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DISASTER MANAGEMENT SYSTEM USING WSN

Shaik Karimunnisa*, D.K .Kavitha
* M.Tech Student, Dept of ECE, SSN Engineering college, Ongole,Ap.
Associate professor, Dept of ECE, SSN Engineering college, Ongole,Ap.

ABSTRACT

The mankind at present is facing a biggest challenge from natural calamities like floods, Tsunami, hurricanes etc due to several reasons like deforestation, land sliding and global warming. This is a major problem facing by many countries across the globe. We need to introduce an advanced mechanism to face the natural disasters and to reduce the damage caused over it. Using advanced technology helps us to alert the people in coastal areas before the natural calamities so we can protect the mankind and cattle over there. The wireless sensor networks play a crucial role in wireless data transmission and helps very much in this regard. Using Wireless sensor networks we can reduce the disaster effect and can provide the rescue operation immediately. Through this paper our aim is to review technological solutions for disaster management using Wireless Sensor Networks (WSN) via disaster detection and alerting system and search and rescue operations. In traditional networks involves a huge hardware circuitry such as landline and optical cable networks. Later Adhoc networks were replaced by traditional networks, in adhoc networks no centralized node is present and each node forwards the traffic to the neighbouring node. Huge traffic congestion is a backdrop for adhocs networks. Hence we go for Wireless Sensor Networks (WSN). The proposed system contains three nodes called sensing node placed in ocean, intimating node nearby coastal areas and coordinating node placed in base station respectively. Both sensing node and intimating node sends data signals to coordinating node, the coordinating node sends the data to the base station.

KEYWORDS: Wireless Sensor Networks, Arduino Board, Water float switch, Bluetooth, Buzzer, Button

INTRODUCTION

In early 1970's, the Defence Advanced Research Projects Agency (DARPA) sponsored the earliest wireless ad-hoc networks were called "packet radio" networks. These earliest systems are designed, built and experimented by the Breakneck and Newman Technologies (BBN), Bolt and SRI International. Experimenters included Robert Kahn, Jerry Burchfield and Ray Tomlinson of later TEN-Extended (TENEX), Internet and email fame. In Ham radio community the similar experiments are took place. The original Internet Protocol suite is a motivational part for the early packet radio systems which predated the internet is an interesting to note. In 1980's, Survivable Radio Network (SURAN) project is included into DARPA experiments. In the mid-1990's, another third wave of academic activity started with the advent of inexpensive 802.11 radio cards for personal computers. For military utility the current wireless ad-hoc networks are designed. The natural processes of the Earth which resulting into a major adverse event for a natural disaster; examples include volcanic eruptions, floods, tsunamis, and other geographic processes. A natural disaster can cause property damage or loss of life and typically leaves some economic damage in its wake, the severity of which depends on the affected population's resilience, or ability to recover. The creation of plans through which communities reduce vulnerability to hazards and cope with disasters is the disaster management (or emergency management). Disaster management focuses on creating plans to decrease the impact of disasters instead of avert or eliminate the threads. The damage to assets, human mortality, and lost revenue if any failures occur while creating a plan. In the United States, currently 60% businesses do not have emergency management plans. The acts of terrorism, public disorder, fire, natural disasters (such as earthquakes, hurricanes, etc.), industrial accidents, industrial sabotage, and communication failures are included events which are covered by disaster management. In mounting a humanitarian response to disasters all the local, regional, national, and international organizations are involved. Everything will have a prepared disaster management plan. Prevention, preparedness, relief and

recovery are covered by these plans.

In the past wired network devices were widely used, like landline and optical fiber cable for television and broad band uses. It involves lot of maintenance and cost to maintain the wired networks.

Later wireless networks came into existence and they have lot of advantages compared to traditional wired networks. It is easy to maintain and cost effective.

