

DEPARTMENT : BIO MEDICAL ENGINEERING

YEAR : THIRD YEAR

TOPIC : FLOOD MONITORING AND ALERTING SYSTEM

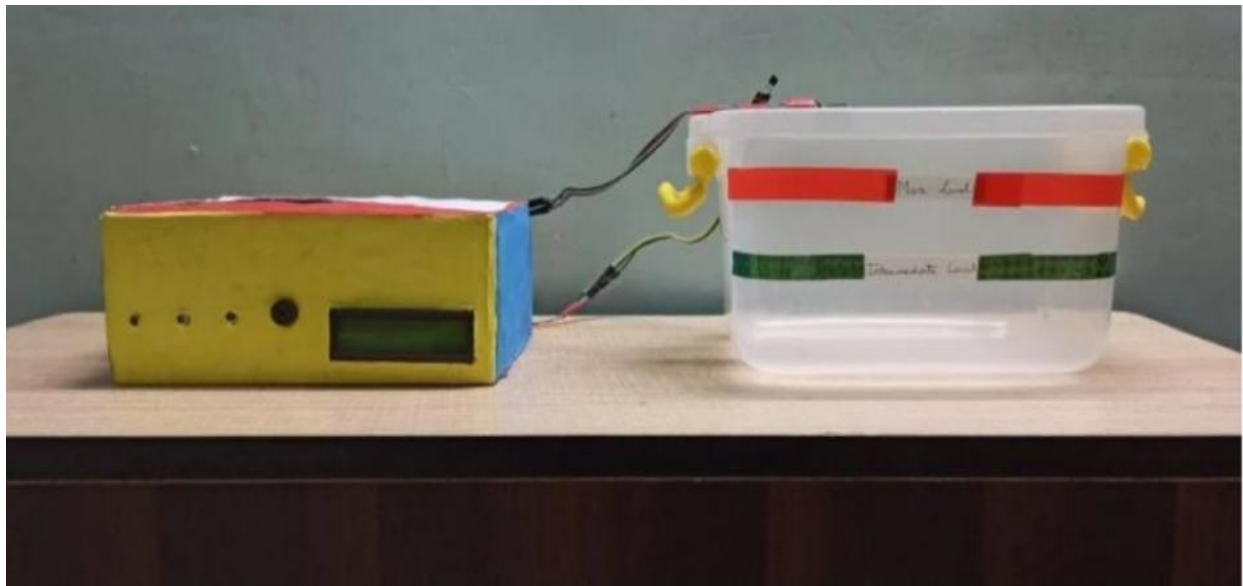
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By :

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Flood Monitoring And Alerting System



As we all know that Flood is one of the major well know Natural Disasters. When water level suddenly rises in dams, river beds etc. A lot of Destruction happens at surrounding places. It causes a huge amount of loss to our environment and living beings as well. So in these case, it is very important to get emergency alerts of the water level situation in different conditions in the river bed.

The purpose of this project is to sense the water level in river beds and check if they are in normal condition. If they reach beyond the limit, then it alerts people

through LED signals and buzzer sound. Also it alerts people through Sms and Emails alerts when the water level reaches beyond the limit.

The composition of the Flood warning System ;

The warning System includes:

1. **Wireless Sensor network** capturing relevant variables about the flow of rivers and streams (level.flow.speed, water Temperature, etc)
2. **A smart computer System** for the exploitation of hydrometeorological and notifications for events that may involve a Flood risk situation.

Real -time Monitoring

ENVIRA IoT's System controls the flow and its behavior in real time,detects possible water courses and alerts about the flood risk with real and accurate data.it includes autonomous stations located at strategic points, equipped with adatalogger that reads the data captured by the Sensors, Besides the Sensors for the level of watercourses, Sensors for Temperature and humidity,turbidity,water speed, capacity,etc.can be installed.

A series of determinants identifying and predicting a certain event can be defined for each station, with the purpose of sending a warning to the control center and to the users predefined from the beginning.

These meters include a radar Sensor with a Maximum range from 10 to 70 meters. This technology enables independent measurments of the environmental contactless Monitoring principle,there is an absence of wear and maintenance.

Warning System;

Acquisition and communication Electronics continuously control the level of water and the delivery of data to the control center at planned intervals.

