Review on Flooding System Using Solar Power

Mr.K. Pradeep Kumar[1] S.Gokul[2] M.Gomathi[3] N.Muthukumar[4] M.M.Pujara[5]
[1]Professor [2,3,4,5]Student
[1,2,3,4,5]Department of Agriculture Engineering
[1,2,3,4,5]Nandha Engineering College, TN, India

Abstract— Solar irrigation uses the sun's energy to power a pump which supplies water to crops to help growth .Cost effective solar power can be answer for all our energy needs. The solar charge controller is used to store DC power of solar panels in batteries. This battery is used for water pump automatically. It works on sunlight. It gives solution for Indian farmers due to energy catastrophe.
Keywords: Energy catastrophe, solar power, solar collector

I. INTRODUCTION

Solar energy is the most ample source of energy in the world. Solar power is not only a solution for today's energy catastrophe but also an ecofriendly forms of energy. Solar cell peer group is the systematic approach for using the solar energy. Solar collectors are nowadays meticulously used for running street lights, for powering water heaters and to meet domestic loads. One of the application of this mechanization is used in flooding systems for husbandry. Solar powered flooding system can be a suitable substitute for farmers in the current state of energy catastrophe in India.

II. LITERATURE SURVEY

A.R.Al-alia[1] et al in 2001 said that, the consumption of photovoltaic electricity in a mechanized flooding system. The tentative setup consists of the controller, control valves, photovoltaic (PV) panels, back up batteries, and sensors. The system is proficient of flooding the fields at a pre-specified time, day/s of the week, and duration. It can also routinely irrigate the field if the soil is dry out below a certain required value. This type of mechanized system will optimize the quantity of water required for a specified crop and area. This system will also help in saving water, besides its other gains.

S.Agarwal [2] et al in 2012 said that, the paper attention on a BJT based soil moisture sensor which can be implemented in a large irrigation field. Soil conductivity depends on the moisture content around the probes. A microcontroller is used to scan the array of sensors for output values by operating a switch IC. This paper also shows the results of the experimental conducted using this sensor to highlights the impact of the potash and urea fertilizer on the soil properties.

KCK Reddy [3] et al in 2013 said that, this paper aspiration to manifest a field monitoring and controlling system that is capable of real time and authentic measurement of field statistics. The system is composed of distributed sensing devices such as temperature sensor, moisture sensor and pressure sensor. Sensing unit has sensors and analog to digital converter (ADC) to convert analog sensed signal to digital data. This digital data is processed by the micro controller unit. From here the data is sent to the GPRS (General Packet Radio Service) module and uploaded to the server from which farmer can access the data from anywhere in the world. The information is also sent to LCD module.

M.Giri [4] et al in 2013 said that, this paper deals with the automated drip irrigation system irrigation system uses valves to turn irrigation On and OFF. The intend of this paper is to furnish more facility in agriculture field by using wireless sensors network along with linear programming it describes an application of low-cost wireless controlled and monitored irrigation solution.

Ms. Jyotsna Raut [5] et al in 2014 said that, the advanced system consists of sensors placed in the farm area, a control station and a base station. Wireless sensor network (WSN) uses ad-hoc networks which support flexibility and self-configuration which is favourable for agricultural application. Data acquired from different sensors is provided to the base station by wireless transmission using zigbee. Once the data are received at the base station, further data processing and computation requirements for decision making are carried out by using data mining algorithm. When real time data is delivered, farmers are able to achieve self-regulating crop irrigation system. Hence such enhanced automation for irrigation provides a good electric & water conservation with more efficiency.

S.Harishankar [6] et al in 2014 said that, solar energy is the most ample source of energy in the world. Solar power is not only the solution for today's energy catastrophe but also an environmental friendly form of energy. According to the survey directed by the bureau of electrical energy in India in 2011 there are around 18 million agricultural pump sets and around 0.5 million new connections per year is mounted with average capacity 5HP.Total annual consumption in agriculture sector is 131.96 billion kwh (19% of total electricity consumption).Sine PWM technique has been used for inverter operation for minimum harmonics as given in paper which further increases the efficiency of the system. In this system they utilize a soil moisture sensor that detects the amount of moisture appear in the soil and depending upon the condition of level of moisture content.

VS Janga [7] et al in 2015 said that, Our project aims to implement the basic application of the irrigation field by programming the components and building the necessary hardware. GSM works through SMSs and is the link between ARM processor and integrated unit. ARM7TDMI is an advanced version of ARM microcontroller and forms the heart of system. This project is used to detect the exact field condition. GSM is employed to notify the user about accurate field condition. The statistics is given on user request in form of SMS. In this paper we introduced a low cost and efficient wireless sensor network technique to acquire the signal moisture and temperature from various location of farm.

