

## **Performance of coconut shell as agro-based media water filtration for stormwater**

### **ABSTRACT**

It is no secret that filtration has been extensively used for water quality enhancement. However, urbanisation and uncontrollable growth increase the possibility of pollutants entering a water body or river, particularly through stormwater runoff. Numerous studies have shown a continuous improvement in the filtration mechanism's ability by using alternative sources of material as engineered soil media, such as agricultural waste or agro-based medium. Coconut shells can potentially become one of the most successful media for water filtration. In this study, the main aim is to investigate the performance of coconut shells in removing total suspended solids (TSS) and turbidity. Coconut shell samples must be carbonised to obtain the granular applied as the media filtration. Several runs were performed with varying stormwater concentrations and loading rates and different river sand and coconut shell filter configuration mix ratios ranging from 50% to 100%. For synthetic stormwater, two concentrations were prepared using kaolin powder: 150 mg/L and 1,500 mg/L (TSS) and 123.54 NTU, and 1,235.4 NTU (turbidity). Three loading rates were applied for each configuration of the design column filter. From the results, river sand (control) was the most successful media filtration in removing TSS and turbidity, with almost 100% removal. However, the combination of river sand and coconut shell can provide an efficient and effective stormwater filtering system besides encouraging green technology for water filtration.