If a present level or flow is surpassed, it generates data communication through SMS or e-mails to the authorized users.

The solution can be integrated with the early flood warning System (EFWS) of public Administration.

Things used in this project-

Hardware component-

1. Bolt-IoT wifi module
2. Arduino uno
3. Breadboard-400 tie points
4. 5mm LED:(Green, Red, Orange) and Buzzer
5. 16×2 LCD Display
6. LM35 Temperature Sensor
7. HC-SR04 Ultrasonic Sensor
8. Some Jumper Wires
 - Male to Female jumper Wires-15 pcs
 - Male to Male Jumper Wires-10 pcs
 - Female to Female Jumper Wires-5 pcs

9. 9v Battery and Snap Connector

10. USB Cable Type B

Hand tools and fabrication machines

1. Electrical Tape
2. Green Cello Taps

STEP:1 Connecting 5v and GND of Arduino to the Breadboard for Power connection to other components

STEP:2

. Connecting LED's



For Green LED

- VCC of Green Colour LED to Digital Pin '10' of the Arduino.
- GND of Green Colour LED to the GND of Arduino.

For Orange LED

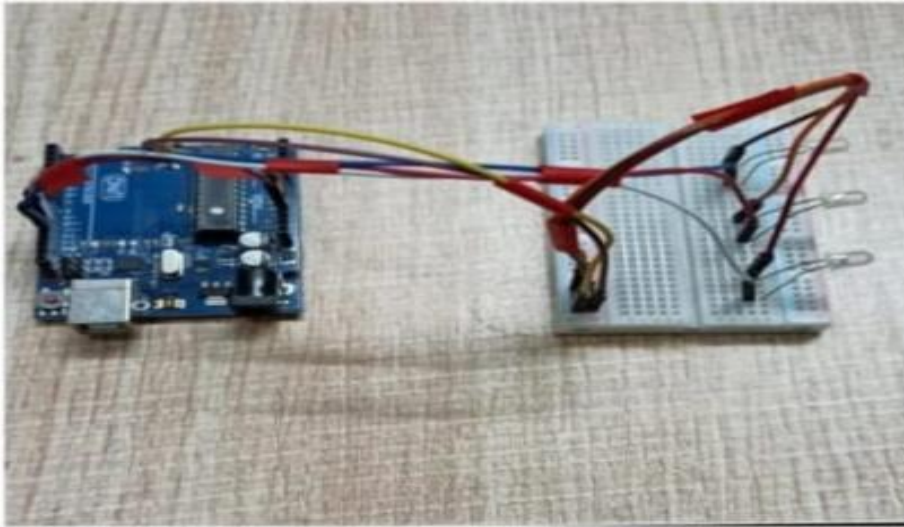
- VCC of Orange Colour LED to Digital Pin '11' of the Arduino.
- GND of Orange colour LED to GND of Arduino.

For Red LED

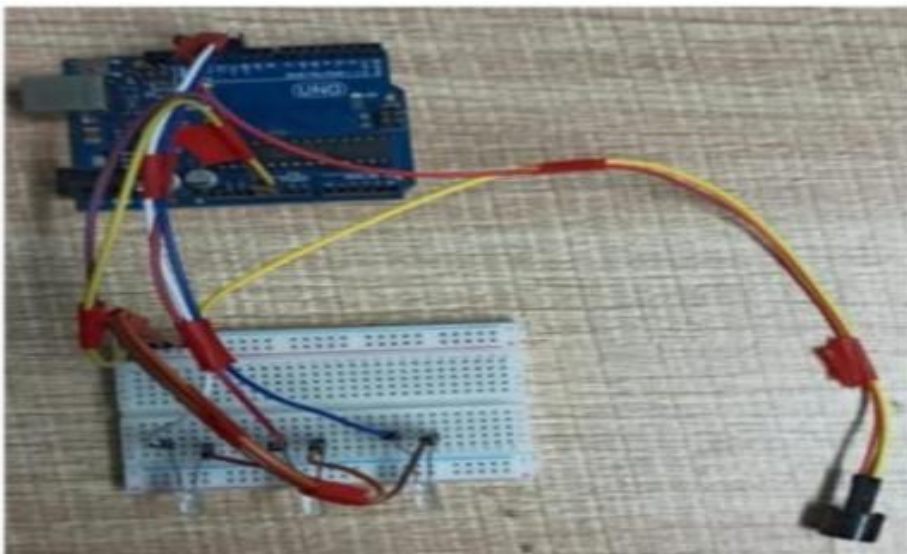
- VCC of Red colour LED to Digital Pin '12' of the Arduino.
- GND of Red Colour LED to the GND of Arduino.

