IOT Based Automated Irrigation system

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Abstract

Modern science and technology help us in every sectors of our livelihood. We human being cannot passed a single day without foods, so we have to help the food manufacturers known as cultivator or farmers. Our main target is to make farmers life better and easier. An Automated irrigation system with the help of IoT is very subsidiary for the farmers to cultivate more foods and fruits and it also reduce their works as well as time. Automation allows us to control various applications such monitoring water supply, check light, temperature, humidity, measure soil moisture and crop health, animals scaring directly. Automated irrigation system helps farmers to improve their livelihood.

1 Introduction

Bangladesh is one of the thinly populated country all over the world with a population about 165 million and which enrich day by day. Bangladesh predominantly an agricultural country. We consider agriculture is the foundation of our national GDP [6]. Most of the people of our country choose farming as their occupation for their livelihoods. As the present era, the farmers of our country have been still using transnational approach to do their work manually which consume a lot of time, money, water, land and hard labour so that its effects our economy as well our enhancement. As a populated country for balancing between the population growth and make a healthy nation we have a lot of things to be done. The flourishing population need more agricultural production for survive. Currently farmers are trying to adopt

new technologies and smart farming to enhance the sufficiency of their sustenance production systems. One of most common technology is known as IOT (Internet of Things) through it now farming has gargantuan efficient to improve. Irrigated agriculture helps the farmers to grown more agricultural production. IoT technologies have so many applications to make farmers life easier. IoT technologies in agriculture [1]. Generally, 2types of control system are most used -weather based and soil based. For agricultural growth IoT based smart irrigation system also create an IoT base automate irrigation mechanism which turns on and off the pumping motor through command which develop by IoT platform [2]. As IoT based automated irrigation system simple, budget friendly, easy to use and install, help to grow more crops or fruits in less timing and employment so that farmers are now most interested to implement this system and make their livelihood more spontaneously.

2 Research Background

Bangladesh known as an agricultural country all over the world. Most of the people of Bangladesh depends on agriculture. So, it is essential to increase the production of crops. Automated irrigation system can develop the production of foods. To developing the economics, condition the farmers have to proper knowledge about agriculture, agricultural sectors and they have to able to take proper decisions to improve their yielding [3]. Still, most of the farmers of our country use old manual methods to grow agricultural stuffs. For that they are not able to produce much more crops as they desire. To enrich their production of crops they should apply automated system in their field. Automated irrigation system mainly sensor based and they perform atomically [4]. In manual irrigation system there are many traditional techniques available like- sprinkler system, drip, terraced and ditch irrigation. These techniques are not good to grow enough food for the people of Bangladesh. At present semi-automated and automated system replace the traditional manual techniques. An automated irrigation system is very helpful to grow excessive foods, provide sufficient water supply to the field and reduce the waste of money, time, water of the agriculturalist [5]. Automatic micro controllers control the whole system with the help a developed smart application. An automated system performs all the necessary operations using many sensors, camera, micro-controllers, raspberry pi, WiFi or mobile networks to monitors farmers field and harvest [7]. Currently some system use technology to reduce the number of workers and to reduce the time required to water the plants. Satisfactory work is done in this technology of smart irrigation by using raspberry PI as well as IoT is the interconnecting of devices and services that reduces human intervention to live a better existence. The system would provide feedback control system which will monitor and control all the activities of irrigation system efficiently.

At the present era, one of the greatest problems faced by the world is water scarcity and agriculture being a demanding occupation consumes plenty of water. Automated irrigation system helps to overcome this problem and estimate diminution of existing plant moisture in order to operate, restoring water as needed while minimizing excess water usage[14]. Exploration in the agricultural field, we found that the yield of agriculture goes on decreasing day by day. Now the farmers have been using irrigation technique in Bangladesh through the manual control in which the farmers irrigate the land from time to time.

3 Research Question

1. How does the smart irrigation system work?
2. Why it is important for the farmers?
3. How farmers use this system?
4. If it is better than other system than why?
5. What is the advantage who are the use this system?
6. If it is helpful our economic condition than how?
7. Does the system helpful for our environment/country/soil?
8. What is the cost of smart irrigation system? /How much money need to buid the smart irrigation system?

4 Research Method

Research are two types one is pure other is applied.Between two this research follow pure research.Pure research are known as developing or testing.It is also related with investigate any technique.In this research we work on just theoretical data.

We are using smart irrigation system, it is very essential for increasing more food for our populated country and it is also helpful for our economic condition. Smart irrigation system is better than manual system for our developing country.So if we use this system we can earn more crops.We can export crops to the foreign country earn foreign money.Our GDP will be increased[13].

In smart irrigation system there are some types of sensor Exp:light sensor, temperature sensor,soil moisture sensor etc.That we have measure temperature, if the temperature high it is not good for crops [8].So this sensor we measure temperature and it is good for production of crops [9].Smart irrigation system play a vital role for producing good number of crops.This smart irrigation system save power and water,and it is grateful to our country[10].When a farmer use this system they can save their strength and time.It can be implemented easily and done by short time/low cost.In smart irrigation system those sensor can get accurate data from this field.If we do not use those sensor we can not get valuable result. So, we need those sensor to get a proper value.

In our smart irrigation system different sensor are used.When we use the system all the sensor activate mode.those sensor collect data from the field.In this system there will be a threshold value.If the collect data is lower than the threshold value than pump is turn ON mode.And when the collected data is higher than the threshold value the pump is turned OFF[11,12].And there are additional light sensor this is use for green house.

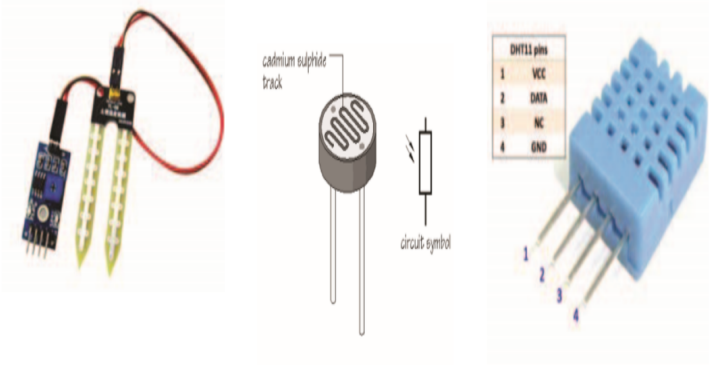

Figure 1: Soil Sensor,Light Rsistor,Temperature Sensor

5 Significance of Research

The result of the study will be great benefit to the farmers. The data given will provide the farmers with information how they can improve crop yields, quality and reduce costs[15]. The data gathered will help them to plan for future cultivation of more crops in a new way with new technology.

This study will help them to acknowledge with science and technology. They will know how to utilize time and use of smart irrigation system together to reduce their workload and lead a better life. The results will evaluate better performance in

the field and optimize the farming by season[10]. This study will provide them the increase of productivity that is, the farmer can spend more time on other tasks[10]. In addition, this study acknowledges with the suggestion of controlling strategy for watering when the farmer would like to cultivate mixed crops [10].

The researches and information pertaining to the use of smart irrigation system using IOT is not widely known to all farmers. They are either spending lots of time in cultivation or get disheartened after being half-fed or unfed due to shortage of foods. They should be advised fully the consequences of using smart irrigation system. The study will give an emphasis on how smart irrigation system works and the results of using it. The information collected will help in the upcoming strategies and help the farmers to cultivate more and more crops.

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