



# **EFFICIENT METHOD OF IRRIGATION AND WATER LEVEL MANAGEMENT IN AGRICULTURAL LANDS USING SENSORS**

**Hari Karan.B**

Dept. of Electronics and Communication Engineering, IFET College of Engineering, Villupuram, Tamilnadu

[harikaran.baskaran@gmail.com](mailto:harikaran.baskaran@gmail.com)

**Mr. S.Mohamed Nizar M.E.**

Dept. of Electronics and Communication Engineering, IFET College of Engineering, Villupuram, Tamilnadu

[Nizar.shabu@gmail.com](mailto:Nizar.shabu@gmail.com)

**ABSTRACT**— *Agriculture is that the back bone of our country. Most of the folks in our country considers agriculture together of their major occupation. The foremost necessary part of agriculture is that the method of irrigation through that great deal of water is wasted within the agricultural lands. To avoid the wastage of water resources, an automatic irrigation system is meant .The planned system is employed to keep up constant quantity of water must be stagnated within the agricultural land. The automated irrigation system is principally dole out with the assistance of the soil wet detector. The pump within the field is principally controlled with the assistance of DC motor and with Arduino microcontroller.*

*Due to unlooked-for rain and floods, agricultural fields are sunken in water. To avoid this downside a water level management system was planned additionally to the automated irrigation system. During which the water level in agricultural fields is maintained properly throughout serious rain and it's finished the assistance of water level driver board which is employed to live the number of water stagnated within the field.*

**Index Terms**— *Arduino microcontroller, soil moisture sensor, water level driver circuit board, DC motor, stepper motor*

## **I. INTRODUCTION**

**A**GRICULTURE uses nearly eighty fifth of water resources everywhere the worldwide and this share is principally thanks to the rise in population and increase in food demand. To avoid over usage of water a model is planned to scale back the usage of water with the assistance of rising trends in science and technology. With the assistance of some methodologies, regular based mostly irrigation is done through that the usage of water is reduced and might be saved for future use. By this technique every drop of water is employed in the economical method.

Water deficiency is one among the rising hazard in today's present time. in step with the international organization World water program Report ,70% of the world's fresh resource area unit being used for irrigation purpose. There's associate degree imperative have to be compelled to develop, associate degree improved and economically affordable irrigation approach for reparable use of water resources within the field of agriculture. In earlier technique of irrigation high man power is needed to this huge quantity of water is wasted.



However, the major downside of these systems is that they area unit complicated and creating them useless for tiny scale and marginal farmers. Thus, the challenge is to develop a reasonable and simplified machine-driven irrigation system. This project presents the machine-driven system to form effective utilization of water resources for agriculture and water level observation.

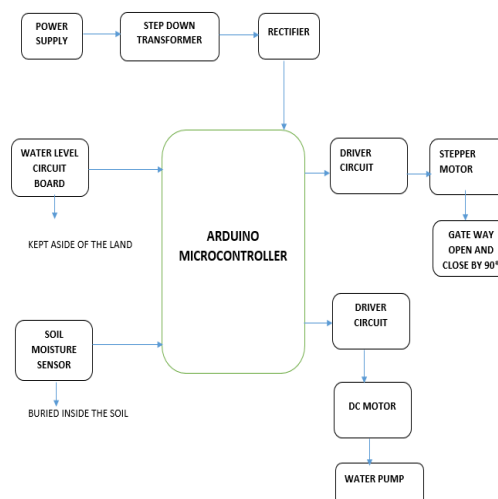
## II. LITERATURE SURVEY

There are unit several systems accessible to attenuate the usage of water in agricultural lands. In earlier days they used associate degree diode indication to see the wet content within the soil [1]. Later a pc controlled technique is employed for the method of irrigation that in terms needs a person power for dominant the pc [2]. Later a microcontroller based mostly irrigation system is employed for observation the wet content of the soil [3]. Later a GPRS module is employed for the method of automatic irrigation system [4]. Recently that they had planned system of automatic irrigation system victimisation the wireless detector networks [5].

## III. PROPOSED SYSTEM

In projected model additionally to automatic irrigation system associate degree water level management system was used. With the assistance of this technique the number of water stagnated within the field are often controlled. Throughout serious rain there'll be decaying of crops within the field. To avoid that a way is meant to regulate the extent of water.

The water level is maintained with the assistance water level driver card. Main operate of the water level card is to take care of constant quantity of water level within the agricultural field. The water level card principally operates with the assistance of IC555 timer IC.



**BLOCK DIAGRAM OF PROJECTED SYSTEM**

#### IV. PARTS AND DEALINGS

The on top of block offers a transparent rationalization regarding the projected model. Allow us to discuss very well regarding the functioning of every blocks within the system as follows,

*a. Arduino microcontroller:*

Here arduino microcontroller is taken into account to be the guts of the system. The most operate of the arduino board is to figure primarily based upon the command given by the external supply. Within the projected system arduino is principally wont to management the pump and for dominant the valve employing a stepper motor.



*b. Step down transformer:*

Step down electrical device is that the one during which range of windings within the primary facet is high in comparison to the quantity of windings at the secondary facet. The most operate of the step down electrical device is to convert the input 230V offer into 15V offer.



