Automated Rain Water Gutter System

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Abstract - In this project the rain gutters are automated by Servo Motor which is controlled by Arduino, the power is given by battery and ac current supply. Roof top rain gutters are used for channeling rain water from roof to ground or rain harvesting systems. Problems arise when these gutters are often clogged with tree branches, leaves, debris and birds' droppings. Once clogged, the rain water becomes stagnant and an ideal breeding ground for mosquitoes. It provides an effective automatic method to control the roof-top rain gutters. Existing systems do not provide an automated approach with feedback in the control of the rain gutters which enhances its reliability .Commercially available solutions also do not make use of clean energy and therefore not as energy efficient.

I. INTRODUCTION

A Rain Gutter or surface water collection channel is a component of water discharge system for a building. Water from a pitched roof flows down into a valley gutter, a parapet gutter or an eaves gutter. An eaves gutter is also known as an eaves trough (especially in Canada), eaves channel, dragster, guttering or simply as a gutter. The word gutter derives from Latin gutter (noun), meaning "a drop, spot or mark".

The key features are - consists of a series of water sensors whose timing information can be used for detecting malfunction. Rain gutters and top mesh layer are made of special conductive materials which exploits clean energy, consists of temperature sensors to control water jets.

History of Rain Gutters - The Romans brought rainwater systems to Britain. The technology was subsequently lost, but was re-introduced by the Normans. The White Tower, at the Tower of London had external gutters.

In March 1240 the Keeper of the Works at the Tower of London was ordered by King Henry "to have the Great Tower whitened History both inside and out". This was according to the fashion at the time. Later that year the king wrote to the Keeper, commanding that the White Tower's lead guttering should be extended with the effect that "the wall of the tower ... newly whitened, may be in no danger of perishing or falling outwards through the trickling of the rain".

A. Rain Water Harvesting

Water our most precious resource in this world of unquenchable thirst every nation drinks at the same well 71% of the earth's surface is water 4% is fresh water but only one 5% of that is safe for human consumption we find ourselves in deep enchanted waters over the years of the rising population practices that increased demand of water supply have grown in industrial as well as in the expansion of agriculture monsoon is still the main hope and the source of our agriculture in this perception water saving has become a necessity for mankind rainwater harvesting is a way to capture the rain water at the time of downpour store above the ground or download the underground water.

B. Rainwater Harvesting Method

It is easy to collect rain water from the building, roofs and numerous other sources. As long as you are ready and you have everything with a few different items, what it needs, harvest rain water and enjoy naturally delicious, clean and useful water start? Rainwater harvesting systems can be purchased from various home improvement stores completely. The cost of these systems is different. Broadly there are two ways of harvesting rainwater.

(i) Surface runoff harvesting
(ii) Roof top rainwater harvesting

II. SURFACE RUNOFF HARVESTING THROUGH GUTTERS

A properly placed gutter is an important feature on any home. Not only does it divert rainwater from the house, but it also protects the siding and soil around the foundation from damage. These easy steps will help you install gutters if your home does not have gutters or is in need of a repair.

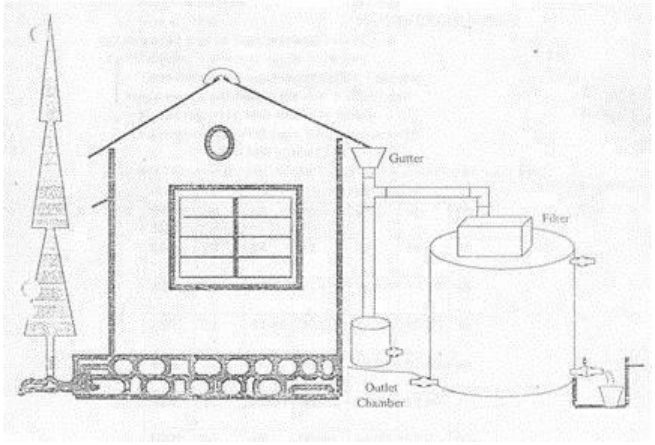

Figure 1: Block Diagram of Project

A. Working Procedure

- Automated Rain Gutters initially subtended at an angle so that open side of the gutter is faced upside down.
- When the rain starts, it rotates and attains a position which enables it to collect water.

