

# Economical Water Purifier Using Natural and Waste Materials

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**Abstract** - A primary intention under wastewater to eliminate the pollutants that can influence the human being as well as existing healthiness. Beneath the area heat to eject the particles, various types of poison's gas as like nitric, phosphoric and ammonium-ions, stench. In the primary study of economical water purifier construct waste and natural materials that is charcoal, zeolite, coconut shell/fibre, alum, Seashells with or without crushing, stones and corn cob. Using various test for water quality for suitable of human being bodies as well as living things and also check the PH value and turbidity of the best quality of water.

## 1. INTRODUCTION

India ranks 2<sup>nd</sup> in population and year latter it ranks first the drinking water need of the people dramatically increased but the water in India for drinking will be very poor quality and not have any proper purification in villages and small town areas. In most of area and villages used, ground water for drinking purpose by excavating boring well or traditional wells also the rivers water is used for drinking purpose, which is very un-pure, contaminated contain very harmful bacteria. India covers only 18% of world's population and 4% of water resources moreover 50% Indian people consume bad quality of water. the water will be contaminated by chemical like arsenic and fluoride contained by 1.96 million dwellings. A safe water supply is the backbone of the healthy economy, it is woefully prioritized under globally.

It is estimated that waterborne diseases have an economic burden of approximately USD 600 million a year in India according to UNICEF. Especially for drought and flood areas in some of smaller villages (villages of Ladakh, Rajasthan etc.) which is not easily have access to larger cities (Mumbai Delhi etc.)

## 2. OBJECTIVE AND SCOPE OF WORK

OBJECTIVE:

- Determine the physical characteristics and chemicals in water.
- Produce a filter from coconut husk fiber, charcoal, and zeolite, and membrane that improve quality of water.
- It is very cheap and made from easily available materials.
- To check the quality of water passing through that filter.
- To removes oil and some soaps coming from domestic waste.
- Recycling and reuse of water properly.
- The material will be not cost more for any person and easily available in villages.
- Removing of harmful bacteria.
- Necessary minerals in the water remain in the water.

## 3. LITERATURE REVIEW

3.1 Politeknik sultan Idris Shah (2018), he worked on 'Water filter manufacturing the usage of coconut husk fiber, zeolite, charcoal and membrane for rainwater harvesting'. Water great for the samples taken from five unique places is elevated after passing via the filters. There are a number of parameters which are regarded to be extended that pH, turbidity, color, organic oxygen demand, complete suspended solids, nitrate, zinc, and sulfate. From this project, it is observed that rainwater consists a quantity of chemical compounds such as zinc, nitrate, and sulfate. All samples had been harvested thru roof. There are many sources of impurities may want to be on the roof such as birds drop, materials of roof and leaves. Unclean reservoir may want to be the best location for micro organic growth. This should lead to excessive BOD reading.

3.2 Giridhar V S S Mittapalli (2016), he also study conducted on the " Use of Alum for Turbidity Removal

*in Synthetic Water*" In this the effectiveness of alum used to be evaluated at room temperature with initial pH (6-7.4). Turbidity is a principle physical characteristic of water. It is brought about by suspended issue or polluting influences.

Impedance with the lucidity of the water. These polluting influences may incorporate earth, sediment, finely isolated inorganic and natural issue, solvent hued natural mixes, tiny fish, and other minuscule creatures. Unreasonable turbidity in drinking water is tastefully unappealing and may likewise speak to a wellbeing concern. Turbid waters, contained colloidal particles, are normally treated by coagulation-flocculation followed by clarification.

3.3 Maxim Tyulenev (2016), he likewise directed an examination on 'Coal makers squander water sanitization' The investigation of reliance gave in designs has indicated that the difference in oil items concentration C from filtering path L with high accuracy (R2 is not lower than 0.91) is approximated by expression:-  $C = C_0 \cdot e^{-0.016L}$  where, C<sub>0</sub> - initial concentration of oil products in the waste waters discharged for purification, L - filtering path.

3.4 Shilpa S. Ratnoji (2014), conducted a study on 'a study of coconut shell-activated carbon for filtration and its comparison with sand filtration'. For conducting the pilot scale study of filtration different grades of CS-AC VIZ WT D816, WTE830 and WTE124 depending upon their sizes were produced from Indo German Carbons Limited, Kerala. These CSAC were of size 8\*16 US mesh size (I, coarser), 8\*30 US mesh size (II, medium), and 12\*40 US mesh size (III, finer). CS-Ac were maintained at a depth of 4cm in the column. Considerable pollution of natural waters brings about a situation where meeting the growing requirements for drinking water and domestic water is not possible in many plants using traditional technological systems. It can be predicted that the river water quality will not remain same in the futures.