PROPOSED SYSTEM

The overview of proposed system contains three nodes one is placed in ocean called sensing node, second is placed in nearby costal area called intimating node, third is placed in base station called coordinating node. The overview of the system is shown in fig1.
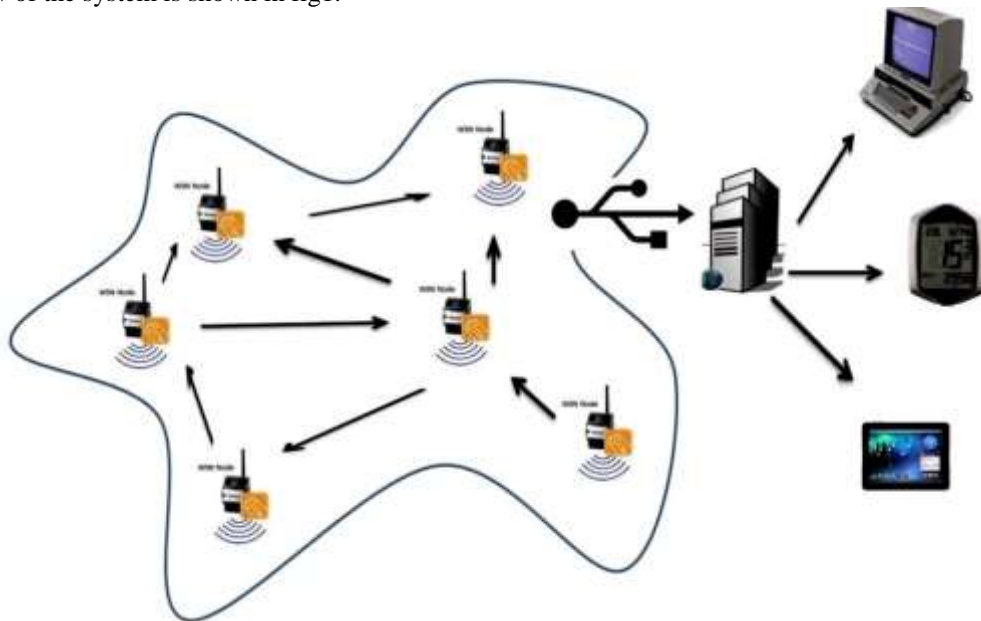

Fig1. Overview of the system

In this project, the Block diagram is divided into three nodes those are

1. Sensing Node
2. Intimating Node
3. Co-coordinating Node

1. Sensing Node:

It has water level sensor and earth quake sensor, ATMEGA328 micro controller and Bluetooth. These sensors sense the earth quake and water level of the sea and these values will be given to the microcontroller which will send this data to the intimating node through Bluetooth. If water level is low it does not send any message and it stops. The sensing node shown in fig2.

2. Intimating Node:

It consists of Arduino, button, Bluetooth. So the information which was send by the sensing node will be transmitted to the intimating node through coordinator node. This type of node is placed at required distance in the coastal area. This is because rescuing the victims in the coastal areas when the area is affected by flood. It the victim can press the button and alert will be send to the coordinator. The intimating node shown in fig 3.
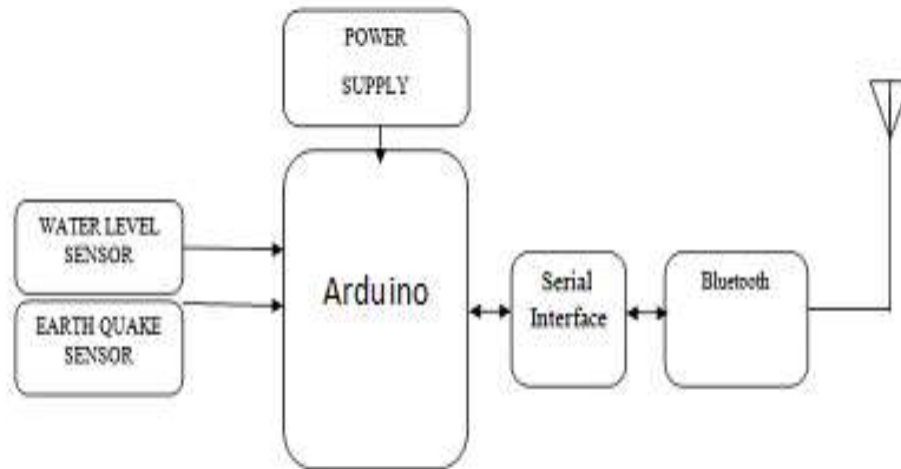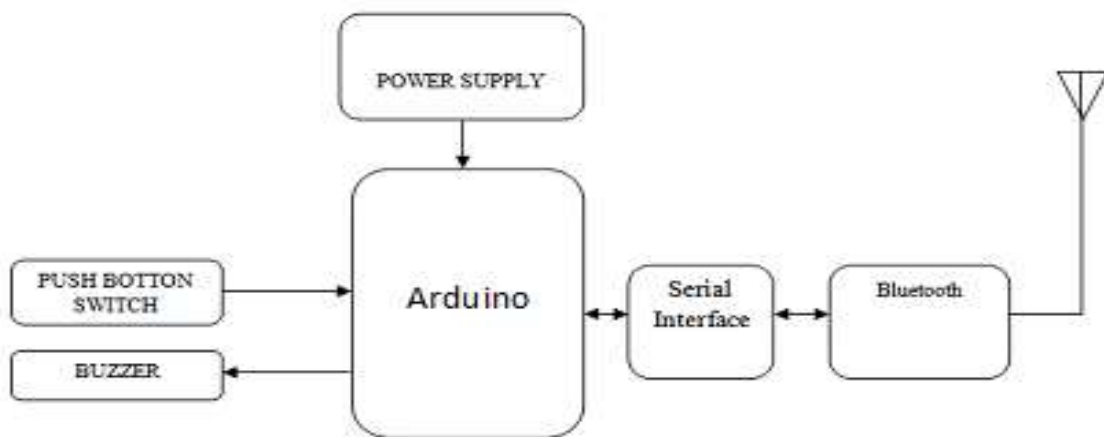
Fig 2 Sensing node

