The Effectiveness of Various Hydroelectric Turbines

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The purpose of our project was to determine which turbine between the Pelton and Kaplan was more efficient on a small scale, and determine whether or not the turbines would be efficient enough to power third world countries. So, after a lot of research and different design considerations, we began any construction, we modeled our two turbines on Autodesk Inventor, a CAD product, taking into consideration the sizes for every part needed. This allowed us to 3D print any piece that was impractical to construct out of any supplies available. After we built our turbines, we devised an efficient way to create an artificial water source. This involved a container holding 23 gallons of water, serving as our reservoir. The water would be pumped through a series of PVC pipes connected to the turbine and which is connected to the generator. After the water has run through the turbine it is forced into a bathtub for easy drainage. We captured the length of time it took to empty the reservoir at different percentages of water flow. We would then divide the gallons of water by the number of seconds the turbine was running for, then multiply that answer by 60 to obtain our gallons per minute. We had a digital multimeter connected to the generator to capture the voltage across the turbine into 2 light bulbs. After conducting our experiments and gathering data, we concluded that, on a larger scale, both of these turbines could power third-world countries.

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