Using Arduino Smart Agriculture Monitoring System

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ABSTRACT

India is the quickest growing large monetary machine within the international, with a large populace useful demographics, and excessive size up ability. In India, agriculture is a primary interest, around third of India's population remains strutted upon agriculture. In developing international locations, farmers aren't the use of clever agriculture approach however in the event that they begin the usage of smart agriculture approach within the assist of this method, they could produce top yield vegetation, huge range of incensement at the agriculture, and can make advanced amount of earnings, To laden lengthy time expenditure in agriculture, use of renewable strength is important for that smart solar is the number one strength which may be use.

Keywords *Smart solar system · GSM module · Internet of things*

1. INTRODUCTION

India is the speediest growing great financial system on earth, with a massive populace, helpful demographic, and excessive size up ability. In important vicinity of financial system, physical activities are tried through on double using commonplace property. Farming, fishing, dairy, and different everyday objects are allude to as so in lightof the fact that they shape the bottom of all specific item. Since restrict of the function time weget is from farming, dairy, fishing, its far likewise referred to as agriculture and untied area. Agriculture performs a essential ability within the Indian financial formwork. More than 70% of the rustic households depend on farming. Agriculture is a enormous the Author(s), under exclusive license to Springer Nature Songapore Pvt Ltd. 2021 R.N.Shaw , AI and IOT in renewable Energy, Studies in Infrastructure and Control, Vicinity of Indian economic framework since it makes commitments around 17% and large GDP and offers paintings to greater than 60% of the population. Agriculture is the generation and paintings of cultivation of flowers and domestic animal. Farming become the evolution for improvement of mankind.

Problems of over exploitation of ground water in India are bound to become more acute and widespread in the years to come in less corrective mechanism are put in place before the situation becomes worse. Other problems related to farming like maintenance of humidity level, maintenance of proper temperature, proper availability of light for sophisticated plants, keeping a check on unwanted enter in the farming lands and fire alert require a need of technologies solution. On the other hand, the most important parameters for the agriculture is regular and adequate supply of electricity. Highly unreliable power supplies with frequent power cuts have not only lowered the effinciency but also yhe cause problems to the farmers who cannot start their work without it. Apart from the problems mentioned here there are lots of problems in the field of agriculture which need to be addressed with solution using technology.

The proposed system uses a hardware which provides an effective and efficient solution to the defined problem in Indian farming system. The solution provided is eco-friendly, economical and electronically operated, making Indian farming system more farmers friendly. The proposed system is connected with internet sing node MCU wi-fi Module capable of displaying real time data which can be seen and accessed over internet using IOT technology from anywhere in the world.

2. PROPOSED SYSTEM DESIGN AND WORKING PRINCIPLE

Present-day farming is another and rising idea utilized in developing the yield of a harvest with the aid of using advanced technology to help in conventional cultivating rehearses. Ideas, for example, exactness in Agriculture (PA), Internet of Things(IoT), Wireless Sensor Networks (WSN), and many other techniques are utilized with conventional framing to help in the profit of harvests, growing efficiency, and control- ling of expenses. The purpose of the execution is to exhibit the smart and brilliant estimated and conveyed to the objective, time stamps were set on the bundles and stock, which would then be able to be explored later to decide any potential activities that are expected to additional consideration of the yields. Figure 1 shows the assembled system with different component. which goes about as an IoT gateway. "This passage has been given the wi-fi carrier through putting in a GSMmodule if you want to be updating the records to the cloud". With the help of GSMmodule, we can also capable of operate our tool over 2G and 4G networks. The frameworks had been diverse in that the sensor hubs deliberate, utilized specific detecting units for tracking environment. In sensor hubs comprised of soil wetness, temperature, air humidity, and laser sensors. In sensor hubs, the first-class effective is to collect a soil wetness sensor. In maximum of the device planned, hubs didn't contain any energy collecting devices, and as such should great effective ability for a particular time period earlier than the hub's electricity flexibility should want to be supplanted. In this paintings, we extend on top of those recently published works, and moreover make the most the segments that take lead of the detail gift within the blueprint of a faraway loT agency [9, 10]. Sensors networks had been geared up with photovoltaic panels for energy harvest that allows you to rise the general run-time of the network. When sensor information become Estimated and conveyed to the objective, time stamps were set on the bundles andstock, which could then be capable of be explored later to decide any ability activities which are anticipated to extra consideration of the yields [11, 12]. Figure 2 shows the assembled machine with distinct additives. Abilties of the microprocessor to allow the alternatives to be taken on irrigation of the vegetation, checking the temperature of fields, soil moisture, and plenty of more primarily based at the non-prevent monitoring of the ecological situations inside the field.
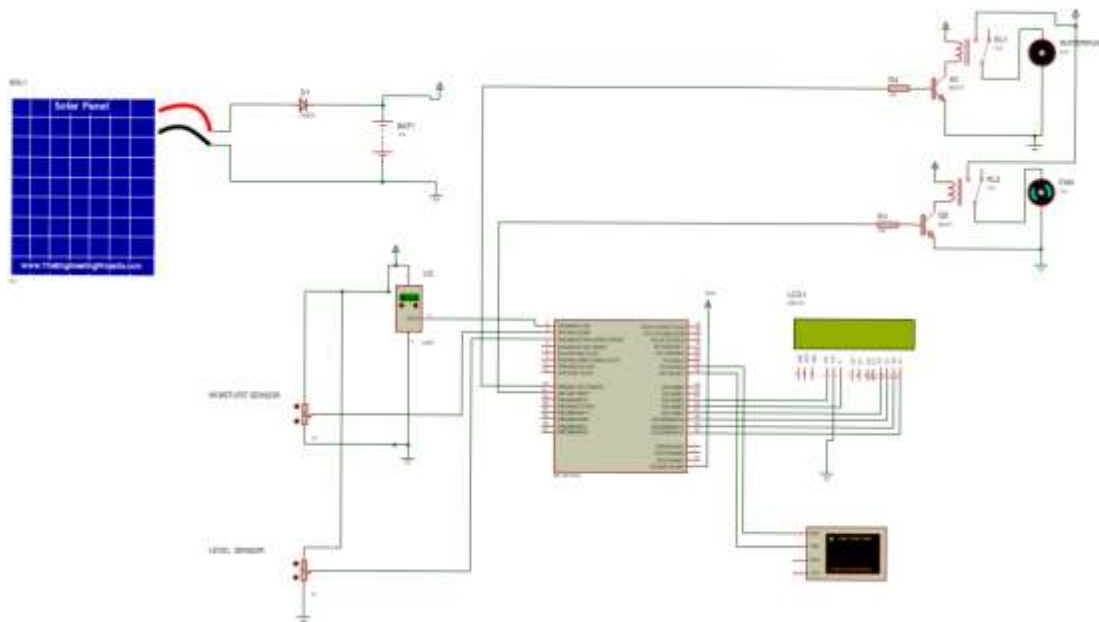
3. PROJECT PICTURE.