K Nilson [8] et al in 2015 said that, to make the sustainable agriculture, this system is proposed. This paper introduces a fully automatic drip irrigation system which is operated and supervised by using ARM9 processor. PH content and the nitrogen substance of the soil are frequently

observed. For monitoring and controlling, GSM module is employed. The system informs user about any atypical conditions like less moisture content and temperature rise, even concentration of CO2 via SMS through the GSM module.

PB Yahide [9] et al in 2015 said that, In drip irrigation water is given to root of plants to save water and stop land infertility and nutrition count. In irrigation farmer have to keep timetable for irrigation which adjustments as per crop, soil and weather. Web based intelligent drip irrigation system is one and only key to water management and exactitude agriculture. In web based system we can control water supply using solenoid valve. This whole system is micro control based and can be operated from remote location through web based. It gives biggest profit from lowest cost.

Prof. Rashmi Jain [10] et al in 2016 said that, The main objective of the present paper is to develop a intelligent wireless sensor network (WSN) for an agricultural environment. This paper investigates a remote monitoring system using RF module. These nodes send data wirelessly to a central server, which collects the data, stores it and will allow it to be analyzed then displayed as needed and can also be sent to the client mobile. In this knowledge, the humidity and temperature of plants are accurately monitored. Very challenging to provide the homogeneity at all the places in the farmstead manually. It is stated that for the first time an android phone-regulate the Irrigation system, which could provide the facilities of providing uniform environmental conditions are recommended.

Yogesh G [11] et al in 2016 said that, The development of automated irrigation system, soil moisture content is more important parameter as compared to others as it has crucial role in plant growth mechanism and availability of water for irrigation is major concern for the farmers specially the ones who are dependent on rain. The electrical conductivity measurement is the most simple, cost effective and power efficient method of all. But it is not precise and its results vary over time. P. Bhosale and V. Dixit developed weather monitoring system. They used wide range of sensors for monitoring namely atmospheric temperature and humidity (SHT1x), Soil temperature (LM35), Radiation and sunshine, soil moisture (gypsum block based on resistive technique), wind speed and direction (anemometer) and rain fall. In control board PIC microcontroller was used.

Ms Shwetha P.S [12] et al in 2016 said that, there has been a numerous research and development in the agriculture field and it is increasing at a greater speed. The requirement of growing the yield precisely depends on the soil pH, soil temperature and numerous other factors which has developed the main area of importance for the researchers. Using electromagnetic sensors, the soil moisture was spotted, based on which the land was flooded. This has manifested to lessen the wastage of water by 53%. Drip irrigation has apparent to be advantageous as it reduces the wastage of water by directly applying water and fertilizers to the root zone. Microcontroller based drip irrigation system using the sensors have been a major development in the agriculture.

Sujatha dasgupta, mit patel [13] et al in 2016 said that, India has around 18 million grid connected and 7 million diesel-operated irrigation pumps. The grid based pumps consume nearly 20% of electricity which require 85 million tons of coal on an annual basis. Scarcity of electricity coupled with the increasing unreliability of monsoon rains and prevalent costly diesel pumping systems pose an economic risk to small and marginal farmers. The solar PV array is a set of solar cells connected in series and possibly strings of modules connected in parallel. DC drives powering a brushless DC motor. AC drives powering a centrifugal pump unit. DC drives with brushed positive displacement pumps. The potential of solar PV water pumping in India is huge and the market has clearly started to develop. There are reportedly more than 12 million electric and 9 million diesel irrigation pump sets in operation.

Avinash chitransh [14] et al in 2016 said that, to provide a solar powered microcontroller based mechanized flooding system. Decreasing of human intervention in farm land flooding can be done by using this automated technology. The use of moisture sensor, humidity sensor and water level sensor all together sends the signals to microcontroller which further sends the various statuses as read by the sensors to user mobile through GSM. The farmer (user) can control all fooding operations through his Android mobile device.

Dr.S.Jothi Muneeswari [15] et al in 2017 said that, The paper is focus on sensor based mechanized flooding system using IOT sensor flooding takes place surrounding temperature and humidity. The flow of water is managed by solenoid valve in this System Using a WSN and GPRS Module mentioned in it from which irrigation will take place by wireless sensor units (WSUs) and a wireless information unit (WIU), connected by radio transceivers that permitted the transfer of soil moisture and temperature data. This system will be very cost-effective in terms of the hardware cost, power consumption and call charges. Farmers have to regulate (on/off) the valves time to time (even at night) which increases the running cost because every time we have to make a call to on or off the valves and it is also very inconvenient. This system is automatic and manual mode. This system increase the crop fields, improve the crop quality, increase the energy and reduce the non-point source pollution. Due to PIC microcontroller the length of the program will be big because of using RISC (35 instructions).