3.5 Karmen Margeta (2013), yet as he additionally conducted a study on 'Natural Zeolites in water treatment - however effective is their Use' he work represented was partly supported by the Ministry of Science, Education and Sports of the Republic of Republic Croatia through the bilateral project. The distinctive natural process and surface assimilation

properties, high consistence and glorious thermal stability of Zeolites create then terribly appropriate for several applications, additionally in water treatment processes.

#### 4. METHODOLOGY

The aim of this study is to investigate and to reach the optimum efficiency of using economical water purifier using natural and waste materials, by testing in the laboratory the quality of effluent of a filtrated bore, river, well, washing and vegetation water samples at different depths of the filter media and by investigating the efficiency of purification. The study considers two parameters; physical parameter (i.e. suspended solids) and biological parameter (i.e. fecal coliforms).

##### 4.1 EXPERIMENTAL DESCRIPTION

###### 4.1.1 Step 1.

- Consider five bottles having a volume of 1 lit, upper part of these bottles are cut in such a way that to form a cylindrical shape.
- These bottles having one side is open and another side is closed, on the closed part of the bottle, hole is made to see as the net.
- These five bottles are named as A, B, C, D and E.
- Height of this cut bottles should be 20 cm and the diameter are 7.5 cm.

##### SPECIFICATION OF MATERIAL:

Cotton - The cotton ball layer assists with keeping different layers of your channel from dropping out into your water.

Coconut husk - Coconut husk have been shown throughout recent history to be extremely effective for removing contaminants, tastes, and odors from drinking water. Carbon from coconut husk have a higher volume of micropores for filtration than coal, wood, or carbon based on lignite.

Fine charcoal – Charcoal is utilized to eliminate contaminants and polluting influences, utilizing concoction adsorption dynamic charcoal carbon channels are best at eliminating chlorine, silt, unpredictable natural mixes (VOCs), taste and smell form water.

Fine sand - Sand filtration is used for the removal of suspended matter, as well as floating and sinkable particles.

Fine aggregate – fine aggregate is used for the removal of suspended matter, as well as floating and sinkable particles with faster rate.

Coarse aggregate - Coarse aggregate is used for the removal of large, suspended matter, as well as floating and sinkable particles with faster rate.

Cotton cloth - Cotton filter cloth is used for purifying liquids like oil and water to remove dust and dirt from them. They are utilized for separating soil and residue from fluids like water and oil. Among many types of filter cloths available on the market, cotton is often preferred for it's cost-effective.

Seashell - A seashell as bio-filter used in Wastewater Treatment.

The predominant odorous compounds found were hydrogen sulphide, methyl mercaptan, and dimethyl sulphide. These mixes successfully eliminated by the bio-channel at more noteworthy than 99% evacuation effectiveness in that decreasing the compound focuses to underneath their smell edges.

The nonpartisanship of the recycling water was variable relying upon conditions in the bio-channel, yet a neighborhood unbiased PH was found in the shells themselves. All measurements performed suggest that this seashell bio-filter is successful at removing odours found at Lake Wildwood.

Shells are a calcium rich asset that can be utilized to deliver calcium oxide (lime). This lime can be utilized in a few unique manners in ecological advances, and our examination has indicated that the hydroxyapatite framed from them is a compelling. Green and conceivably cost-productive option photo catalyst for wastewater treatment.

Charcoal - charcoal carbon filters are most effective at removing chlorine, particles such as sediment, volatile organic compounds (VOCs), taste and odor. They are not powerful at eliminating minerals, salts, and broke up inorganic substances.

Coco peat - Coco peat is a waste product generated when coco coir (fibrous material) is removed from

coconut husks. Coco peat is used as low-cost filter medium.

Sugar cane husk - Iron and manganese are commonly present in groundwater supplies used by many water systems. The presence of iron and manganese in the drinking water is not harmful to human bodies. Be that as it may, higher focus causes staining, re-coloring, turbidity, and awful taste issues. It additionally structure iron oxide or manganese dioxide gatherings in pipes.

In the current work, ease strategies have been advanced for the expulsion of iron and manganese from ground water utilizing Rice Husk based Activated Carbon (RHAC) and Sugarcane Baggase based Activated Carbon (SBAC).

Pebble- Sand and pebble filters are able to trap particles within the water through physical means alone.