4. SENSORS

a) Soil Moisture Sensor

This sensor can be used to test the moisture of soil, when the soil is having water shortage; the module output is at high level, else the output is at low level. By using this sensor one can automatically water the flower plant, or any other plants requiring automatic watering technique. Module triple output mode, digital output is simple, analog output more accurate, serial output with exact readings.

b) Humidity And Temperature Sensor

This DF Robot DHT11 temperature and humidity sensor features a temperature and humidity sensor complex with a calibrated digital signal output. By using the exclusive digital signal acquisition technique and temperature and humidity sensing technology, it ensures high reliability and excellent long-term stability. This sensor includes a resistive type humidity measurement component and an NTC temperature measurement component, and connects to a high performance 8-bit microcontroller, offering excellent quality, fast response, anti-interference ability and cost-effectiveness.

c) Water Level Sensor

Water level sensors are used to detect the level of substance that can flow. Water level and flow sensor can measure the discharge of an open water channel for irrigation modeling to better predict feature water Availability in Agricultural.

5. SOFTWARE USED

i. Arduino IDE-

In order to connect all the hardware components together, an Arduino Uno microcontroller was used. The Arduino Uno was selected based on its low power combustion and easy to development in configuration all to component together.

ii. Espressif System-

Espressif System Smart Connectivity Platform (ESCP) is a set of high performance, high integration wireless SOCs, designed for space and power constrained mobile platform designers. It provides unsurpassed ability to embed Wi-Fi capabilities within other systems, or function as a standalone application, with the lowest cost, and minimal space requirement.ESP8266EX offers complete and self-contained Wi-Fi networking solution, it can be used to host the application re to offload Wi-Fi networking functions from another application processor.

6. CONCLUSION-

Smart agricultural field watching framework can expect a big feature in Agricultural international locations. Through this frame work, soil circumstance may be monitored. This framework can assist with continuing cultivation and correctly. This body work forestalls the misuse of water. Some more sensors with greater records investigation must be viable as destiny work of this chapter. IoT sensors have excessive performance and accuracy, so it is simple to gain the direct records of ground wateriness and warmth in agriculture field. The water tiers indicator is used, so prevents the waste of water and saves water, it helps the farmers to enlarge their production. By forcing this frame work, farming, plants lands, parks, gardens, golfs courses may be irrigated. Thus, this device is more low prized and proficient while.

7. REFERENCES

1. *Khanna A, Kaur S (2019) Evolution of net of factors (IoT) and its enormous Impact in the area of precision agriculture. Comput Electron Agricult 157:218-231*
2. *Tzounis A, Katsoulas N, Bartzanas T, Kittas C internet of things in agriculture recent advances and future demanding situations. Biosyst Engg 164.*
3. *Dhanasekar N, Kayalvizi R Accidental navigation and rescue device using GSM and GPS era. Asian J Res Soc Sci Humiltes 6(11):158-166*
4. *G. Mehta, G. Mittra and V.K. Yadav, Applicatopn of IoT to optimize Data centre opretatioons, in complaints of international conferences on computing, power and communication technologies 2018, Greater Noida, pp. 738-742*
5. *Sadowski S, Spachos P (2018) Solar-powered smrt agriculture monitoring machine the use of internet.*