Smart Drainage Monitoring System With Weather Forecasting And Rain Water Harvesting

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Abstract: Rising incident on road in monsoon season increase in India. The purpose of this study is to find the actual place where this scenario occur frequently. Using a cross-sectional analyzed the incident of rain water collection on lower surface of road. The use of barrier control and GSM module was found to play great role in solving the problem. Also employing an underground water discharge channel to control over water. This study definitely answers the question regarding road incident alert to public on time

Index Terms **- GSM module, Arduino, water level sensor, servo motor**

I. INTRODUCTION

Floods are arises by many factors or a combination of any of these generally continuing heavy rainfall, highly accelerated snowmelt, severe winds over water, unusual high tides, tidal wave, or letdown of dams, holding ponds, or other structures that retained the water. Overflowing can be exacerbated by increased amounts of water-resistant surface or by other natural risks such as wildfires, which decrease the supply of vegetation that can captivate rainfall. Here we are mainly focus on rain water collected on roads and how we can solve it. Solution for water logging problem in rural areas which can create serious water flood. Using water control using underground water discharge channel in this project we can solve this kind of problem for people Water is important to life, for both plants and all living creatures, however, it can be very disturbing when it flows. When residential property experiences drainage issues, water can be a nuisance and actually cause a great deal of damage. Different drainage problems, including pooling, saturated soil, and even undirected downspout water, can terminate reforming and turn a backyard into a slough. It creates moisture and mold problems and can damage home foundations; drainage is a serious once when there is a problem. Drainage systems must be improved or installed by drainage system companies or a homeowner will end up dealing with getting worse problems as time goes on.

The method and system provide a present physical geographic location for such network devices in the flood event and /or a user of the network device in an emergency situation such as medical team, rescue team and forwarding the current physical geographic location. Where poor drainage is a problem, drainage system companies can resolve the issue with the right drainage system plan that will move water away from homes and yards, so flooding is less of a problem. Various techniques can undertake this, so knowing which is best for certain section of lawns or disguising requires experienced drainage system services. Several Flood causes really large number of losses in every country, but due to India's extremely high population density and often under development standards, a large amount of damage and many deaths occurred. In India flood due to excessive rain which then results in overflow of rivers, lacks and dams, which adds to cause large amounts of damage to people's lives and property. Nowadays conventional method based on manual basis and it is used for collection of rainwater from road. By considering this all such scenario conventional method cannot fulfil such problem and this project is actual and eco-friendly to sort out the problem of water logging.

II. LITERATURE REVIEW

This project represents the implementation and design functions for monitoring and managing underground drainage system with different approaches. [1] It also gives a description of water wise system and detection method to detect leakage defects in sewer pipeline. Also, some part of condition rating model founder ground Infrastructure Sustainable Water Mains and Intelligent system for underground pipeline assessment, rehabilitation and management are explained.

Drainage system monitoring plays an important role to keep city clean. In fact, not all areas have drainage monitoring team. [2] It leads to irregular monitoring of the drainage condition. The irregular monitoring leads to the blocking of the drainage that imply to the salutation which trigger flood. Manual monitoring is also incompetent. It requires a professionals but they can only monitor very finite and maintain low accuracy. Also sometimes due to lack of knowledge the worker may meets to an accident as they have no idea that how will be the

conditions in those manhole. This paper represents the application and design function of a smart and real-time Drainage and Manhole Monitoring System with the help of Internet of Things

Over flow of sewage on roads is been a major problem in many developed and under developed cities as well. Sewage is generally considered as waste water. [3] There's pones to the complaints is not properly answered or taken into account. A precautionary system is developed where this issue of sewage overflow can be reduced by early sensing of increase in its level. The system design comprises of a sensor to sense the level, a controller to command, a communication network to register the complaints on blockage and continues increase in the level of sewage. A data base is to be maintained to record the data. The system rather simply monitoring the level, it generates alarm signals via complaints to the required departments through mail and SMS regarding prior to overflow.

Rainwater harvesting is collected in the containers before raining down to ground level and collecting it. [4] The rainforest can be used for irrigation, not only for drinking water and livestock, but also for the storage of rocks in the ground. Rainwater harvesting is a method from the roofs of buildings. India gets the most elevated precipitation among nations practically identical to its size. Its landmass has perfect and enduring waterways confusing it – especially through the northern part. In any case, the opposite side of the story is this: some piece of India has kept on encountering dry spell conditions with a disturbing consistency. The waterways have been going away and getting dirtied. The underground water tables are contracting quickly.

