

The SOWAHE (Solar Water Heater)

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Abstract:

Being passionate to aid our country achieve its **industrial vision 2025**, we have come up with the **SOWAHE**, which is economical, environmental friendly and cheap to manufacture since it uses cheap materials which trap radiant heat to warm water. This water is afterwards stored in a thermos tank, which is designed in a way to minimize heat losses for use at any time.

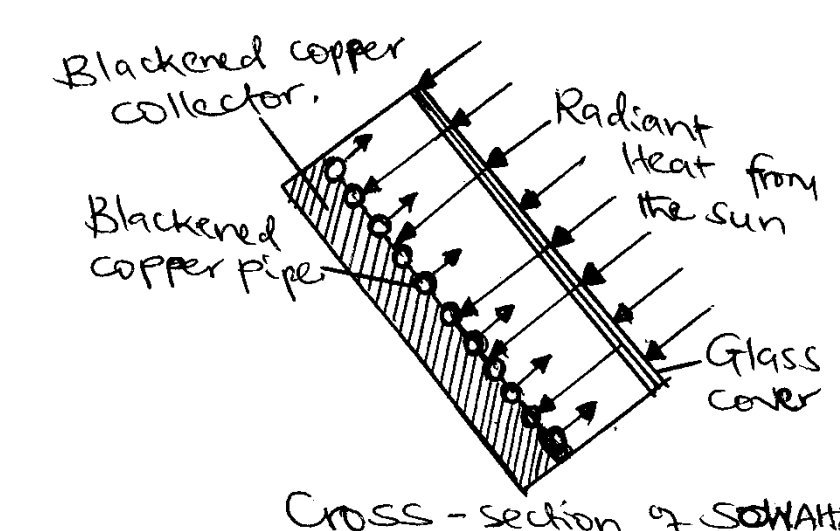
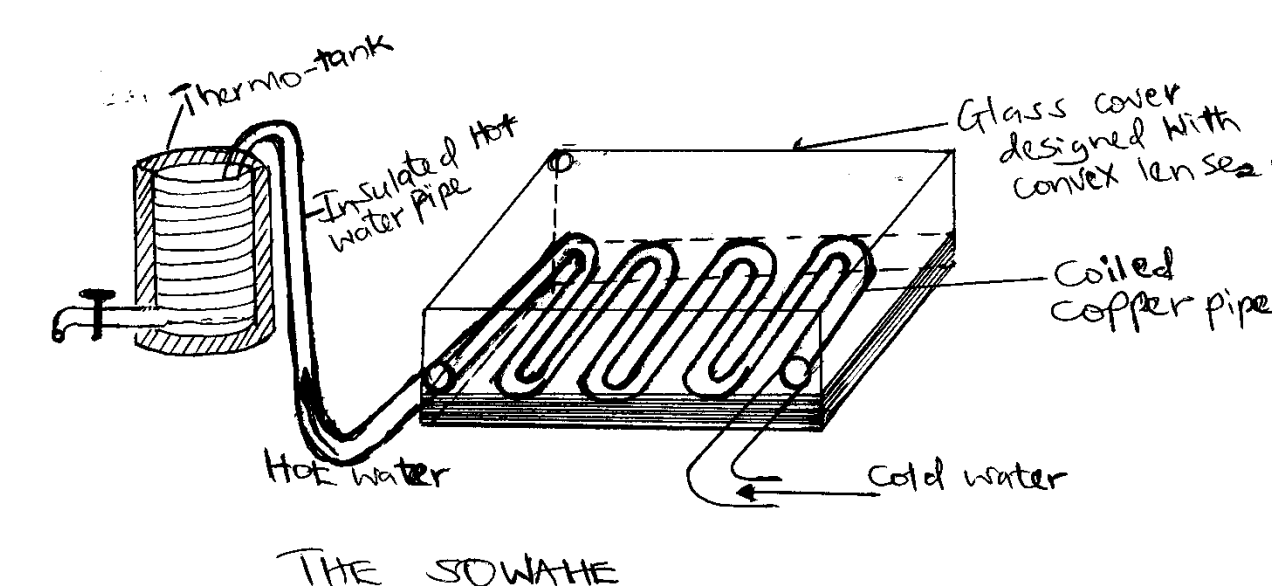
The SOWAHE will promote industrial development of our country as we yearn to attain our Tanzania development vision 2025.

Method:

Fix firmly the copper collector onto insulator and on it fix the coiled Copper pipe. Determine the focal length of the lenses to be used and fix the glass box to the height equivalent to the focal length. Fix the convex Lenses onto the glass at desirable intervals from each other. All these should be fixed to leave no gap such that no air is allowed to escape from the glass box.