Jia uddin [16] et al in 2017 said that, Variable rate automatic microcontroller based flooding system. Solar power is employed as only the source of power to monitor the overall system. Sensors are situated on the paddy field and these sensors constantly sense the water level and deliver the message to the farmer notifying the water level. Without go to paddy fields, farmers can get hold of the data about the water level.

Alok gora,M [17] et al in 2017 said that, A suitable technique is to be needed for the flooding process because of ambiguity of rain and scarcity of water in land. The water level of the soil always affects agriculture. There are two major elements one is soil moisture sensor and other is solar energy, retained the moisture in the field. If the required level of water is not supplied, then the plant will die and results in minimal production. In India, agriculture field is saturated by manually in most of the cases. This valve controlled by soil moisture sensing unit and applied to regulate the flow of water. The sensors suggest moisture in terms of voltage.

The solenoid valves in the pipe will open for specified time and then automatically locked.

V. A. Jane [18] et al in 2018 said that, the use of advanced techniques in agricultural sector will help to visit and safeguard the crops with less man power. In this paper, an architectural model is introduced to improve the automatic observing of the farms. This is designed to collect weather related data like temperature, rainfall, humidity etc., through different sensors and the images of the leaves with the help of drones. Also, this system will help to predict the intensity and spreading pattern of the diseases which are detected through the analysis of the collected data using advanced prediction techniques.

Ashwini B V [19] et al in 2018 said that, This system using WSN and GPRS Module having main aim is that optimize use of water for agriculture crops. Access units are used to transmit data from sensor unit to base station, send command to actuator for irrigation control and supervise data of sensor unit. The consequent section introduces the Bluetooth technology. WSN crop monitoring application is favorable to farmer for exactitude agriculture. Data mining algorithm are applied to take decisions on drip irrigation system. This system having WSN positioned in all over farm and different type of sensors. All statement are vaguely visualized through web application. This system works on Naïve Bayes algorithm for flooding control.

J.Kumar [20] et al in 2019 said that, this paper goals at achieving mechanization for the purpose of plant observing and flooding system, using Node MCU. Sensors are used for observing the environmental conditions surrounding the crop, whose outputs are acquired on mobile as well as uploaded on the cloud. The temperature, humidity and soil moisture can be fetched from anywhere in the world as the data is shared on the cloud platform. A record of this data can be maintained which could be used for the future reference, i.e., in the next cropping season, thereby, enhancing the planning and development of crop production.

R Maskara [21] et al in 2019 said that, in this paper, through SIS is very encouraging, it does not get popularity due to given two challenges: -As the intelligentt irrigation system works in a distance location, providing power to it is very complicated. Due to faraway Installation of this system, the farmer can't track its operation and remain ignorant of the condition of the farm. This system addresses the following challenges. The contributions of the paper are listed: for remote power supply, solar panel based system is introduced. For remote information transformation, an Internet of things (IoT) based solution is proposed. A prototype has been prepared to validate the proposed model.

III. CONCLUSION

From this review the following conclusions are made,

- The flooding System is one of the toughest and time consuming post harvesting operation.
- In today's world due to irrigation there might be some possible wastages. It may be water wastages, crop wastages and so on.
- A few endeavors have been made to motorize the irrigation system. Some of them were physically worked and others were power worked. These instruments have their own preferences and detriments.
- Some of them were problematic, tedious, power expending, uneconomical. There is a need to build up some instrument which would work acceptable and must be affordable.

REFERENCE

[1] A.R.Al-alia, S.Rehman, S.Al-agilia, M.H.Al-omaria, M.Al-fayezia ," IOT –Solar energy powered smart farm irrigation system",Department of Computer Science Engineering, American University of Sharjah, 26666,United Arab Emirates, vol 23, Aug 2001.

[2] Sanyam Agarwal, Arvind Gautam , Pankaj Singh and Rohit Sharma, "A BJT Based Soil Moisture Sensor for Irrigation Monitoring", Bansal Institute of Engineering &Technology, Meerut SDCollege of Engineering &Technology Muzaffarnagar, SRM University, Ghaziabad, vol 2, Jan 2012.

[3] K. Chenna Kesava Reddy, P Venkatrao, "Real Time Field Monitoring and Controlling System", DRK College of engineering and technology, Andhra Pradesh, India, Volume-2, Issue-4, September 2013.

[4] Manish Giri, Department of Computer Engineering MIT Academy of Engineering Alandi(D), University of Pune. Dnyaneshwar Natha Wavhal. Department of Computer Engineering MIT Academy of Engineering Alandi(D),University of Pune, "Automated intelligent wireless drip irrigate on using linear programming", Volume 2, Issue 1, January 2013.

[5] Ms. Jyotsna Raut Department of Electronics & Telecommunication Zeal Education Society's, Prof. V. B. Shere Department of Electronics & Telecommunication Zeal Education Society's DCOER Narhe, Pune, India DCOER Narhe, Pune, India, Volume 5, Issue (4) July, Technovision-2014, ISSN 2249–071X.

