

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 3, March 2019

Design and Implementation of Low Cost Modular Atmospheric Water Generator Using IOT

Karthik R¹, Ravikumar M², K Balaji³, D Sarathy⁴

U.G. Student, Department of Electronics and Communication Engineering, GRT IET College, Tiruttani,
Tamilnadu, India¹

U.G. Student, Department of Electronics and Communication Engineering, GRT IET College, Tiruttani,
Tamilnadu, India²

Assistant Professor, Department of Electronics and Communication Engineering, GRT IET College, Tiruttani,
Tamilnadu, India³

Assistant Professor, Department of Electronics and Communication Engineering, GRT IET College, Tiruttani,
Tamilnadu, India⁴

ABSTRACT: A water seer is a structure or device that collects water by promoting the condensation of moisture from the air. Designs for air wells are many and varied, however the only designs are utterly passive. All over on Earth, even in deserts, the encompassing atmosphere contains a minimum of some water. so the water is collected by condensation process and used for some purpose. By using this device the hot air is collected form atmosphere and it is pushed underground in depth of 4-6 feet and the condensation process is done and the water droplets are collected . The Sensors are used to measure the value of temperature , moisture of the soil , water level and air pressure. The value of sensors are viewed by using the android application .

KEYWORDS: Atmospheric air, Condensation , Mobile application.

I. INTRODUCTION

Our goal of this project is to meet the increasing the water demands worldwide by condensing natural humid air and provide safety drinking water. We have planned to do it eco-friendly without use of electricity and chemicals. Water is a fundamental source of life. The air in our atmosphere contains varying amount of water vapour depending on weather. Only 2.5% fresh drinking water can be available on earth. VICI-Labs, in collaboration with UC Berkeley and the National Peace Corps Association has developed a new device “Water Seer”. Water Seer is a device that provides clean hygienic water from air by absorbing the moisture. Solar powered Water Seer is a low-cost, low maintenance atmospheric water condenser. The Water Seer could help to alleviate some of those water poverty issues. Water Seer is designed with a simple mechanism so that it works in any kind of environment especially in a rural setup. It is designed to work without an external power input and without the need of costly chemicals and maintenance.

It works based on the principle of condensation using the temperature differences. The Water Seer device is planted about six feet below the surface of the ground. The metal sides of the underground chamber are cooled down by the surrounding soil. Water Seer is a green, low maintenance and mobile water solution for any individual or community. Using condensation from the water vapour in the air, Water Seer provides an endless supply of safe drinkable water for human consumption, irrigation, wildlife or agriculture. The water collected down in the reservoir are safe and clean such water can be collector through a simple host and pump. The device is believed to produce up to 11 gallons per day, even in arid regions. The designing of the device, Water Seer provides an added advantage. As the sides of the underground chamber are always cooler than the air that enters into the device. It can collect water both day and night

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 3, March 2019

even when there is no wind. The current model of Water Seer is tested at the UC Berkeley Gill Tract Farm this spring and will be field tested in collaboration with the National Piece Corps Association over the next six months, with the intent of implement the finalized design within the next year.

Our device of experimental setup consists of a one inch pipe of length of 1.828m, closed at one end and connected to a 350 x 160mm reducer at the other end. The reducer is now in turn connected to the six inch pipe of length 3m. Now a 1&1/2 inch pipe of 3.5m is held inside to the six inch pipe in such a way that they form concentric circle when viewed from the top view. This 1&1/2 inch pipe is used as a return path pipe for the air which entered the system to come out.

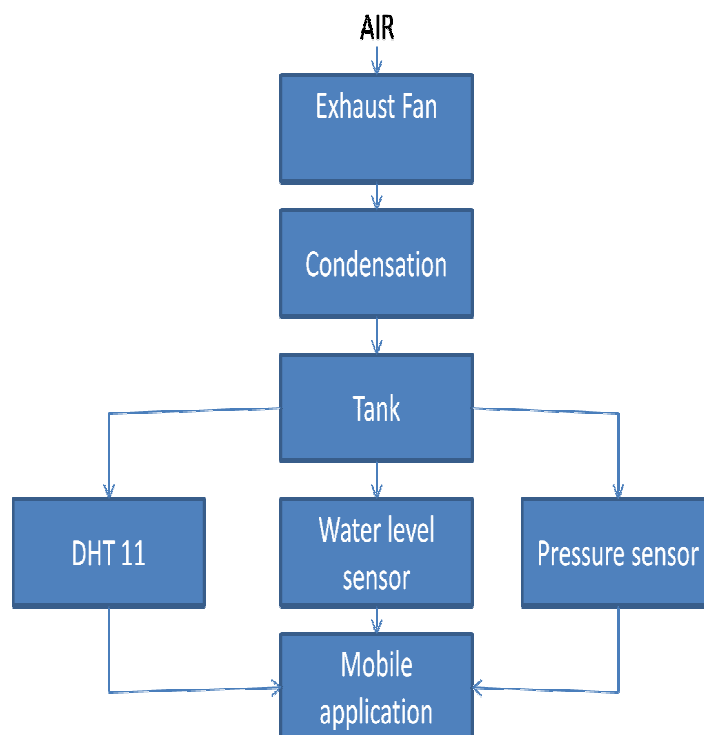
Apart from the above illustrated setup, there is a turbine and fan setup at the open end which helps to draw air into the system. Turbine being a vertical axis open sourcing wind turbine gets rotated even with a week windy action. Since the turbine is coupled with a fan, it enables the fan to rotate and pump air into the system.