Fig 3 Intimating node

3. Coordinator Node:

It consists of Arduino and Bluetooth. So that it will receive the data from the intimating node. By this data the people in the base station will get an alert and rescue if any problem occurs. The coordinating node is shown in Fig 4.
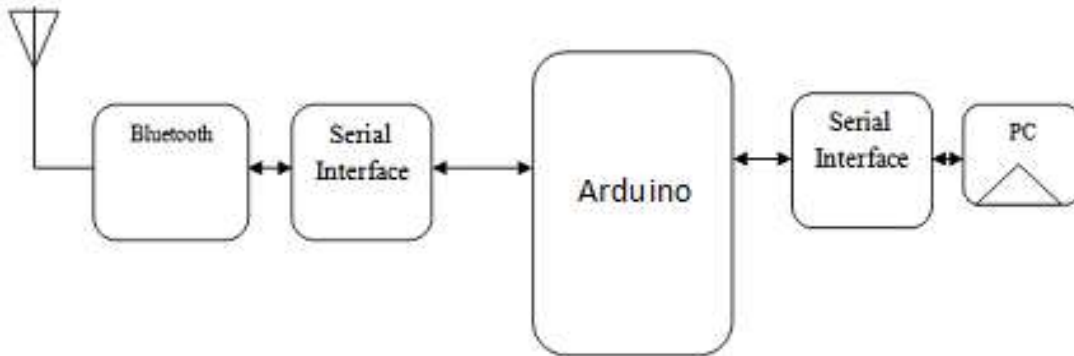
Fig 4 Coordinating node

RESULTS AND DISCUSSION

Fig 5 is sensing node which consists of arduino board, Bluetooth, piezo vibration sensor , water level sensor, 9V battery. The arduino board requires 7V – 12V of power to operate so we are providing externally 9V. Then the water level sensor is connected to the arduino board, it will monitor the level of the water in the ocean and earth quake in the ocean.
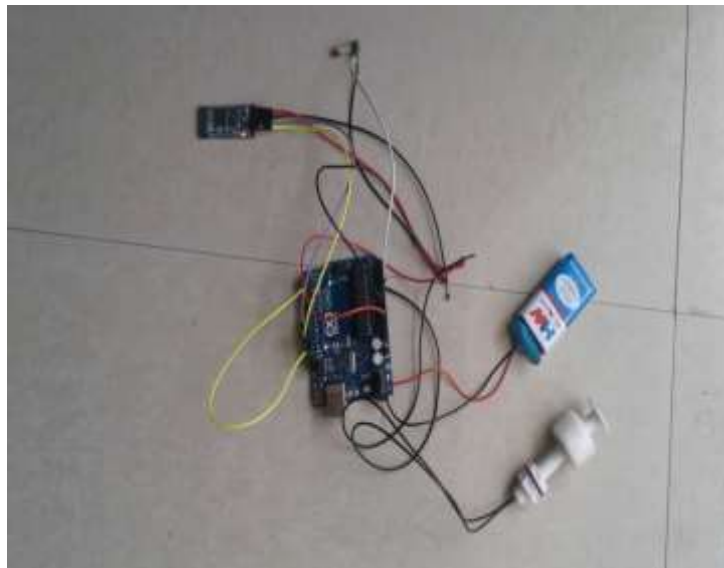

