FLOOD MONITORING SYSTEM WITH SMS NOTIFICATION

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ABSTRACT - *The main problem in India with respect to floods is inundation, drainage congestion due to urbanization and bank erosion. The problem depends on the river system, topography of the place and flow phenomenon. Flooding occurs when an extreme volume of water is carried by rivers, creeks and many other geographical features into areas where the water cannot be drained adequately. Floods cause extremely large numbers of fatalities in every country, but due to India's extremely high population density and often under-enforced development standards, a large amount of damages and many deaths which could be otherwise avoided. India witnesses flood due to excessive rain which then results in overflow of rivers, lakes and dams, which adds to cause large amounts of damage to people's lives and property. Hence this novel approach is used to monitor and alert floods using Arduino in affecting prone areas.* **Keywords -** Arduino Uno; GSM modem; SMS notification; Solar Panel; Battery; ULN2003 IC.

I. INTRODUCTION

The main problem in India with respect to floods is inundation, drainage congestion due to urbanization and bank erosion. The problem depends on the river system, topography of the place and flow phenomenon. Flooding occurs when an extreme volume of water is carried by rivers, creeks and many other geographical features into areas where the water cannot be drained adequately. Floods cause extremely large numbers of fatalities in every country, but due to India's extremely high population density and often under-enforced development standards, a large amount of damages and many deaths which could be otherwise avoided. India witnesses flood due to excessive rain which then results in overflow of rivers, lakes and dams, which adds to cause large amounts of damage to people's lives and property. Hence this novel approach is used to monitor and alert floods using Arduino in affecting prone areas

A. River flood

A river flood is initiated by heavy rains due to monsoons, hurricanes, tropical storms or snow melts which increases the capacity of the rivers and its tributaries. The possibility of flood can also be the blockage of the water body's natural flow due to mud from landslides and other natural outgrowth. River floods can also occur because of excess clearance of vegetation by human beings in river banks.

B. Flash flood

Flash flood refers to a phenomenon where water level raises rapidly within a short period of time. It is caused by sudden incident of heavy rainfall. Flash flood is a major problem in many countries. There is no proper remedy for this kind of flood as it arises suddenly.

C. Coastal flood

The act of sea water penetration into the domestic area is coastal floods. This may occur due to a situation of low pressure with high tides or storms. In both the cases sea level rises abnormally which causes flooding.

The major flood prone regions in India are Punjab, Haryana, most of the Gangetic plains including Uttar Pradesh, North Bihar and West Bengal, the Brahmaputra valley, coastal Andhra Pradesh and Orissa, and southern Gujarat. This supports the need for early warning and monitoring system of flood water level. The design project is to create a flood water level monitoring system that has an early warning device and can send notifications through SMS using Arduino Uno with solar panel and generator as its power source.

II. PROBLEM IDENTIFICATION

The Main problems in INDIA with respect to floods are inundation, drainage congestion due to urbanization and bank erosion. The problems depend on the river system, topography of the place and flow phenomenon. The catchments of these rivers receive large amount of rainfall.

III. DESIGN METHODOLOGY

The Block Diagram of Arduino UNO Based Flood Detection is as shown in Figure No. 1. The system is constructed through the use of Arduino Uno, GSM modem and ULN2003 IC that will be powered by a ULN2003 IC with Battery. The early warning device will be the three LED that is mounted to a PVC pipe and then the system will send an SMS notification to the people in the community. The

functionality of the system was tested by the simulation of flooding. The results provided that the objectives of the design satisfied the needs of the client.

The system will be using a solar panel with Battery

for the power source of the system. Firstly, the ULN2003 IC will be giving the input signals needed to the Arduino. Secondly, Arduino will analyze the signal and it will be the basis of the current flood water level.

Thirdly, one of the three LED will turn on depending from the readings. Lastly, the GSM shield will automatically send the flood water level to the registered mobile number usingSMS in Real time. Lastly, the GSM shield will send the flood water level to the registered mobile number using SM Sin Real time
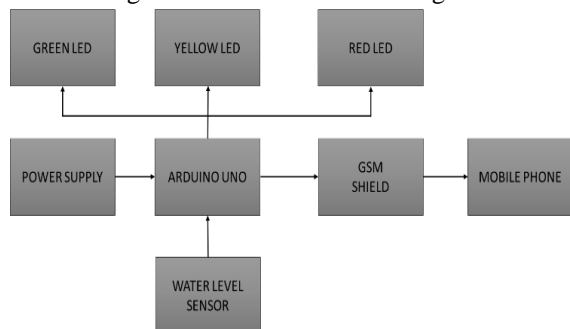

Figure No.1: Block Diagram System

IV EXPERIMENTAL RESULTS

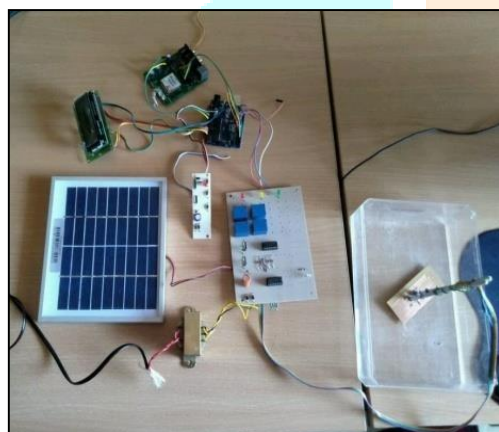The Experimental setup is done as shown in Figure No. 2and the results are concluded as per the Table No. 1.

Figure No.2 : Experimental Setup

Table No.1 : Water level indicators.

Water Level	Indicator	Conclusion
Very High	Green	Dangerous situation
Medium	Yellow	Critical Situation
Low	Red	Normal Situation

VI ADVANTAGES

The following are the advantages associated withFlood Monitoring System
1. Everyone is alerted for flood occurrence and canreact quicker.
2. People are able to retrieve their belongingsneeded before any disaster occurs.
3. People are able to evacuate their homes beforeany destruction occurs.
4. Inexpensive.
5. Doesn't affect the environment around it.

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