II. RELATED WORK

In the existing system only the condensation process takes place by using the turbine the air is extracted and condensation takes place under ground .

1. IN our system we have used the fan to extract the air
2. Power supply is given by using the solar panel
3. To know the soil moisture , temperature , humidity , water level , air pressure we have fixed the sensors
4. The sensor values are viewed by using the mobile application

III. BLOCK DIAGRAM



International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 3, March 2019

IV. WORKING

The air is extracted from the atmosphere using the exhaust fan. The extracted air is sent to the container which is buried underground. The air is sent to the container through pipeline. When the air is passed through pipe the air pressure is measured using pressure sensor. By using the moisture sensor we sense the moisture of the soil around the container. When the soil moisture is high, the condensation process takes place inside the container and thus water is produced. After this process the amount of water secreted inside the container is measured using water level indicator. Now all the sensor values is seen through android mobile application.



The above shown cone is top most model in this model we have fixed the fan which will extract the heat air and that air is pushed down and in the top we can see the holes it is given for extracting the air.



In this we can see the fan is fixed inside the cone where a plate is fixed in that the fan is fixed in the centre so that the air is extracted and smoothly it is pushed to the pipeline.

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 3, March 2019



In the above fig we have shown the middle setup in that we have fixed the pipe to push the air in the pipeline because in the top section we have used cone so in this the air is pushed through the pipeline and it is sent to the container fixed in the under ground .

V. EXPERIMENTAL RESULTS



In this we can see the water droplets present inside the container due to condensation process



In this we can see the water where the water droplets are collected

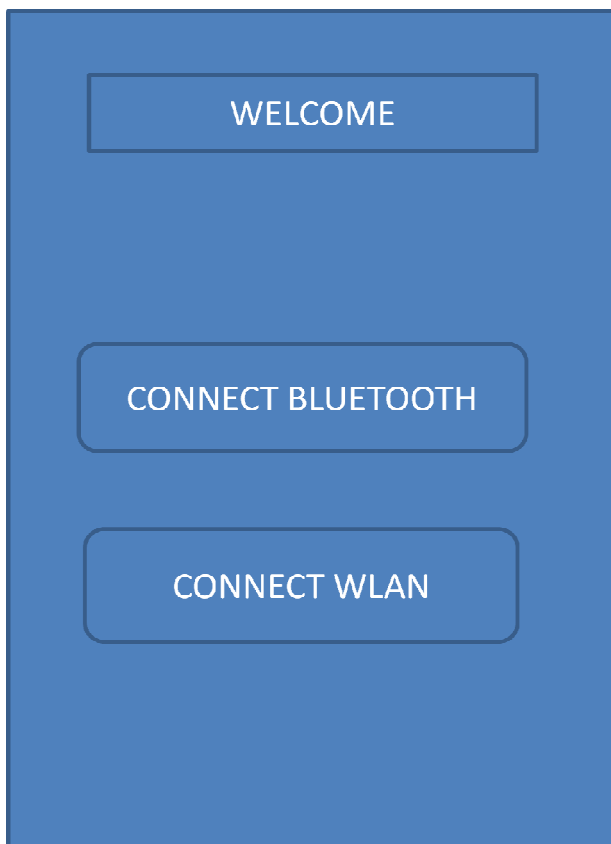
International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