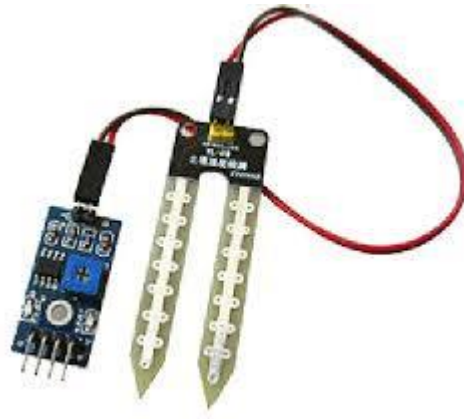
*c. Rectifier:*

The output power from the step down electrical device is regarding 15V. However the microcontroller needs solely 5V for functioning. Thus we tend to square measure victimisation the rectifier board. It consists of associate degree built-in transformer circuit that is principally wont to convert the 15V input offer to 5V offer. The most operate of the transformer circuit is to produce a continuing power supply to the circuit.



*d. Soil wet sensor:*

To monitor the wet content within the soil here we tend to use soil wet device during which the device is unbroken within the soil that measures the wet level within the agricultural land. If the wet content within the soil crosses a threshold price.

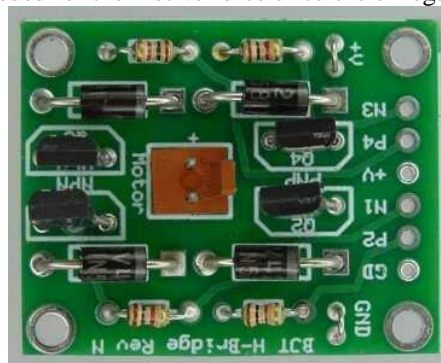


*e. Water level driver circuit board:*

The water level driver card is principally wont to maintain the constant quantity of water within the agricultural land. It principally operates with the assistance of 555 timer IC. The circuit has 2 terminals to live prime and bottom level. If water is in lower level then the valve are going to be closed and if water reaches the utmost limit then the additional water are going to be drained out from the sphere.

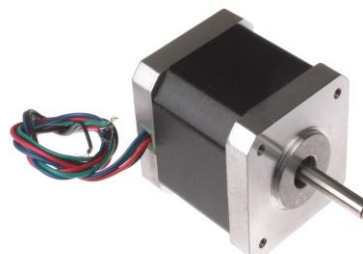
*f. Driver circuit:*

The main operate of the motive force circuit is to drive the DC motor or stepper motor supported the commands given by the arduino. The number of power offer needed for the motive force circuit is of regarding 5V.



*g. Stepper motor:*

The gate valve is employed to empty the additional water within the field and it's principally through with the assistance of bipolar stepper motor. The most reason for victimisation the stepper motor is that it will able to rotate in each right-handed and in anticlockwise direction. With the assistance of stepper motor the valve are often turned in 90\* right-handed and anticlockwise direction.



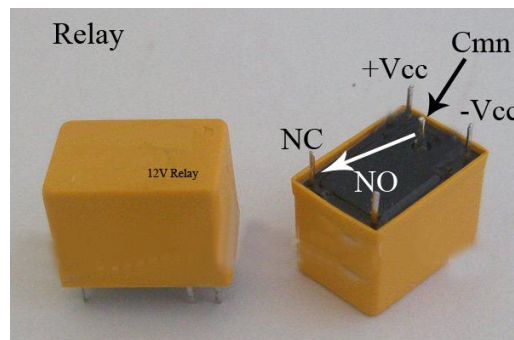
*h. DC motor:*

The DC motor is principally used to manage the pump supported the wet content of soil. If wet level of soil goes on the far side intensity then DC motor is activated with the assistance of arduino. DC motor ought to be of high rev which may run the pump.



*i. Relay:*

The relay acts as a switch. It operates to modify ON and OFF the motor utilized in the circuit. Relay consists of 5 pins. 2 pins for power supply and one pin for ground and another 2 pins for commonly open and commonly shut.



### V. WORKING OF PROPOSED SYSTEM

The wet is measured unceasingly within the agricultural field if the water level goes on the far side the brink value then the data is sent to the arduino and it activates DC motor with the assistance of driver circuit that activates the pump. By this methodology needed quantity of water is flowed to the land. If soil reaches the wet price then DC motor can close up.

Water level card is unbroken aside of the land. Throughout serious rain great amount of water are going to be stagnated within the field. If the water reaches the highest level then the stepper motor is ON through that the valves opens by 90° right-handed direction. When exhausting the additional water it reaches lower level and valve rotate 90° anticlockwise direction by stepper motor.



## VI. CONCLUSION

The machine-controlled irrigation system applied was found to be accomplishable and price effective for optimizing water resources for agricultural production. The machine-controlled irrigation system developed proves that the utilization of water are often reduced. Besides the financial savings in water use, the importance of the preservation of this resource justify the utilization of this sort of irrigation systems.

With the assistance of water management system the wastage of crops are often avoided through that the money standing of the farmers are often maintained properly.

## REFERENCES

- [1] "Review supported automatic irrigation victimisation RF module"-2015
- [2] "Essential methodology of irrigation victimisation wireless device network"-2015
- [3] "Power estimation and automation of greenhouse victimisation wireless device network", IEEE, Confluence future Generation info Technology Summit 2014.
- [4] "Application and analysis of high power Zigbee primarily based wireless device network in water irrigation management observance system", IEEE conference on Industrial natural philosophy and Applications, vol.2, 2012.
- [5] Thulasi Priya, K.Praveen, A.Srividya, "Monitoring Of Pest Insect Traps Using Image Sensors & Dspic", IJETT, Vol 4.-2010