Water Integrated Desalination System using Graphene Sheets and Silver Nano Particles

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Our country "Egypt" is susceptible to droughts and could possibly run out of water by 2025. Providing new source of pure water is challenging. The solution is inspired from our natural, God-given unconsumed seawater. Advanced research is made upon previous solutions in seawater desalination. Nano-Technology seems revolutionizing and effective. Efforts are exerted to make integrated system that produces pure water. It was found that the nano pores requires water without macro bacteria that clog the bores, so pretreatment stage is made. It is BSF (Bio-Sand Filter) that can reduce bacteria, protozoa, and viruses by the percentages of 81-100% 99.98-100% and 90% respectively. After desalination stage water will be more likely to distilled water without essential minerals to human health, so post-treatment stage is made. It reinserts the minerals to maintain the TDS (total dissolved solids) around the fixed values 150-900 PPM (part per million), according to the standards of the (WHO) World Health Organization. The project in its present form produces high quality of potable water. The activated carbon in the BSF can remove odors, tastes, colors by 88.2%. The system desalinates water with 99% less energy due to hydrophilic edges of graphene sheets. Increasing the period of availability of the membrane is required, so anti-scaling stage is added to destroy the locked salt molecules. The factories that overuse and pollute fresh water can apply this integrated system. This system can be applied in the villages that suffer from water shortage or polluted water drinking to provide them healthy water.