[6] S. Harishankar1 , R. Sathish Kumar2 , Sudharsan K.P, U. Vignesh and T.Viveknath Department of Electrical and Electronics Engineering, Amrita University Ettimadai, Coimbatore, India," Solar Powered Smart Irrigation System", ISSN 2231-1297, Volume 4, Number 4 (2014), pp. 341-346.

[7] Veera Samson Janga PG Scholar, Dept of Embedded Systems, Dept of ECE, St Mary's Group of Institute. Raghawa Yathiraju Assistant Professor, Vice Principal, Dept of ECE, St Mary's Group of Institute, "Fabrication of an Intelligent Irrigation Monitoring System Using Wireless Network", Volume No: 2(2015), Issue No: 1 (January) January 2015.

[8] K Nilson1,G Sharmila2 , P Praveen Kumar3 2Assistant Professorand1,3UG scholars,Dr. Navalar Nedunchezhiyan College of Engineering Cuddalore, Tamilnadu India," Intelligent Auto Irrigation System Using ARM Processor and GSM", VOL 01, 02 - April – 2015, ISBN 978-81-929742-6-2.

[9] Prashant B. Yahide, Prof. S.A.Jain, Prof. Manish Giri Department of Computer Engineering, MIT Academy of Engineering, Alandi Pune, India," Survey On Web Based Intelligent Irrigation System In Wireless Sesnsor

Network", Multidisciplinary Journal of Research in Engineering and Technology, Volume 2, Issue 1.
[10] Prof. Rashmi Jain, Shaunak Kulkarni, Ahtesham Shaikh, Akash Sood. Dr. D. Y. Patil Institute of Engineering and Technology, Pimpri, Pune –411018 Department of Electronics & Telecommunication Engineering,"Automatic Irrigation System For Agriculture Field Using Wireless Sensor Network (Wsn)", Volume: 03 Issue: 04 | Apr-2016.
[11] Yogesh.G,Gawali,Devendra.S,Chaudhari,Hidentra C," A Review On Automated Irrigation System using Wireless Sensor Network ",Volume 5, International Journal Of Advanced Research In Electronics And Communication Engineering (IJARECE),2016.
[12] Ms Shwetha P.S,Student ,Department of Information Science, NIE Institute of Technology, Mysuru, India," Survey On Automated Irrigation Systems Using Wireless Sensor Networks", Volume: 03 Issue: 04 | Apr-2016.
[13] Sujatha dasgupta,mit patel," Review of solar operated automated irrigation system ",volume 1, International journal of engineering research in mechanical and civil engineering ,2016.
[14] Avinash Chitransh1, Akash Sagar2, Amit Kumar3 1UG Student Galgotia's College Of Engineering and Technology, Greater Noida, UP, India," Automated Solar Powered Irrigation System A Technical Review", Volume:03Issue:04|Apr-2016.
[15] Dr.S.JothiMuneeswari,Merlin,Janet.E,Rajeswari,G. Selvarani,"Smart Irrigation System Using IOT Approach", International Journal Of Engineering Research & Science (IJOER),volume 3,2017.
[16] Jia uddin, S.M. Taslim reza, qader newaz, jamal uddin, touhidul islam, jong-myon kim1 Department of Electrical and Electronic Engineering, International Islamic University Chittagong, Chittagong, Bangladesh," Automated irrigation system using solar power",volume 17,2017.
[17] Alok Gora1* And M.S. Dulawat2 Department Of Agricultural Engineering, C.P. College Of Agriculture, SDAU, SK Nagar, Gujarat, India," Review On Solar Powered Smart Irrigation System-An Innovative Concept", Vol. 5(6), 15-19, June (2017).
[18] V. A. Jane S. Sathyapriya Research Scholars & Dr. L. Arockiam Associate Professor Department of Computer Science St. Joseph's College, Tiruchirappalli," IoT Based Architecture for Agricultural Farm Monitoring", Vol. 20, December 2018.
[19] Ashwini B V,Assistant Professor Dept of ISE Brindavan College of Engineering Bangalore, India," A Study On Smart Irrigation System Using IOT for Surveillance of Crop Field",vol 7,2018.
[20] J.Kumar,N.Gupta,A.Kumari, Dept. of Electronics and Dept. of Electronics and Communication Engineering, National Institute of Technology Jamshedpur, Jamshedpur, India," Automatic Plant Watering and Monitoring System using NodeMCU",vol 2,2019.
[21] Ritesh Maskara, Nikhil Maskara, Shuvabrata Bandopadhaya, "Solar System Powered Iot Solution for Smart Irrigation". Asian Journal For Convergence In Technology,(AJCT).Retrievedfrom,http://www.asianssr.org/index.php/ajct/article/view/746,volume5,2019.

