SOLAR STILL

GROUP MEMBERS:

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Class - 7

Introduction

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The availability of drinking water is reducing day by day; where as the requirement of drinking water is increasing rapidly. To overcome this problem there is a need for some sustainable source for the water distillation (purification).

Solar still is a useful device that can be used for the distilling of brackish water for the drinking.

The challenge facing the world electricity sector is the cost incurred in maintaining the system and seeing to the environmental effects it causes. In Mexico the grid is supplied by thermal plants fed by oil products. Its great potential of renewable energy shown in these solar stills.

Our project

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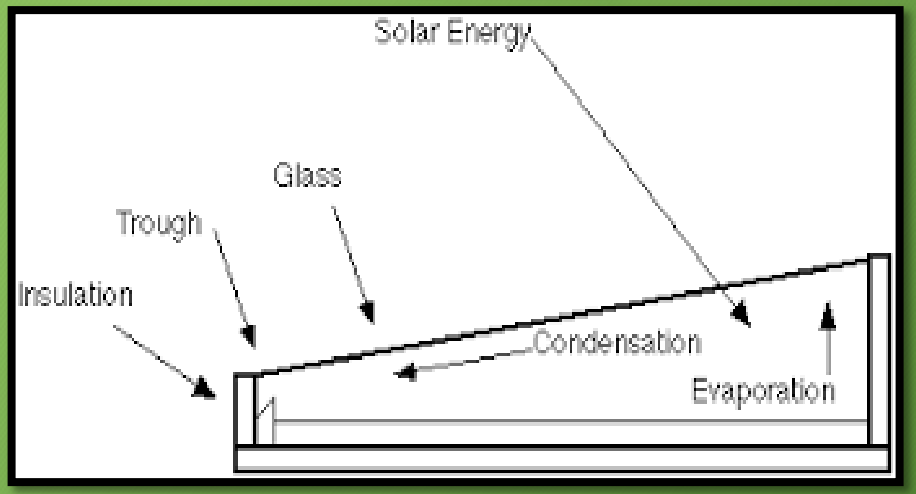
A solar still distills water, using the heat of the Sun to evaporate water so that it may be cooled and collected, thereby purifying it. They are used in areas where drinking water is unavailable, so that clean water is obtained from dirty water or from plants by exposing them to sunlight



There are many types of solar still, including large scale concentrated solar stills and condensation traps (better known as moisture traps amongst survivalists). In a solar still, impure water is contained outside the collector, where it is evaporated by sunlight shining through clear plastic or glass. The pure water vapour condenses on the cool inside surface and drips down, where it is collected and removed.

Collection of pond water and Solar still set up

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Sample collection

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DATE	TEMPERATURE IN °F	AMOUNT OF WATER COLLECTED in ml [approx.]
6.1.2019	87	100
7.1.2019	85	75
11.1.2019	89	100
18.1.2019	87	150
20.1.2019	84	75

Test Report

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Analysis	Pond water	Collected water
pH at 25^{oC}	6.91	7.3
Specific conductance at 25^{oC}	635 μmhos/cm	77 μmhos/cm
Turbidity	10.50 NTU	6.9 NTU
Colour	25 Hazen	5 Hazen
Odour	Agreeable	Agreeable
Total Hardness as $CaCO_3$	161 mg/L	26.8 mg/L
Total dissolved solids	394 mg/L	48 mg/L

Comparative Analysis

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Analysis	Distilled water	Collected water	Drinking water
pH	7	7.30	6.5-8.5
Specific conductance	0.05 μmhos/cm	77 μmhos/cm	200-800 μmhos/cm
Turbidity	0 NTU	6.9 NTU	5-10 NTU
Colour	colourless	Colourless	Colourless
Odour	odourless	Odourless	Odourless
Total Hardness	0	26.8 mg/L	40-80 mg/L
TDS	0	48 mg/L	Below 300 mg/L

Future study

For further purification and to make the water potable:

- Filtration technique by using membrane filter of various porosity will be performed.

Conclusion

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The advantages of solar distillers

- **Design simplicity**
- **Low installation cost**
- **Independent water production**
- **simple maintenance**

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