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AFFORDABLE SOLAR WATER HEATER FOR RURAL APPLICATION IN ETHIOPIA











What?

- Developed a solar water heater tailored for rural contexts in Ethiopia, acknowledging the imperative for reliable hot water in regions where conventional heating methods are scarce.

How?

- Conducted a comprehensive **needs assessment** to understand specific requirements and challenges faced by rural communities.
- Developed a cost-effective design, utilizing **locally sourced** materials and streamlining manufacturing processes.
- Integrated solar collector to optimize efficiency and harness renewable energy for water heating.
- Utilized thermal analysis & simulation to refine system performance and ensure suitability for rural conditions.
- Prioritized user-friendly maintenance features, considering the limited technical expertise prevalent in rural areas.

Results

- Simulations validated the efficiency and reliability of the solar water heater under varying environmental conditions, employing MATLAB and Simulink.
- Demonstrated that it can heat water from **22°C** up to **41°C**, showcasing practical utility.
- Attained an acceptable efficiency rate of **60%**, optimizing energy utilization for rural applications.