CONFERENCE PROCEEDING

Flood Water Filtration and Purification System

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ABSTRACT

A flood is a disaster that happens unexpectedly and causes death, devastation of property or the environment, as well as having an impact on local community activities. This crisis calls for intensive management of resources, frequency, and people from numerous agencies as well as efficient coordination and the necessary actions. Contamination of water facilities is the most frequent concern connected to flooding. Due to the mudslides produced by the rains, the water becomes murky and stinky. This water source is no longer usable as a source of water for daily tasks. In order to help those in need of clean water during a disaster, this study was carried out. Empty bottles, eggshells, coconut coir, and river stones are examples of recycled and environmentally acceptable products that can be used to reduce solid waste. Due to the exceedingly alarming daily discharge rate of these materials, we used it to protect the environment and live sustainably. The process starts with adding the tainted water to the large bottle. The water will then pass through the filter part, which is made of four layers. The first layer is coconut coir which has a high porosity due to its fibre nature. The second layer is charcoal which is excellent for absorbing oil because it contains activated carbon. The next layer is pebbles, which can filter out coarse solutions. The last layer is eggshell, which is rich in calcium carbonate and can filter out radioactive materials. As a result, the water that is released from the bottle will be neutral and suitable for use in everyday tasks. This demonstrates that this study can continue to revolutionise not only in this nation but also in other countries due to its low price and environmentally friendly. In terms of the study's findings, we hope that it will serve as an incentive for helping individuals to deal with this issue when a crisis arises.

Keywords: *flood, clean water, filter, eco-friendly*

INTRODUCTION

The increasing frequency and severity of flooding events around the world pose significant challenges, not only in terms of immediate human safety but also in managing the consequences (Crawford et al., 2021). One of the most critical concerns during and after a flood is access to clean and safe drinking water (Shokri et al., 2020). Traditional methods of water purification often rely on energy-intensive processes or chemical treatments that may have adverse environmental impacts (Shannon et al., 2008). In response to these challenges, a new approach of floodwater purification and filtration systems is emerging, centered around the use of eco-friendly materials and sustainable technologies.

Eco-friendly flood water filtration system offers a paradigm shift in disaster relief efforts. This innovative system aims to provide access to potable water while minimizing harm to the environment. By leveraging sustainable and biodegradable

materials, these solutions not only address the immediate need for clean water but also contribute to long-term environmental resilience.

In this paper, we will explore the concept of floodwater purification and filtration systems that prioritize eco-friendly materials and sustainable technologies. We will explore the benefits and principles behind such systems, highlighting their potential to lighten the impacts of flooding while minimizing harm to the natural world. This new approach not only offers a salvation in times of crisis but also aligns with broader goals of environmental conservation and sustainability.

MATERIALS AND METHODS

The materials utilised in this filter are primarily recyclable, including discarded bottles, eggshells, coconut coir, and river stones. By combining all of these materials, we can help to reduce the waste that we generate every day and convert it into a beneficial water filter. This method also assists people who need clean and clear water. During the filtration, each of these constituents will exert their unique influence. First and foremost, we used coconut coir for the first layer of the filter since it contains micropores and macropores and can absorb all the oil from the filthy dirty water. As a result, the water that comes out is clearer and devoid of oil. In addition, we used another material in our filtration system for the second layer, which is charcoal. As it includes a lot of carbon, salts, and minerals, charcoal has a lot of functions and can aid a lot in water conditions, such as getting rid of undesirable taste and odour. The pebbles were then put as the third layer. There are numerous advantages of using pebbles in filtration to filter the course solution. As a result, the water flow is smooth, and it is capable of neutralising acidic water into alkaline water due to its mineral content. Therefore, it can assist in meeting all of the body's needs on a daily basis. Later, we used crushed eggshells as adsorbing-fixing agents since they are high in calcium and aid in the removal of radioactive elements, ensuring that the water is safe for humans. As a result of extensive research and recommendation, all of these methods and developments can be trusted.

RESULTS AND DISCUSSION

The clean and clear water is successfully obtained using the system. Here we are discussing the benefits and principles behind all those materials that have been used in this system. The first layer, which is coconut coir, has several benefits when used in water filtration applications. It is a renewable resource because it is derived from coconut husks, a byproduct of coconut production. This makes it an environmentally friendly choice compared to some synthetic filtration materials. Other than that, it is biodegradable, which means it breaks down naturally over time and does not contribute to long-term environmental pollution. Coconut coir is also generally cost-effective, especially in regions where coconuts are abundant. This makes it an affordable choice for water filtration, particularly in developing countries. It also has a high porosity due to its fibre nature, and this allows for efficient water flow which is effective for filtration. Coconut coir also has natural adsorption properties, which means it can effectively remove contaminants and impurities from water (Selamat et al., 2018). It can absorb heavy metals, organic compounds, and other pollutants. Next is charcoal. Charcoal is highly effective and widely used as a medium in water

filtration and purification due to its numerous benefits. It can effectively remove a wide range of contaminants, including organic compounds, chemicals, chlorine, volatile organic compounds (VOCs), pesticides, and some heavy metals (Kearns, 2007). This adsorption process helps improve water quality. It can remove unpleasant odors and tastes from water by adsorbing compounds responsible for these issues. This is especially important for improving the taste and odor of water. It is also natural and biodegradable material and also considered environmentally friendly. Charcoal can be used for emergency water purification, as it effectively removes many contaminants, making it valuable for disaster relief efforts and also outdoor activities. On the other hand, pebbles also play an important role in the system. Pebbles are also a natural resource and are readily available in many regions. Their use in water filtration can be considered environmentally friendly and sustainable. They are typically requiring minimal maintenance. They can be easily cleaned by rinsing or backwashing, making them a low-maintenance filtration option. Besides, they have a long lifespan and do not break down easily, reducing the need for frequent replacement. Pebbles can act as a physical barrier to filter out larger particles, sediment, and debris from water. They provide a natural way to trap and remove these contaminants (Rajapakse, 1990). Therefore, pebbles are suitable as part of a multi-stage filtration system. Lastly, eggshells. Eggshells are composed mainly of calcium carbonate (Kristl, 2019). When crushed and used as a filtration medium, they can add a small amount of calcium to the filtered water. This can be beneficial for areas with calcium-deficient water, as it may contribute to improved water quality.

CONCLUSION

In conclusion, this system is able to purify water at a lower cost and with less energy. While at the same time it is minimizing the use of chemicals and impact on the environment. Based on the arrangement of elements employed, the result was clearer water. This clean water can now be used for regular activities such as washing clothing, washing faces, and many more. According to this research, these materials, which are eggshells, coconut coir, and pebbles, can be reused in a significant way to benefit the society. Hope this can help to alleviate some of the tension of flood victims or any individual who is having problems in finding clean water. From this point forward, detailed research can be conducted to support flood victims and enhance the quality of design and marketing. It can also be offered in the form of a kit for travelling, especially in places where it is hard to find clean water supply.

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