A method and system for determining and verifying a location of network devices connected to the Internet of Things (IoT). [5] The method and system provide a current physical geographic location for such IoT network devices and /or a user of the IoT network device in an emergency situation such as an accident, health, fitness , fire , terrorist attack , military incident, weather, flood event, etc. and forwarding the current physical geographic location to legacy 911 network , NG -911 network , a Emergency Services IP networks (ESInet) or text-to -911 Short Message Services (SMS) networks to alert emergency responders.

III. EXISTING SYSTEM

Many research works were carried out in this field but concentration is not given to collection of water on lower surface of roads like under crossing of railway, crossing of small check dam which need to be solve. So the previous system fails to adjust in climate change

IV. PROPOSED SYSTEM

This project represents the implementation and design functions for monitoring and managing underground drainage system with different approaches. The main aim of this machine to solve the problem of water logging, as increase in flood level due to rainwater using GSM module alert is given to people who frequently follow that route. GSM response to receiving an alarm indication from a sensor, the alarm indication indicative of an alert condition threatening lives or property. A Transmitter directly transmits a messaging a liner response to the signal generated by the controller to a remote telecommunication device that is operated by a user. If the water increase to danger level then people with two wheeler try then the safety is the major issue for that barrier control using servo motor plays a major role. If barrier close then people will automatically follow different path. As shown in fig-1.block diagram power supply is giver to the Arduino which is the important component in controlling all the devices. Reed switch is use here as a water level sensor. Three mode is use to indicate the level of water in three different LED color in green, orange and red. Green LED shows minimum level of water which is the normal mode. Orange LED indicate and alert is given to higher authorities some sort of precaution is require to be taken. Red LED indicate the danger signal chances of flood can be arises people should take precaution and not to follow this path kind of alert is given.
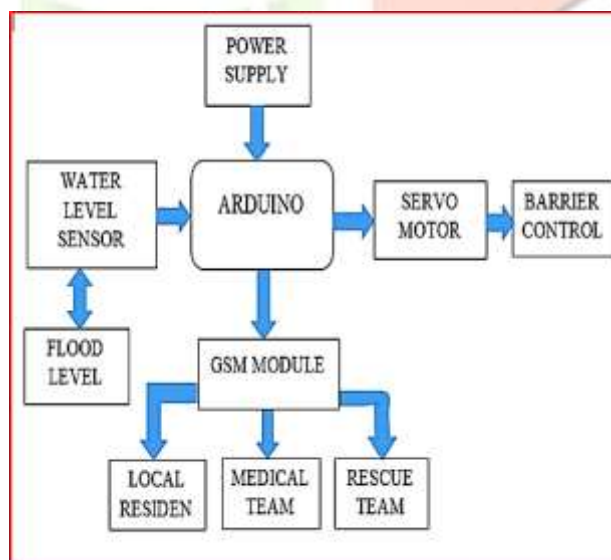

Fig-1. Block Diagram

Fig-2. Hardware working design

3.1Arduino:

As we know that Arduino is most effective component for programming purpose of different component at same time. Whenever there is over water condition there will be a flow detector and a water level indicator which will function as programmed and barrier will be closed for safety of people. Data from weather forecasting department is to be gathered and in case of emergency the same is passed to local residences.
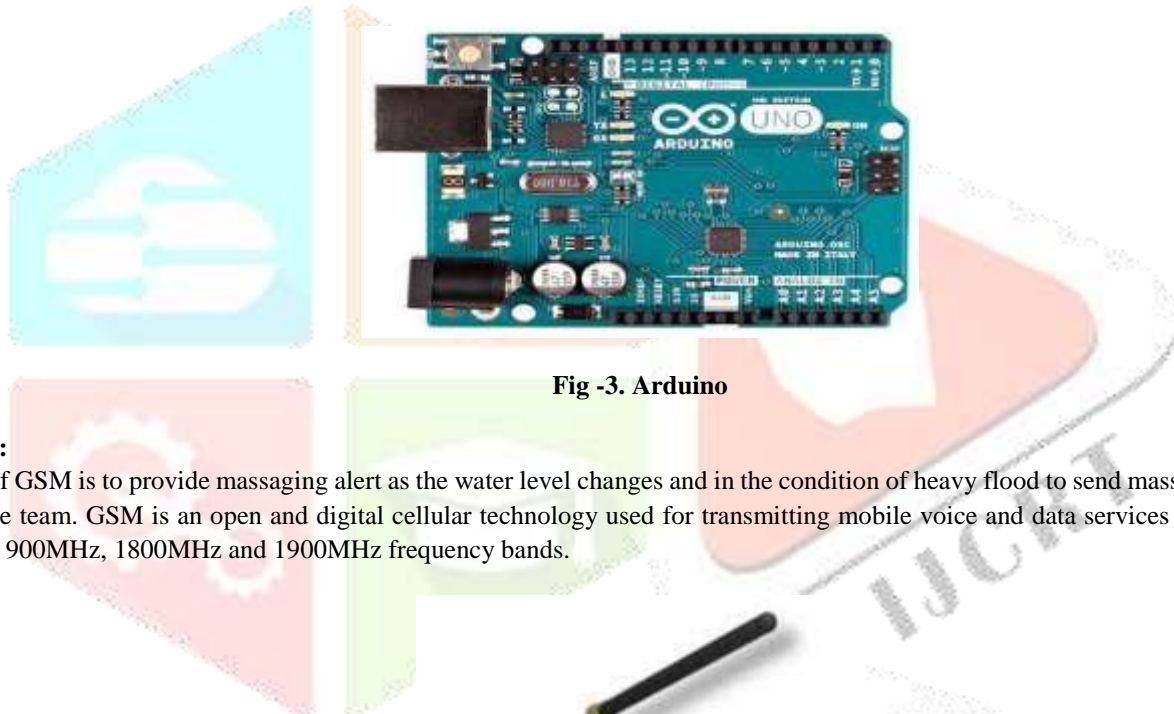

