter and then test it in lab and going to conclusion this water is safer for drinking purpose

Polluted impure water significant health issue because millions of people still rely on this contaminated river water. The importance of purification of water is important to reduce the risk of contamination from storm water recharge and avoid different diseases. Therefore, the central and state governments are making efforts to provide adequate and safe drinking water to society by building water treatment plants in India. In India, rapid sand filters are mainly used to remove suspended and colloidal particles. The water particles remove during filtration at faster speed by setting different settings layers of sand to build it. Using sand filters as a technique is considered inexpensive and commonly used to remove contaminants from water and treat wastewater in industries. The filtration process undergoes degradation in the early and final stages, affecting the filtrate quality after counter current washing. In addition, using coconut shells in filtering has a double effect media during filtration. Design of "multi-media filter covered with crushed coconut shells and neem leaves'' appear to be more effective, economical and durable. It improves filtration performance in terms of high filtration rate, increased filter activity, significantly reduced requires backwashing, removes high turbidity and thus makes it more applicable for consumption and other uses. Slow sand filter or fast sand filter or local use materials used as filter media are considered an interesting alternative for drinking water production. They rarely have qualified technicians' available efficient operation of conventional rapid coagulation sand filters. Availability of land, labour, local materials, no need for chemicals and climatic conditions. It advocates the use of slow sand filters, which would be an inexpensive surface treatment method.

II. LITERATURE REVIEW

Guyer (2009) reported the use of geotextiles in pavements and drainage applications. This study shows that geotextiles are effective than conventional covering materials due to reduced height area. Permeable materials concentrate runoff and reduce drainage efficiency. Pipe covers can be helpful when the filter media has finer particles most suitable due to availability and particle size requirements. In this case, the geotextile

has the function of shielding the holes in the pipeline prevent dike penetration. If the geotextile can separate a little distance from the pipe surface, the flow through the geotextile enters opening the pipe will be much more effective. Using corrugated plastic, perforated tube has a hole in the concave part of the folds a simple way to do this.

Kalinovich et al. (2008) applied of geotextiles and granular filter for the treatment of PCBs (polychlorinated biphenyls). The application of surface reactive and permeable barriers has been carried out at a remote location in the Canadian Arctic for land reclamation and PCB contaminated water. The initial barrier system was installed at July 2003. Proposed preliminary field and laboratory work that geotextiles alone may not be enough for this particular Arctic barrier system, due to problems related to survivability (especially the effects of high UV and freeze-thaw) and clogging. Later field and laboratory work demonstrated that granular materials retain the majority of PCB-contaminated soils without compromising hydraulic performance; However, the fine has escaped. Extensive laboratory column testing has shown that nonwoven geotextile filters can be successfully applied with a granular permeable reactive barrier system.

Gidde et al. (2008) conducted research on betonies clay removing turbidity with herbal coagulants rural water treatment technology. Unlike cities where there is a sizable population that uses water purifiers, water guards; the rural population grows thanks to polluted water sources due to lack of financial resources and other urgent needs of life. So, it's important by putting more emphasis on strengthening source of drinking water, efforts should also be made simultaneously to ensure its quality. In rural contexts, the availability of equipment used in Its purification and acceptability are environmentally safe assured. This applied research project shows that cloudy water is possible treated to the same extent as imported and used chemicals natural substances can be purchased locally from villagers. Moringaoleifera - alum blend has proven to be a good substitute for alum, clear in addition to being a natural product, it is readily available and has a high price effective. Benefits are observed by introducing Moliere seeds. Primary coagulants and coagulation adjuvants have the potential for use in coagulates turbid water with a high turbidity removal rate, from 89 to 99%. Combined use of Moringa oleifera with alum has been shown to save between 40 and 60 D44 alum.

Lee et al. (2007) highlight the disadvantage conventional processes combine sedimentation and filtration as the residence time is quite long. This is mainly due to flocculation and settling period usually 2 hours. Fiber filters are developed for tertiary treatment of biologically treated wastewater has been used in researched on filtration for drinking water production and has been tested. Fiber a filter with inline coagulation function was used instead for the process flocculation and sedimentation. The newly designed filter is estimated using multiple filter speed 60 to 100 m/h and a small amount of coagulant (1 to 3 mg/L) online injection. Through these experiments, it has been proven that fiber filter design is very effective in removing particles during filtration speed of 60 m/h (1500 m3/d) and dosage of 1 mg/L coagulant, and these are considered optimal operating conditions.

Mahvi et al. (2007) evaluated total coliform removal and turbidity water in a continuous sand filter. Continuous filters are one type and filter, will operate without interruption during backwashing and it also accepts high levels of suspended solids in the material stream. Dirty sand is continuously removed from the filter bed, washed and recycled No interruption to the filtration process. Different water samples are available quantity of turbidity enters through the water supply pipe and is delivered to the filter. A central column extends from top to bottom of the 1000 m3/day pilot plant built with large-scale water treatment plants have been used for this purpose. Four levels sand material depending on the grain size and thickness used. This research results in either a reduction in the number of filters or an increase in the number of

settings capacities is at least doubled. Economic income is earned 15 thanks to reducing the disinfection dose as well as reducing the amount of filter sand material. Filter run time increased by 2-3 times, shown higher yield of water supplied and less quantity given backwashing is required. Above all, the water produced is of very good quality. Meets the most demanding requirements and enhances health limit sand filters have been proven to perform well under a variety of operating conditions turbidity and filtration rate of the branch stream.