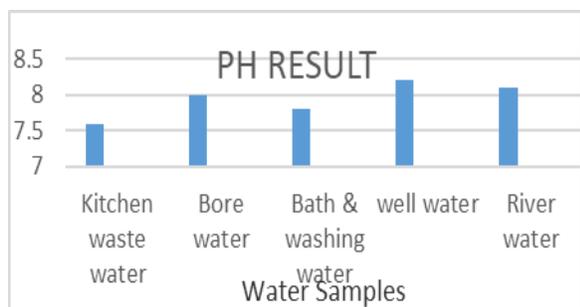
Gravel - Sand and gravel filters are able to trap particles within the water through physical means alone.



5. RESULT AND ANALYSIS:

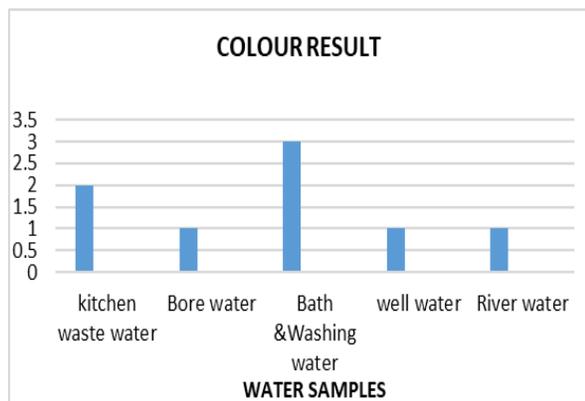
PH RESULT

SR. NO	WATER SAMPLES	PH RESULT
1	Kitchen wastewater	7.6
2	Bore Water	8.0
3	Bath and Washing water	7.8
4	Well Water	8.2
5	River Water	8.1



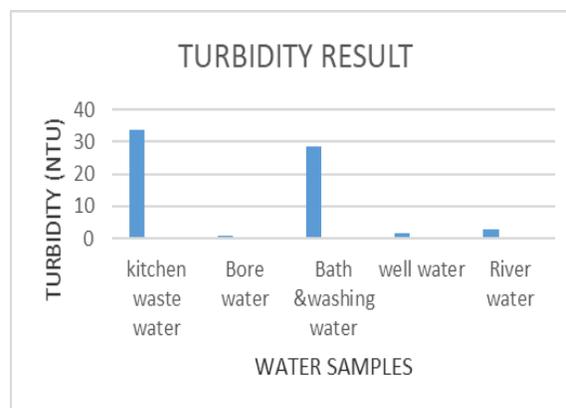
COLOUR RESULT

SR. NO	WATER SAMPLES	COLOR RESULT
1	Kitchen wastewater	2
2	Bore water	1
3	Bath & washing water	3
4	Well water	1
5	River water	1



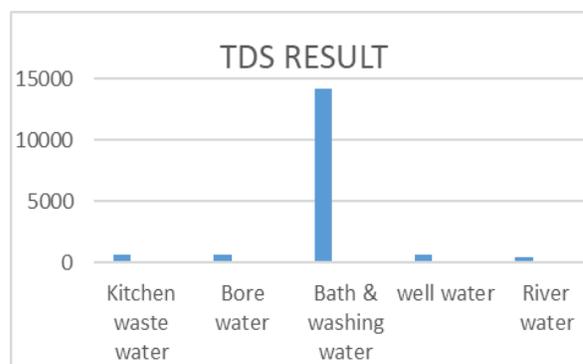
TURBIDITY RESULT

SR. NO	WATER SAMPLES	TRBIDITY RESULT (NTU)
1	Kitchen Wastewater	33.6
2	Bore water	0.8
3	Bath and Washing Water	28.4
4	Well water	1.4
5	River water	2.8



TDS RESULT

SR. NO	WATER SAMPLES	TDS In (MG/L)
1	Kitchen wastewater	620
2	Bore water	572
3	Bath and Washing water	14220
4	Well water	660
5	River water	382



ODOUR RESULT

SR. NO	WATER SAMPLES	Odour result
1	Kitchen wastewater	Disagreeable
2	Bore water	Agreeable
3	Bath and Washing water	Disagreeable
4	Well water	Agreeable
5	River water	Agreeable

6. CONCLUSION

The water quality for samples which is taken from five different places which is improve after passing through the filters which having various waste and natural materials This water is taken from five places i.e. Bore, well, River, Kitchen water, household water.

By many researches, it is found that the different places and also rainwater consists a number of chemical compounds like zinc sulfate and nitrate etc. The different places water contains impurities presence in water which harvesting method itself all the water harvested through land, roof, river, dam, and reservoir.

There are many impurities should be present in reservoir because it is disposed open to environment and various dispose in reservoir leaves vegetation, Industry waste, washing water by soups etc. is present.

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