Zero Wasted Phragmites australis

Zayan, Aya (School: STEM School of Alexandria)

Phragmites Australis is an aggressive species that lowers plant biodiversity. The main purpose of this study is to analyze the Phragmites Australis to help poor countries be more self-sufficient. I conducted some experiments to measure the plant's biochemical quantities. After the preparation of the crude ethanolic and water extracts of the plant's stems, leaves, and roots, the antioxidant capacity and the active components were illustrated by demonstrating the spectrophotometer readings of the DPPH (2,2-DiPhenyl-1-PicrylHydrazyl) test, PMA (Phospho Molybdate Assay) test, phenolics, and flavonoids. The results ensured that the plant was full of strong antioxidants and active components as the total phenolic content was 149.1 mg/g DM and the free radical scavenging capacity (antioxidant activity) was 82.5%. Secondly, I created a filtration membrane using the Phragmites Australis and chitosan as a bioactive polymer to treat sewage water and use it in irrigation. Water analysis showed that the plant removed more than 93% of the heavy metals and 88% of the total coliform. After obtaining these results, I concluded that the Phragmites Australis can help poor countries, villages, and hamlets access clean water, clean soil, good health and well-being as it can be used to create antioxidant tablets for its high free radical scavenging capacity, and sustainable energy.