The Usage of Moringa Seeds in Sewage Purification for Agriculture and Clean Energy Production

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Although water makes up to 71% of the Earth's surface, only 0.5% is fresh. Fresh water resources are getting exhausted at an exponential rate due to environmental changes, as well as the lack of sustainable planning. This project addresses three of the United Nations Sustainable Development Goals (UN SDGs); Clean Water and Sanitation (SDG 6), Affordable and Clean Energy (SDG 7), and Zero Hunger (SDG 2). People living in small towns or villages with no access to central services, will be the main beneficiaries of this project. The project is about developing a decentralized sewage unit for sewage purification for agricultural uses; the products are methane gas that serves as a source of energy, and agriculture fertilizers and water. The sewage bulk is filtered through a net, aerated, mixed with grinded moringa seed, and finally charcoal to remove color, taste, and odor. Moringa Oleifera (MO) is widely cultivated in Egypt; its seeds contain 35–40% oil, with potent antimicrobial activity as well as effective coagulant and heavy metal removal properties. The COD, BOD, TDS, and other bacterial count tests are carried out to ensure the suitability of the produced water for agriculture. Therefore, MO can be considered a natural and cheap alternative for chlorine and aluminum sulfate. Through this project, the sewage water treatment unit could be cost-effective and eco-friendly by sustaining the fresh drinking water and increasing the availability of agricultural water and natural safe fertilizers. This eventually leads to increasing crops production and supports the country's economy.

Awards Won:
Fourth Award of $500