STEP:3

Connecting Buzzer



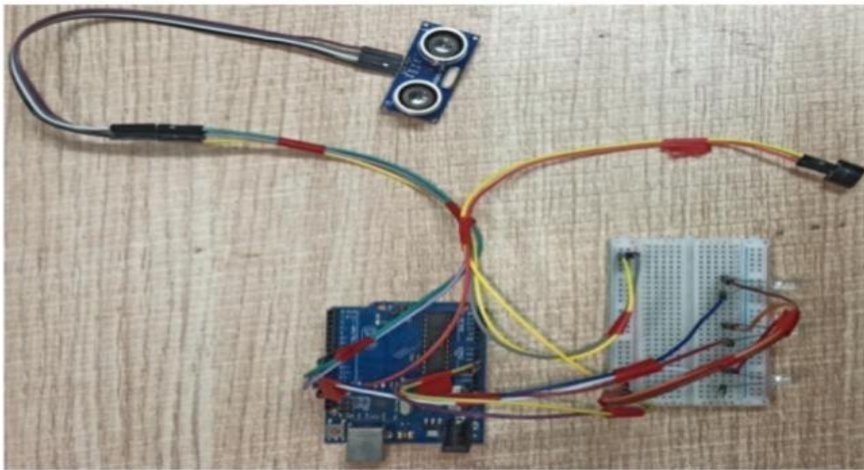
- VCC of Buzzer to Digital Pin '13' of the Arduino.
- GND of Buzzer to the GND of Arduino.



STEP:4

. Connecting HC-SR04 Ultrasonic Sensor

- VCC of Ultrasonic Sensor to 5v of Arduino.
- GND of Ultrasonic Sensor to GND of Arduino.
- Echo of Ultrasonic Sensor to Digital Pin '8' of Arduino.
- Trig of Ultrasonic Sensor to Digital Pin '9' of Arduino.



STEP:5

Connecting Bolt WiFi Module

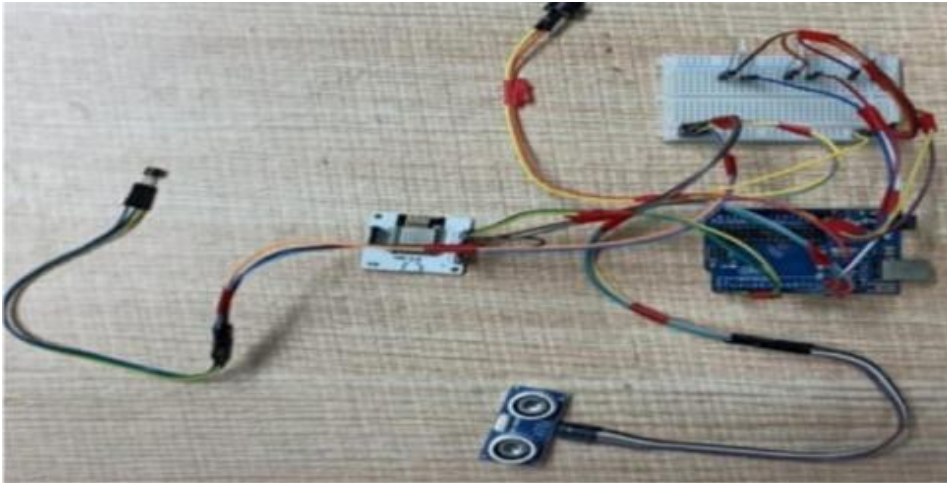
- 5v of Bolt WiFi Module to 5v of Arduino.
- GND of Bolt WiFi Module to GND Arduino.
- TX of Bolt WiFi Module to RX of Arduino.
- RX of Bolt WiFi Module to TX of Arduino

STEP:6

Connecting LM35 Temperature Sensor

- VCC of LM35 to 5v of Bolt WiFi Module.
- Output Pin of LM35 to Pin 'A0' of Bolt WiFi Module.