The water that is made to pass through the blackened coiled copper pipe comes out warm (hot). This demonstrate that there is high concentration of radiant heat on the blackened copper materials.

This confirms that the SOWAHE is effective. The warm water that is stored in the thermo tank was able to remain warm since it is designed to minimize heat losses by conduction.



Results:

In a research that we conducted within Mwanza city whereby we focused residential homes, small scale industries, large scale industries and big hotels, the following data was collected

Less than 15% of the homes visited possessed electrical water heaters and even out of these, many could still not use because of their high rates of power consumption hence high electrical billing.

Many of the sampled big hotels, rest houses and small scale industries neither installed nor used solar water systems claiming they were very costly to install and required regular maintenance.

Therefore, the incorporation of the SOWAHE technology can help cut down electrical billing costs since it is cheaply manufactured and harnesses natural resources.

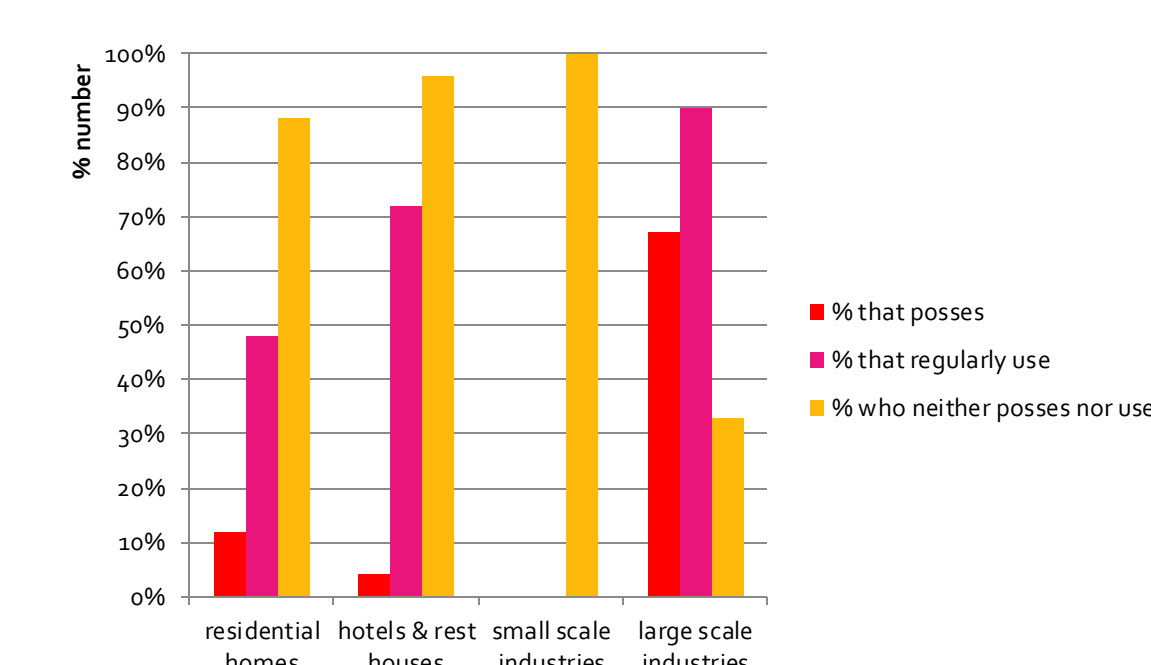
(a) The sample space.

Residential Homes	Big Hotels & rest houses	Small scale Industries	Large scale Industries
50	25	38	15

The interviews and questionnaires used, focused on the following.

- How many homes use electrical water heater?
- How many small scale industries, Hotels and large scale industries have installed solar water systems?
- What are the billing rates of power (Are they affordable) if they have electrical water heaters?
- Reasons as to why they have not installed the solar water systems in case they do not have.

	Residential Homes	Big Hotels and rest Houses	Small scale industries	Large scale industries
% number that possess	12%	4%	0.0%	67%
% number that regularly use.	48%	72%	N/A	90%
% Number who neither possess nor use because of high costs.	88%	96%	100%	33%



Conclusions:

After constructing the SOWAHE our objectives were made for it proved Effective and cost effective compared to other electrical heaters and solar water systems in the market.

The manufacturing of a small sized SOWAHE cost approximately quarter of the market value of the available heaters. Since our economic vision as a country is to attain a middle class economy by year 2025 we should encourage the utilization of natural resources and minimizing unnecessary expenses. This will boost economic development and if the SOWAHE is industrially incorporated it will create jobs and help our country to reach industrial development vision 2025.

References:

www.eco-solares.com

www.czimposol.com

Acknowledgments:

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