Easy Water: One New Easy Handling Physico-Chemical Treatment Unit, with Microbiological Action, Powered by Solar Energy

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The Amazon region faces challenges in providing its population with drinking and treated water. In Brazil as a whole, piped water only supplies 36.1% of households. The Amazon is the region that has the largest amount of freshwater in Brazil and should give examples of sustainability in wastewater treatment. Nevertheless, indigenous and riverine communities bordering the Amazon River do not have access to potable water nor electricity and suffer health problems caused by contact with contaminated water. The goal of this project was to build a prototype to conduct chemical and microbiological physical water treatment, through a self-sustaining system (renewable energy) that could help communities in the Amazon region. In order to verify the effectiveness of the microbiological purification prototype I carried out the analysis of water quality by determining the most probable number of total and thermotolerant coliforms using the technique of multiple pipes. Measurements of the outputs of solar panels, both individually and connected in parallel, were made comparing the arrangement of the conical model with and without juxtaposed reflectors. The prototype has met the project objective and showed a capacity to treat 100 ml of water per minute, operating efficiently with self-sufficient energy in all stages and at low cost. All combinations of samples not processed in the prototype showed bacterial growth. None of the combinations of samples showed bacterial growth after being subjected to the treatment in the prototype. The optimal arrangement of solar panels increased the voltage output of each solar plate in 13.14%.

Awards Won:

Third Award of $1,000