TEST Engineering & Management

January - February 2020
ISSN: 0193 - 4120 Page No. 14932 - 14935

Smart Monitoring and Control of Chicken Barn Climate and Hazardous Volatile Compounds using Iot

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Article Info
Volume 82
Page Number: 14932 - 14935
Publication Issue:
January-February 2020

Article History
Article Received*: 18 May 2019*
Revised*: 14 July 2019*
Accepted*: 22 December 2019*
Publication*: 28 February 2020*

Abstract
The chicken industry is the largest component in the farming industry in India. It is among the main contributors to the sources of nutrition in India. The chicken's barn condition is to be ideal for better growth rate of animal. The proposed work is to observe and control continuously the humidity, temperature and hazardous compound inside in the barn that will ensure good mammal growth. The environmental parameters inside the barn are observe by using Controller consisting of temperature, gas and humidity sensors which measure the data in real time. The collected information from the nodes transmitted to a web page via IOT. This will enable to observe an early condition of unusual barn environment to ensure better mammal growth..

Keywords: *Chicken barn climate, Hazardous volatile compounds, IOT, GSM module.*

I. INTRODUCTION

To develop a Smart Phone with cloud based real time monitoring of chicken farming and finding solutions for chicken barn use Arduino Uno. An experiment and systematic observation and analysis of the system were applied in a sample chicken farm. The system observes local weather conditions, which including temperature, humidity, climate and also we can control the switch with respect to filter fan in the chicken farm. This system is comfortable for farmers in farm management and used to effectively control the farm from anywhere in globe at any time, which results in cost reduction, raw material saving, and productive management in chicken farming.

The objective of this system is to observe and control the humidity temperature, and hazardous compounds inside in the barn to ensure animal growth. The entire system is observe and controlled by using IOT technique.

II. EXSITING SYSTEM

In this system, the prototype is developed using Zigbee technology. Collected information will be shared via communication link using Zigbee to a microcontroller board. The collected Information from the nodes will be shared to web page via cloud and General Radio Packet Service (GPRS). The same data will be shared to farm Manager mobile phone through short messaging system (SMS) only for shorter distance.

III. PROPOSED SYSTEM

This System helps to implement the control facility. In this project, the Zigbee Technology is replaced by Cellular Technology. It can optimize the Barn condition autonomously using a PID Controller or can also be observe with the web interface.

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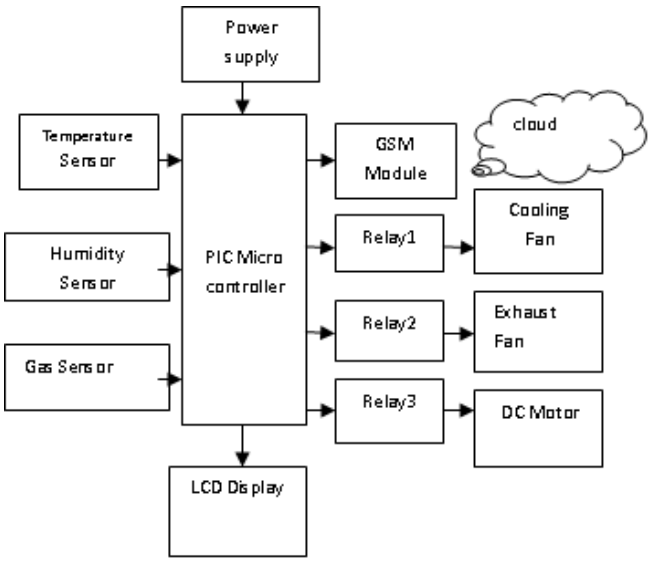
January - February 2020
ISSN: 0193 - 4120 Page No. 14932 - 14935



IV. PROPOSED METHODOLOGY

PIC has been used as controller and SIM800C is used as GSM module. LM35 can be used as temperature sensor, which will be used for observe the local farm temperature and shares the information to the microcontroller, which can send the real time values and perform action based on the information in LCD display after analysis.

The temperature reaches the above threshold value, the Relay1 gets switched ON, and automatically cooling fan will make it ON to control the internal temperature. The threshold value of temperature is 40 degree Celsius. Once, the temperature is below the threshold value, the Relay1 gets switched off and then cooling fan will be automatically turn OFF.