Fig -3. Arduino

3.2 GSM:

The use of GSM is to provide massaging alert as the water level changes and in the condition of heavy flood to send massage to medical and rescue team. GSM is an open and digital cellular technology used for transmitting mobile voice and data services operates at the 850MHz, 900MHz, 1800MHz and 1900MHz frequency bands.

Fig -4. GSM

3.3 Servo motor:

Due to excess flood on road if two wheeler then also try to cross it they get damage and to prevent it we use this motor as a barrier control. A servo motor is an electrical device which can push or rotate an object with great precision. Servo motor can be rotated from 0 to 180 degree, but it can go up to 210 degree, depending on the manufacturing. This degree of rotation can be controlled by applying the Electrical Pulse of proper width, to its Control pin. Servo checks the pulse in every 20 milliseconds.

Fig-5. Servo motor

3.4 Reed Switch:

A normal switch has two electrical contacts in it that join together when you push a button and spring apart when you release it. Rocker switches on wall lights (like the one in the photo up above) push the two contacts together when the switch is in one position and pull them apart when the switch flicks the other way A switch is like a drawbridge in an electric circuit. When the switch is closed, the "bridge" is down and electric current can flow around the circuit; when the switch opens, the "bridge" is up and no current flows. So the purpose of a switch is to activate or deactivate a circuit at a time of our choosing.

Fig-6. Reed Switch

3.5 Voltage Regulator (LM7805)

An easy way to remember the voltage output by a LM78XX series of voltage regulators is the last two digits of the number. A LM7805 ends with "05"; thus, it outputs 5 volts. The "78" part is just the convention that the chip makers use to denote the series of regulators that output positive voltage.
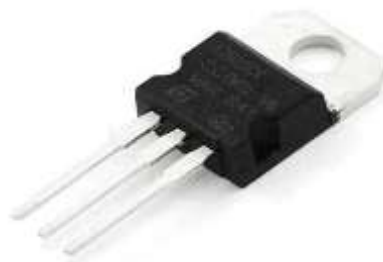
Fig-7. LM7805

V. RESULTS AND DISCUSSION

Table 4.1: Comparison with Previous Methodology

Variable	Papers					
	Paper 1	Paper 2	Paper 3	Paper 4	Paper 5	Paper 6
Rainwater harvesting	Not possible	Not possible	Not possible	Possible	Not possible	Possible
Messaging alert	yes	yes	yes	yes	yes	yes
Number of Component	8	8	4	6	5	6
Weather Forecasting	Not possible	Not possible	Not possible	Not possible	Possible	Possible
Cost	High	High	Low	Low	High	Low

The objective of the proposed project is to provide proper methodology for rainwater collected on low surface of road and with the help of proper discharge channel we send it to ground in very less time. If in any case flood condition raiser give alert messaging for local residence

VI. CONCLUSION

The objective of the proposed project is to provide proper methodology for rainwater collected on low surface of road and with the help of proper discharge channel we send it to ground in very less time. If in any case flood condition raiser give alert messaging for local residence. The main problem of water logging on road is serious issue due to which people find many difficulties in their daily routine and also proper precaution if not taken it leads to harmful bacteria and it favors diseases like malaria, typhoid, cholera, can be solved.

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