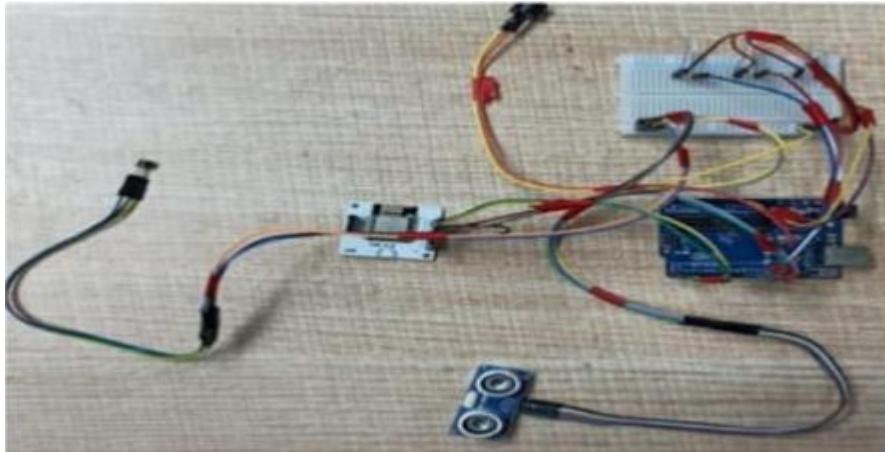
- GND of LM35 to GND of Bolt WiFi Module.



STEP:7

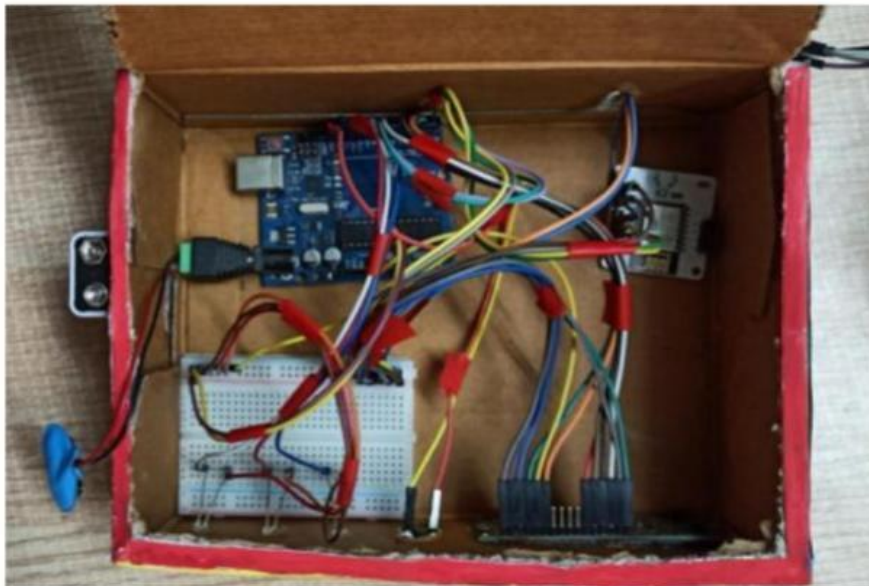
Connecting 16×2 LCD Display

- Pin 1,3,5,16 of 16×2LCD to GND of Arduino.
- Pin 2,15 of 16×2LCD to 5v of Arduino.
- Pin 4 of 16×2 LCD to Digital Pin '2' of Arduino.
- Pin 6 of 16×2 LCD to Digital Pin '3' of Arduino.
- Pin 11 of 16×2 LCD to Digital Pin '4' of Arduino.
- Pin 12 of 16×2 LCD to Digital Pin '5' of Arduino.
- Pin 13 of 16×2 LCD to Digital Pin '6' of Arduino.
- Pin 14 of 16×2 LCD to Digital Pin '7' of Arduino.