- The pathway is rotated back to its initial position that is upside down after raining.
- This actuation is achieved with the help of a rain sensor in the servo motor controlled by an Arduino program.
- This helps in preventing the position of leaves in the pathway when it is not raining.

Figure 2: Gutter System of Flat Roof Tops

B. Components of Rain Gutters

The system mainly constitutes of following sub components:

1. Catchments
2. Transportation
3. First flush
4. Filter
5. Storage tanks
6. Purification

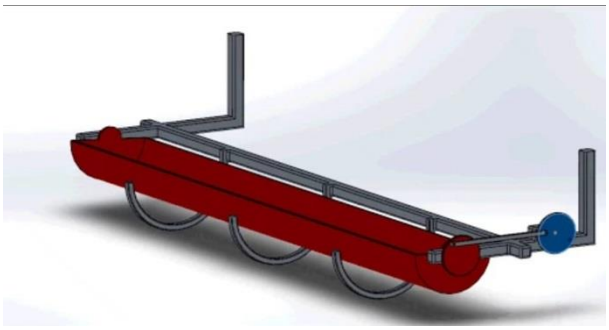

Figure 3: Model of Gutter

Figure 4: Rain Water Gutter System

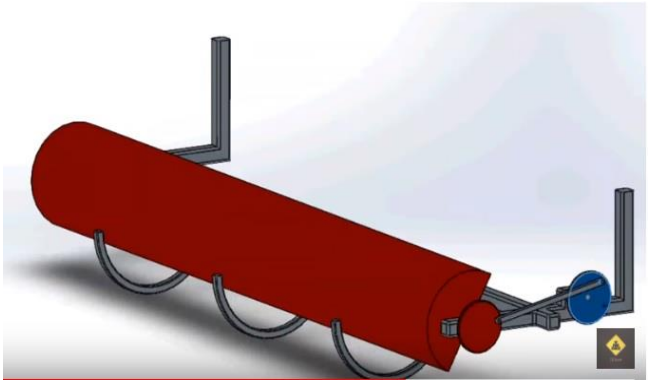

Figure 5: Gutter Upside Down Position

III. BENEFITS

The collection of rain water and they reap for everyday use has a plentiful number of exciting benefits. Let s look and discover some of these advantages:-

The biggest advantage you can find is less reliance on water storage dams. Less reliance on means to extend a reduced amount of stress on the dams and eliminating them. Because we, as a limited amount of water available and it is very expensive and the advantage here is sure to appreciate that you took time to produce water through dams.

Secondly, as soon as you begin to appreciate even a reduced amount of water consumption in the home, with rain water, you thus all your is significantly smaller bills. It would be more than 50-60% off your water billing how incredible slashes every month? To have extra money in your Pocket every month with no complaints.

Thirdly, the collected rainwater around the House can be used for many different purposes. These include the washing clothes, dishes and much more. This would prevent groundwater depletion and groundwater table supplement.

Finally, it helps to reduce that, because the flow of rain water by collecting rain water is what can prevent even urban floods reduced soil erosion.

IV. CONCLUSION

By the realization of the present work which aims to save water and replenish the underground freshwater, we will be able to accomplish saving water up to a huge extent for drinking and other domestic purpose and for future needs. The demand for water will be crucial in coming years and policies for implementing rainwater harvesters in every house will be mandatory. Their function becomes increasingly more important and challenging once they begin to be used for collecting water to be used for drinking. This project will help in the accomplishment of the aforementioned objective and in socioeconomic development.

V. REFERENCES

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