Ong-Yeon Cho (2005) conducted a study on iron removal using an aerated granular filter. Laboratory-scale experiments involving iron remove artificial raw water by artificial filter using anthracite coal as a medium Filter media has been made. The main conclusion is the oxidation of iron and removal by aeration filters is mainly a catalytic chemical reaction rather than a biological response. Additionally, iron removal has no effect. Effectively without ventilation. Iron removal is very effective at pH mildly acidic. Iron oxide adhered to the surface of the support is identified as ferrihydrite, catalyses iron oxidation as shown by Mossbauer spectroscopic analysis twelfth filtered. Water is directed through an external pipe into the column by a foot radial distribution arm. Polluted water flows upwards and bed. The water raises cleanliness in the upper part of the tank, and finally, it overflows the spillway and seeps into the drainage pipe. In this research, continuous sand filters were studied to determine effective disinfection besides removing turbidity. The results show the filtered water is of high quality and the turbidity is reduced 95.5%. Filter operation test shows removal the coliform and microbial colony rates were 99.67% and 98.99 D44 respectively.

Gupta et al. (2005) evaluated the Monte Carlo water treatment plant simulation (MCS). This article develops and presents the method Assessing water treatment plant (WTP) reliability using Monte Carlo techniques to simulate desired wastewater quality. WTP is designed optimization based on nominal values of input and model variables parameters (i.e. bulk density, water viscosity and clarifier). This approach has been applied and illustrated for one 50,000 m3/day. Conventional wastewater treatment plants treat raw water containing suspended solids concentration 200 mg/l. The reliability of this mill has been proven 95.24 has been calculated on parameters using 5000 MCS tests and therefore not reaching the desired water quality standards by 4.76% due to the uncertainty of the variables.

Vitaly et al. (2005) studied the removal of cryptosporidium pharmacists by rapid sand filtration with flocculation filtration on ballast and intermediate wash. This study demonstrated that the addition of ballast the seeds systematically reduce the frequency and duration of ripening sequence is based on the hypothesis that kaolin is partially positively charged particles can adsorb on the surface. Parvum follicles and neutralization 17 their negative charges. The proposed concept was successfully developed in a weighted flocculation filtration technique is used to improve removal of inorganic particles and parvum follicle.

Going through the available literature it was understood various method & parameter are required for characterization of the drinking water. Various types of water of water filter, removal of dissolved minerals and treatment plant. Drinking water included changes in physical properties such as pH, colour, turbidity etc. Its removal is a chaotic process & therefore dissolution minerals evaluate. The filtration efficiency or effectiveness of any filter.

III OBJECTIVES OF INVESTIGATION

- To conduct a field survey and analyses the current water treatment facility.
- Evaluating the water quality and the level of contamination based on experimental investigation.
- Designing and Constructing in RSF for Household
- Analyzing Water Quality Parameters of RSF

IV METHODOLOGY

The study aims to investigate the effectiveness of background filtration as water treatment method with a focus on its application in specific study area. The research objective has been carefully to achieve.The study of selected for this research is a region with significant water quality challenges characterized by the levels of turbidity, pH data collection for this study will involve gathering water samples from various sources within the chosen study area. These sample will be subject to rig ours laboratory analysis to determine. The initial water quality parameters. These experiments will involve the design and construction of filtration system tailored to the study area's conditions using appropriate materials a configuration. Costing is a critical aspect of this research as it will provide insights into the economic feasibility and sustainability of implementing background filtration in the chose study area

a) Study Area:

For this project we can collect the samples of village Koparde Haveli located near Krishna river bank. The Koparde Haveli village is near to the town Karad located at same river bank. Due to that reason the river water is polluted, so need to purify this water. In Koparde Haveli village having jack well in river bank for pull out raw water for all purpose including drinking water. We can collect the sample. But as per discuss in introduction part now days in rural areas its big issue to purifying drinking water with simple technics. Also, government have an over burden of this issue. The government gives efforts for water purification scheme in rural areas. But such scheme includes the modern technics of water purification like a water treatment plant [WTP], or online pressure filter. Such modern technics government gives initial funds but after implementation of such technics there have a some frequently maintenance required. For this maintenance government cannot having suitable funds. That’s reason this all maintenance cost bear by the local government bodies like gram panchayat. But those bodies cannot have suitable income for implement of scheme in future, so such schemes are discontinued and peoples drink the contaminated water.Like above problem Koparde Haveli village can suffers same things. The village has a water treatment plant but this plant can’t work properly. The village is just located 10 km from town center of Karad. Therefore, so many people stay in the village and population of village is gradually increased. But the drinking water facilities can’t develop as per increasing population. There have a so many farmers and other peoples staying in village but there has a problem of availability of pure drinking water. Along our filter we can efforts for eliminate that problem in budget friendly nature.

