
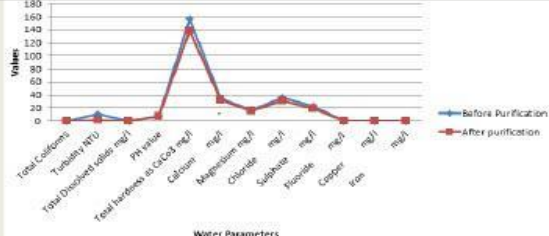


Department of Mechanical Engineering
Final Year Project Exhibition: 2023 - 2024

BATCH No.: -02																																							
PROJECT TITLE: FABRICATION OF LOW COST SOLAR POWERED PORTABLE WATER PURIFIER																																							
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ABSTRACT																																							
<p>This project aims to develop a <i>low-cost Solar Powered Portable Water Purifier tailored for army applications</i>. The purifier incorporates multiple filtration technologies including activated charcoal, UV (Ultraviolet) disinfection, hollow fibers, and mineral stones to ensure comprehensive water purification. Activated charcoal is utilized to remove impurities, odours, and organic contaminants from the water, enhancing its taste and safety. UV disinfection provides an additional layer of protection by targeting and eliminating bacteria, viruses, and other microorganisms present in the water. Hollow fiber membranes are integrated into the system to physically filter out suspended particles, sediment, and larger impurities, further enhancing water quality. Additionally, mineral stones are incorporated to infuse essential minerals into the purified water, ensuring its nutritional value. The system is designed to be portable and powered by solar energy, making it suitable for deployment in remote or off-grid locations where access to clean water is limited. The combination of these advanced filtration technologies and solar power makes the purifier efficient, sustainable, and well-suited for use by military personnel in challenging environments.</p> <p>This project not only addresses the critical need for clean water in military operations but also <i>emphasizes cost-effectiveness and environmental sustainability through the use of renewable energy sources and innovative filtration methods</i>.</p>																																							
SALIENT FEATURES																																							
<ul style="list-style-type: none"> Portable Design allowing for easy transport and deployment in various military environments. It utilizes solar energy for power, making it independent of grid electricity and suitable for off-grid or remote locations. The purifier integrates multiple filtration technologies including activated charcoal, UV disinfection, hollow fibers, and mineral stones for comprehensive water purification. Emphasizes cost-effectiveness by using affordable materials and technologies without compromising on water quality and performance. Environmental Sustainability as it incorporates renewable energy (solar power) and innovative filtration methods to promote environmental sustainability and reduce carbon footprint. Military Application as this purification system is specifically designed for army applications, addressing the critical need for <i>clean and safe drinking water in military operations and field conditions</i>. 																																							
Results																																							
 <table border="1"> <caption>Water Parameters Before and After Purification</caption> <thead> <tr> <th>Water Parameters</th> <th>Before Purification (mg/l)</th> <th>After Purification (mg/l)</th> </tr> </thead> <tbody> <tr><td>Total Calcium</td><td>~10</td><td>~10</td></tr> <tr><td>Turbidity NTU</td><td>~10</td><td>~10</td></tr> <tr><td>pH value</td><td>~7.5</td><td>~7.5</td></tr> <tr><td>Total Hardness as CaCO3 mg/l</td><td>~160</td><td>~10</td></tr> <tr><td>Calcium mg/l</td><td>~10</td><td>~10</td></tr> <tr><td>Magnesium mg/l</td><td>~10</td><td>~10</td></tr> <tr><td>Chloride mg/l</td><td>~10</td><td>~10</td></tr> <tr><td>Sulphate mg/l</td><td>~10</td><td>~10</td></tr> <tr><td>Fluoride mg/l</td><td>~10</td><td>~10</td></tr> <tr><td>Copper mg/l</td><td>~10</td><td>~10</td></tr> <tr><td>Iron mg/l</td><td>~10</td><td>~10</td></tr> </tbody> </table>				Water Parameters	Before Purification (mg/l)	After Purification (mg/l)	Total Calcium	~10	~10	Turbidity NTU	~10	~10	pH value	~7.5	~7.5	Total Hardness as CaCO3 mg/l	~160	~10	Calcium mg/l	~10	~10	Magnesium mg/l	~10	~10	Chloride mg/l	~10	~10	Sulphate mg/l	~10	~10	Fluoride mg/l	~10	~10	Copper mg/l	~10	~10	Iron mg/l	~10	~10
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