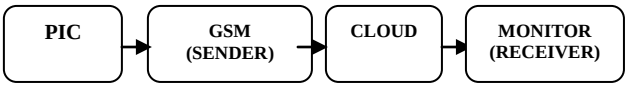
Similarly, capacitive type humidity sensor can be used to observe the environmental humidity and shares the information to the microcontroller which can sense the data received and carry out action based on the real time data of humidity in a poultry farm. When humidity goes above the threshold value, then control that humidity, the Relay2 gets switched ON after that Exhaust fan will be automatically ON. While the internal humidity of poultry farm is under control, Relay2 is switched OFF and fan will automatically turn OFF.

MQ2 is used as gas sensor to monitor the ammonia gas (NH3) in the air of farm from various gases available like Hydrogen, CO, NH3 and even methane etc,. Because, ammonia gas affects the improve growth of the chickens in farm industry, it will leads to several diseases like Bird Flu, Hand Foot disease and Mouth disease etc,. The threshold limit of ammonia is considered as 40%. The percentage of ammonia gas in air in farm is goes above the threshold limit, which is fixed in a system, then to control the percentage of ammonia in air, the same Relay2 gets switched ON and the Exhaust Fan will be ON. Once, the ammonia gas in poultry environment is under control, the Relay2 is switched OFF and fan will automatically turn OFF.

Water level control mechanism for a poultry farm has been designed. .DC Motor is used to supply the water .It has been able to supply water to the chickens as per the requirement. Here the timer is used to switch ON the relay. So water should not get waste and health of the chicken will automatically monitor.

Based on the timer, Relay3 gets switched ON and the water is supplied for the bird based on the requirement.

All the Statistical values will be display on the LCD. The various values like farm temperature, humidity and ammonia gas will improve workers of poultry farm industry to know the details of local environment of poultry farm by seeing the various parameters displayed in LCD Display. Acquired values of all the sensors are uploaded to the web page. The farm in-charge can see these data to their Smart Phone or personal computer using internet and IoT from anywhere.



V. RESULTS AND DISCUSSION

Here, we proposed a methodology to monitor humidity, farm temperature, hazardous compounds and water level in a poultry farm to ensure animal growth. This work has been implemented is done with the help of PIC micro controller and wifi module. It is used for organizing the data using a Google spread sheet. This method can be further applied in applications involving remote monitoring of various physical parameters. All sensor values will be uploaded in real time to web page using IoT. The person in-charge of poultry can see

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these details through mobile phone or laptop. Result of this system is shown below

OUTPUT DATA

LogID	Temperature	Humidity	Gas 1	Gas 2	Logdate	LogTime
1	030	000	000	000	04/07/2018	10:25:33
2	030	000	000	000	04/07/2018	10:27:29
3	030	001	000	000	04/07/2018	12:43:48
4	030	000	048	000	04/07/2018	12:45:44
5	030	000	000	000	04/07/2018	12:57:55
6	030	176	000	000	04/07/2018	12:59:51
7	030	188	003	000	04/07/2018	13:01:49
8	039	188	000	003	04/07/2018	13:03:46
9	030	158	000	000	04/07/2018	13:13:02
10	047	131	000	000	04/07/2018	13:15:09
11	030	126	142	000	04/07/2018	13:17:06
12	030	190	128	136	04/07/2018	13:19:03
13	030	190	137	112	04/07/2018	13:20:59