b) Survey: As Per Visited Koparde Haveli Village Following Data Collected. On the 12th of December 2022, at 02:19 PM, a significant field visit was conducted in the village of Koparde Haveli, nestled in the heart of the Indian state of Maharashtra. This village is situated within the Satara district, specifically in the Taluka of Karad, approximately 10 kilometers from its more prominent neighbor, Karad. The geographic coordinates place Koparde Haveli at a latitude of 17.33ºN and a longitude of 74.18ºE making it a pivotal point for this study.The primary focus of this visit was to examine the village's water source, which predominantly relies on the Krishna river. This surface source originates from the picturesque hills of Mahabaleshwar, also within Maharashtra, before meandering its way through the Satara district and eventually reaching Koparde Haveli. As of the 2011 census, the village was home to a population of around 6,000 individuals, signifying the crucial role played by the Krishna river in sustaining the livelihoods and daily activities of its residents.

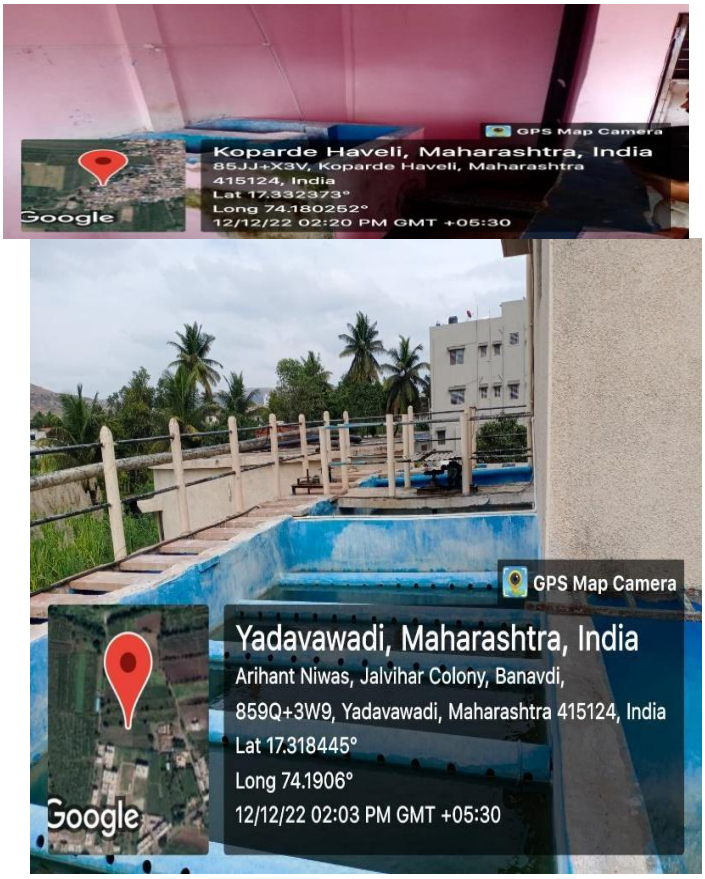
c) Visit to Water Treatment Plant Koparde Haveli:

1. Aeration : This aeration helps to remove gas and odour and mix oxygen in waterThis on-site exploration serves as a valuable starting point for a more comprehensive study on water resource management, quality, and sustainability within this region. It lays the foundation for future research endeavors aimed at safeguarding the invaluable water resources that flow through the heart of Maharashtra and nurturing the well-being of the people of Koparde Haveli and beyond. Other components in water supply system as follows.

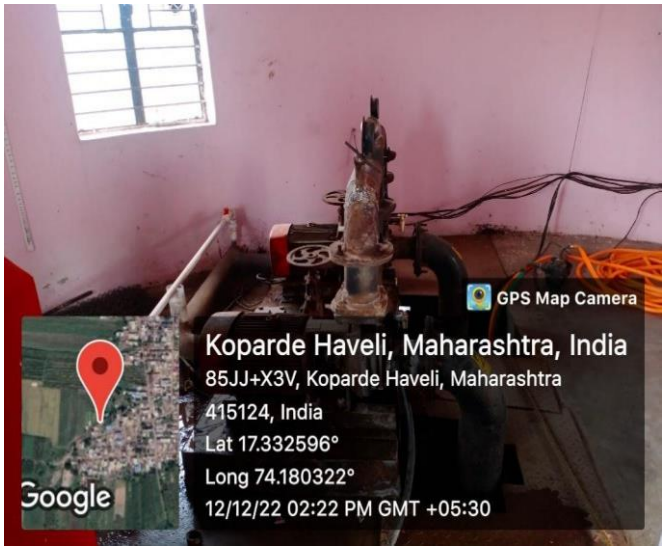
2. Flocculator : In this stage some disinfectant and PAC powder mix in water.

3. Filtration Media: In this stage water comes in the filtration beds through tube settler. In this stage water can passes by filter bed consist of sand gravels of various sizes

4.Disinfection Stage: In this stage TCL powder and chlorine is add for disinfection of water.



5.Storage Tank: After disinfection of water pure water collects at underground storage tank.



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