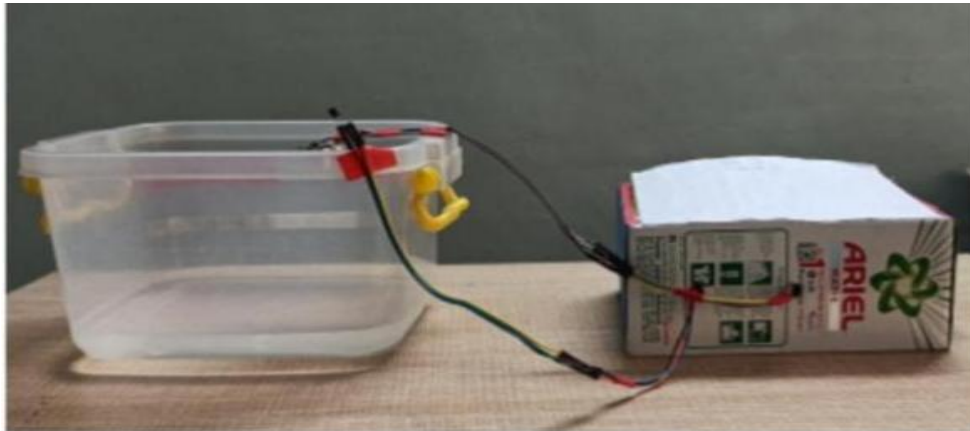


After doing the hardware connection put all the hardware components in one box .

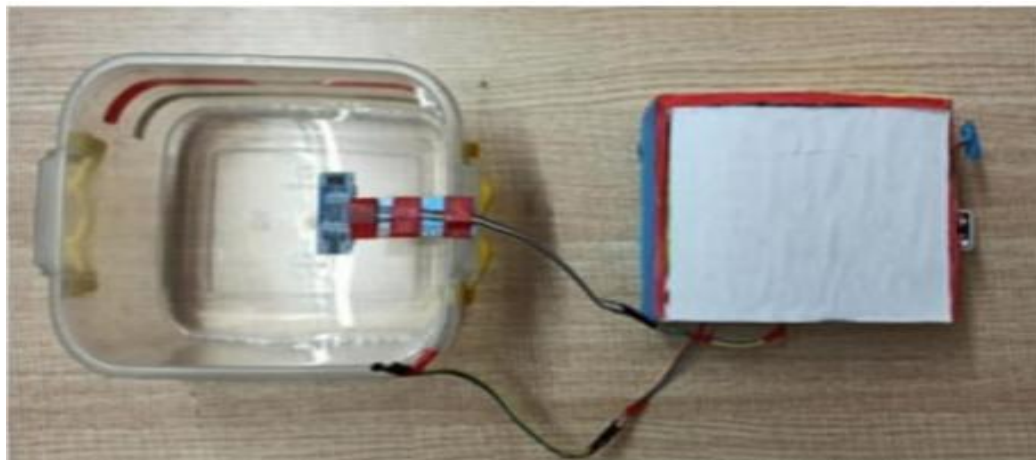
Also attach LM35 Temperature Sensor on the side of the container.



Also attach Ultrasonic Sensor on the top of the container.



Also attach Ultrasonic Sensor on the top of the container.



