**Title of Project**

**Project Synopsis**

Of Major Project

***Submitted to***

***G H Raisoni College of Engineering & Management Nagpur,***

***In partial fulfillment of the requirement for the award of degree of***

**Bachelor of Technology**

**In**

**Data Science**

*Submitted by*

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| Yash Meshram | Rohini Gutte |
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*Under the guidance of*

Prof. XYZ Prof. XYZ

(Guide) (Co-Guide)



**Department of Data Science**

**G H Raisoni College of Engineering & Management Nagpur**

(Formerly Known as G H Raisoni Institute of Engineering &Technology, Nagpur)

(Approved by AICTE, New Delhi and Recognized by DTE, Maharashtra)

An Autonomous Institute Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur

**Accredited by NAAC with A+ Grade**

**Session: 2024-2025**

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We, the below mentioned students of Final year Data Science Department, wish to undergo the projecttitled **‘Title of Project** under the guidance of **Prof.** **XYZ (Guide) and Prof.** **XYZ (Co-Guide)** for the **session 2024-25.**

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**Introduction**

Renewables appear to be the one of the source which is inexhaustible, clean, eco-friendly, and cost economic. Also, it appears to be the competitive energy among the other non-renewable energy sources. Due to their abundance and its potential to use in the globe, they differ from the use of fossil fuel. Renewables will not even produce any kind of greenhouse gases which normally affect the climate which includes the reduction in annual rainfall and increased ambient temperature.

Water security presents as one of the biggest global challenges. During the World Economic Forum in 2015, water was ranked first in terms of global risk, with the highest economic impact for the next decade [1]. This high importance of the water issue is closely reflected in the Sustainability Development Goals (SDGs), not only by mentioning the water goal as the sixth goal (SDG 6), but also by considering its effect on other goals of the development agenda [2]. In addition to that, the enormous growth in the global population and industrial development increases the pressure for clean water [3]. Simultaneously, deforestation activities resulted in a reduction in rainfall. Thus, a mismatch occurs between the supply and demand of clean water. The issue of clean water availability presents a central area of research for the time-being and the future.

The utilization of solar energy in the distillation process appears to be an economical method to produce fresh water. The different types of techniques employed in pyramidal solar still (PSS) for fresh water improvement. The different heat exchange mechanism employed in solar still for enhanced fresh water. Similarly, Sathyamurthy surveyed the different geometries employed in cover and absorber of solar still for enhanced yield. The factors that affect the performance of PSS with a triangular basin and cover were experimentally studied by Sathyamurthy.

The operation of solar stills mimics the natural cycle of water. Solar energy received by the water’s surface delivers the required energy for water to evaporate, while salts and other minerals and impurities remain at the bottom; this water vapour then rises to condensate on the inner surface of the tilted transparent cover of the still where it is collected.

A solar still is a simple way of distilling water, using the heat of the Sun to drive evaporation from humid soil, and ambient air to cool a condenser film.

**Literature Survey**

The exhaustive literature survey has been carried out through various sources. The comprehensive review of literature is presented below.

Drinking water is still a big problem in dried and remote areas. Single basin solar still is a solution for this problem. This type of solar still is capable of producing clean potable water from available salty or waste water throughout the year. Single slope still is suitable at higher latitude place. Water and energy are two types’ inseparable items that govern our lives and promote civilization. Looking to the history of mankind one finds that water and civilization were also two inseparable entities. It is not a coincidence that all great civilizations were developed and flourished near large bodies of water. Rivers, seas, oases and oceans have attracted mankind to their coasts because water is the source of life. The supply of hygienic potable water is one of the major problem faced in underdeveloped and in some developed countries. Since transportation of drinking water from far-off regions is usually not economically feasible / desirable, desalination of available brackish water has been considered as an alternative approach. Several researchers have studied the effects of various designs, operational and climatic parameters. Many designs and modifications of the solar still have been proposed in literature.

**Omar O. Bad ran et. al. [5]** Evaluating thermal performance of a single slope solar still. In this study, several conclusions can be obtained as follows; (a) the increase in either ambient temperature and/or the solar intensity can lead to an increase the solar productivity, (b) as the water depth decreases from (3.5 cm) to (2 cm), the productivity increases by (25.7 %), (c) The maximum efficiency occurs in early afternoon due to the high solar radiation at this time, (d) the overall heat loss coefficient increases until it reaches the maximum in the afternoon due to higher solar intensity and ambient temperature, and finally, (e) the proposed mathematical model gave good match with experimental results. Future work can be carried out using this model to enhance the design of single solar stills.

**Anil Kumar Tiwari et. al. studied [6]** Effect of Cover Inclination and Water Depth on Performance of a Solar Still for Indian Climatic Conditions. The study leads to the following conclusions.

**Problem Statement**

**Following are the Identified Problems statements of Project,**

* Fresh water is essential for all life forms on earth.
* The available fresh water on the earth is fixed, but the demand of fresh water is increased.
* The ocean is the only available source for large amount of water.

**Objective of the Project**

**The objectives of proposed work are as follows:**

### To design, develop and install the experimental system.

### To analyzed and study parameters affecting the performance of Pyramid SS.

### To improve the efficiency and distillate productivity of solar still by integrating the Solar water heater.

### To carry out the performance of a solar still in clear, partially cloudy, cloudy days.

### To carry out the Comparative Analysis of PSS using Passive & Active Technique.

### Economic Analysis

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**Design / Block Diagram**

Design:

**Figure No. 1**

Block Diagram

**Figure 2:**

**Expected Results & Discussion**

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**Work plan**

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| --- | --- | --- | --- | --- | --- |
| **Months Activities** | **JUN’24** | **JULY’24** | **AUG’24** | **SEPT’24** | **OCT’24** |
| **Literature Reviews** | **√** | **√** |  |  |  |
| **Component Identification**  **& Selection** |  | **√** |  |  |  |
| **Designing** |  | **√** | **√** |  |  |
| **Fabrication** |  | **√** | **√** |  |  |
| **Experimental Analysis** |  | **√** | **√** | **√** |  |
| **Testing and Debugging** |  | **√** | **√** | **√** |  |
| **Preparation of Project Report** |  |  | **√** | **√** |  |
| **Thesis and Poster Submission** |  |  |  |  | **√** |

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