OUTPUT DATA

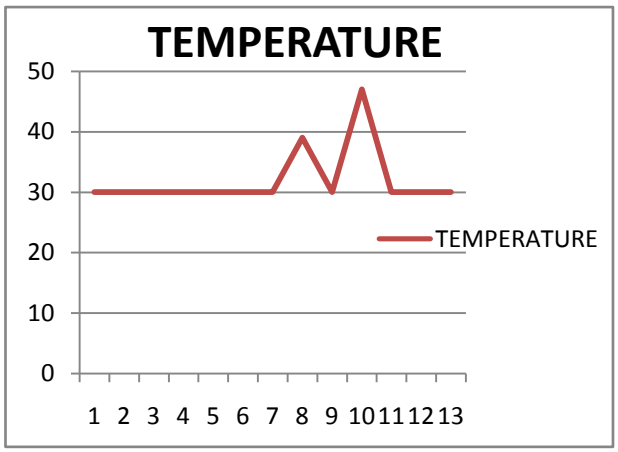

Fig1 TEMPERATURE GRAPH

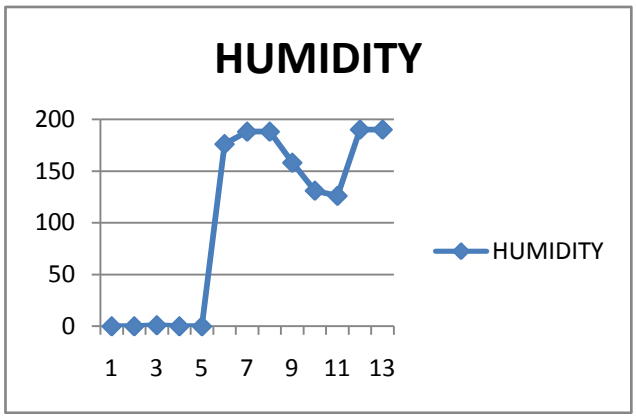

Fig2 HUMIDITY GRAPH

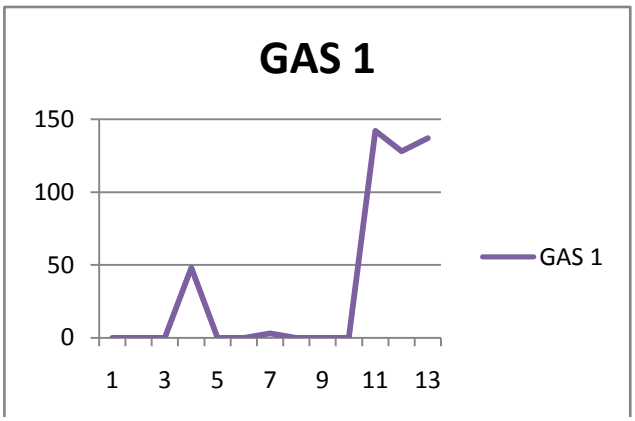

Fig3 GAS1 GRAPH

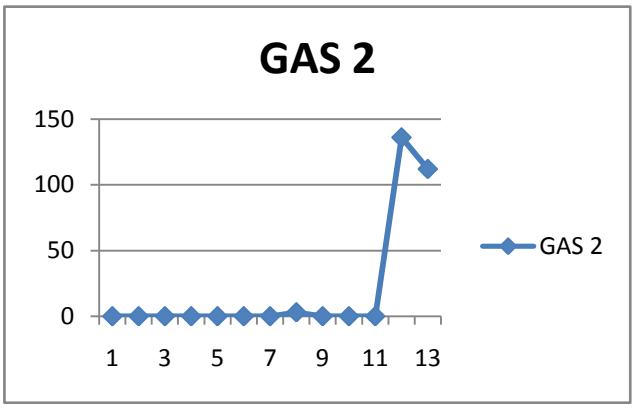

Fig.4 GAS2 GRAPH

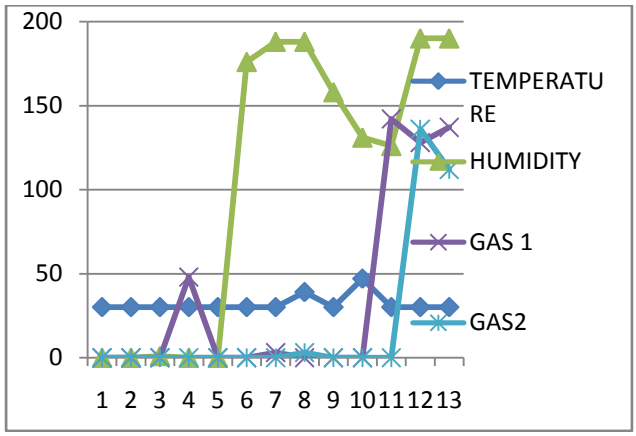

Fig5 TOTAL GRAPH

CONCLUSION AND FUTURE SCOPE

IOT is an innovative technology for poultry farming which can be changes a traditional farm into modern automated poultry farm. Various environmental parameters have been continuously monitored to improve health and growth of the chicken. Water control

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mechanism helps to provide time to time water supply to the chickens as well as help to avoid the wastage of water. Application of IoT helps the farmer to monitor the environment inside the poultry farm. Hence owner can able to get all details of the poultry at anytime and anywhere.

Our proposed work can be extended by automating the disposal of waste and automatically detecting the diseases of birds by monitoring the weight of the bird.

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