PROBLEM STATEMENT

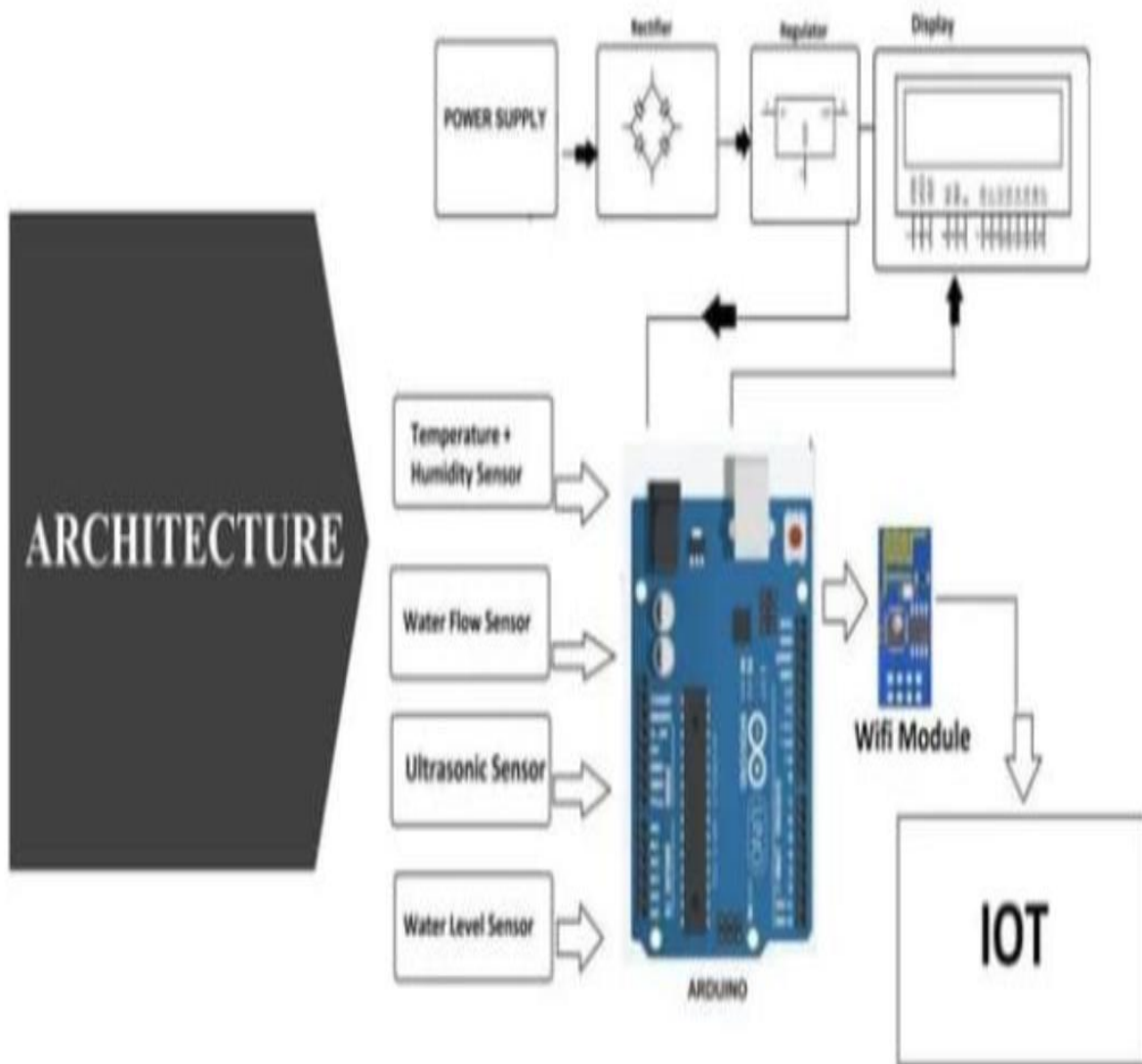
- Many flood warnings stations have been developed and installed in prosperous countries but the manufacturing cost is usually too high to be practical in developing countries.
- Therefore, building an efficient flood warning System while maintaining reasonable production cost has been a meaningful mission for many researchers including our project.

SCOPE OF THE PROJECT

- Historical records have shown that Flood is the most frequent Natural hazards, accounting for 41% of all Natural perils that occurred globally in the last decade.
- In this period alone (2009 to 2019), there were over 1566 flood occurrences affecting 0.754 billion people around the world with 51,002 deaths recorded and damage estimated at ₹371.8 billion. Put

in context, these statistics only account for “reported “ cases of large scale floods.

- The ultimate goal was to improve the prediction accuracy, for this purpose some researchers have explored the correlation among weather features and prediction accuracy and tried to find the best combination of those features to tune the performance.
- Few researchers on the other hand worked to train the mining Technique well to achieve the high accuracy in prediction. Few have compared the modern techniques with the conventional ones.



- The LCD is used to display the real time values of the Sensors. These data can also be viewed on the cloud, which constantly retrieves the information from the remote IOT platforms.

- If the values of ant Sensor crosses over a certain threshold values, an alerts is send to the end user via the WiFi module. Using this system, the flood related parameters can be monitored from anywhere in the world remotely.
- **In** this system we make use of an Arduino with Sensors to predict flood and alerts respective authorities and sound instant alarm in nearby villages to instantly transmit information about possible floods using IoT.
- **All** these features provided by the application can be efficiently used by any individual to monitor the system. It is user friendly and avoids complications of different data used as the useris only provided with what really is important.