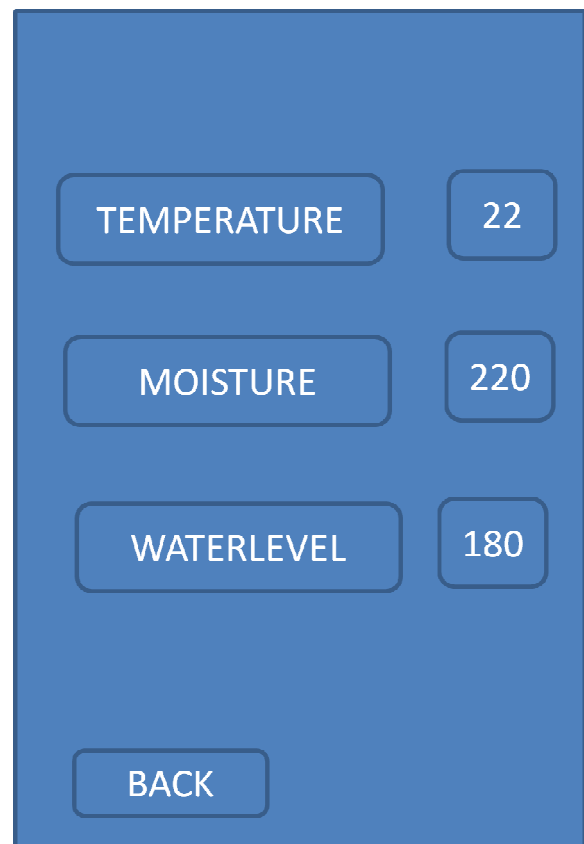
Visit: www.ijirset.com

Vol. 8, Issue 3, March 2019

MOBILE APPLICATION



Home page



Output page

VI. CONCLUSION

The water generator is a centralized system that extracts the water from the atmospheric air through the natural condensation occurring due to the natural cooling of soil under the ground. With the water generator system we can provide the water around the arid regions of the world. This can provide drinking water for a society which lacks available water. The water generator is a best solution to meet out the need of water in the world. And all the values are seen in the mobile application.

REFERENCES

- [1] S. Hanish Anand, J. Antony Freegen, A. Arun, R. Jagan, R. Suresh. DESIGN AND FABRICATION OF WATER SEER. International Journal of Emerging Technology in Computer Science & Electronics (IJETCSE) ISSN: 0976-1353 Volume 25 Issue 5 – APRIL 2018 (SPECIAL ISSUE).
- [2] Beysens D; Milimouk I; Nikolayev V; Muselli M; Marcillat J.. Using radiative cooling to condense atmospheric vapor: a study to improve water yield, Journal of Hydrology, 276, I-II. 2003

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 3, March 2019

- [3] Siddharth Wadhvani;Uday Singh;Prakarsh Singh; Shraddha Dwivedi;Smart Home Automation and Security System using Arduino and IOT. International Research Journal of Engineering and Technology (IRJET) ISSN: 2395-0056Volume: 05 Issue: 02 Feb-2018
- [4] Sharan G; Hari Prakash. Dew condensation on greenhouse roof at Kothara (Kutch), Research Note, Journal of Agricultural Engineering, Vol. 40(4), October - December, 75-76 2003
- [5] Nilsson T M J; Vargas W E; Niklasson G A; Granqvist C G. 1994. Condensation of water by radiative cooling, Renewable Energy, Vol 5 (f), 310-317
- [6] Berkowicz S M; Beysens D; Milimouk I; Hensinkveld B G; Muselli M; Wakshal E; Jacods A F G. Urban dew collection under semi-arid conditions: Jerusalem
- [7] Susmitha, T. Alakananda, M.L. Apoorva and T.K.Ramesh, "Automated Irrigation System using Weather Prediction for Efficient Usage of Water Resources", Vol.225, IOP Conference Series: Materials Science and Engineering, 2017.
- [8] Beysens D., Milimouk I. and Nikolayev V., Dew recovery : old dreams and actual results. Proceedings of the First International Conference on Fog and Fog Collection, Vancouver (Canada), pp. 269-272. 1998
- [9] Nikolayev, V.S., D. Beysens and M. Muselli, 2001 : A Computer Model for Assessing Dew/Frost Surface Deposition. Proceedings of the 2nd International Conference on Fog and Fog Collection, St John's (Canada), 16-20 July, 2001
- [10] Vargas W.E., G.A. Niklasson and C.G. Granqvist, Nilsson T.,: Condensation of water by radiative cooling. Sol. Energy, Vol. 5(f), 310-317. 1994
- [11] Knapen M.A. Dispositif intérieur du puits aérien Knapen. In : Extrait des mémoires de la société des ingénieurs civils de France (Bulletin de janvier-février 1929) : Imprimerie Chaix, Paris, 1929
- [12] Chaptal, L, 1932: La lutte contre la sécheresse. - La captation de la vapeur d'eau atmosphérique. La Nature (Paris), Vol. 60, 449-454, 1932.