Fig 5 Sensing node

If the water level or vibration in the ocean is increased to maximum level then water level sensor will detects and informs to the coordinator through bluetooth. The read switch present inside of the water level sensor in the middle of that it will sense whenever the water is beyond the read switch.
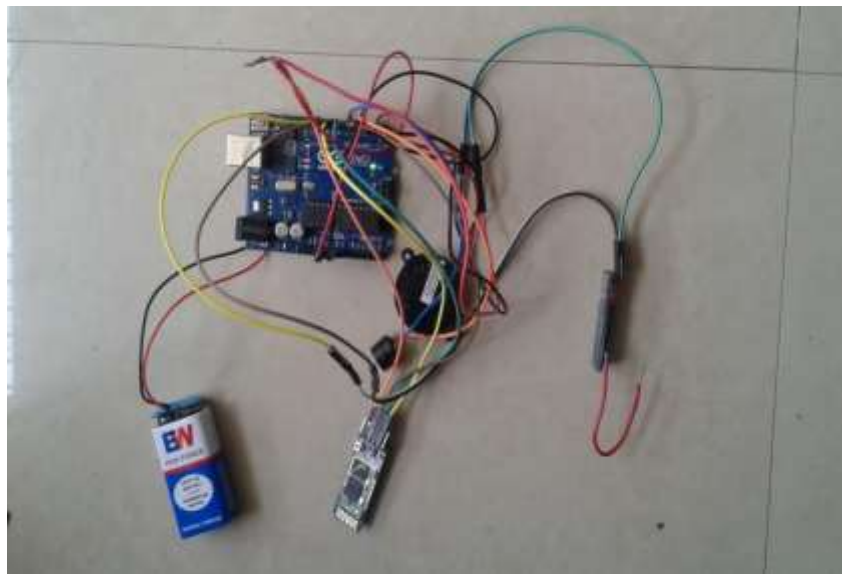
Fig 6 Intimating node

Fig 7 Coordinator node

Fig 6 is the intimating node which is placed near the coastal areas. The sensing node consisting of the Arduino board, Pushbutton switch, battery bluetooth. The main use of this intimating node is after disaster management is called Post disaster management. If any human being is present in floods affected places then the system will detects and informs to the coordinating node to take any rescue operations by press the button and they can inform the message to base station monitoring system. These intimating nodes in the coastal areas we will connect through the mesh network. These all nodes can exchange their data through bluetooth.

Fig 7 is a coordinating node; the main aim of this node is to reduce the traffic between the intimating nodes and sensing nodes. If one or more sensing or intimating nodes are communicating with the base station at a time that time our coordinator will serves the request one by one. If we want to see the communication the coordinator is directly connected PC. These are channel between the all nodes and serial monitoring system. The coordinating node consisting of bluetooth and Arduino board. This will acts as both channel and master control unit. Because it having the capability of differentiating the sensing and intimating messages.

CONCLUSION

This project describes about the implementation of Disaster management system by using wireless sensor networks (WSN).Our system will notify us (End user) by sensing the water level, vibration from the sensing node and it will notify us any human being is present in coastal areas through intimating node automatically. This automation can be done by this methodology. We can reduce the cost, human efforts. We can increase the speed of disaster management and we can reduce loss of property and loss of lives. No satellite communication.

A serial communication is established to inform the water level, pressure and for some rescue operations between the nodes to the coordinator. The data information acquired at the nodes that is sensing nodes is processed in ARUDINO-UNO and same is transformed and interpreted to make available to the intimating node and coordinator.

REFERENCES

[1]. Alexander, D. 2000. *Confronting Catastrophe*. Oxford, U.K.: Oxford University Press.
[2]. Baker, J. C., B. Lachman, D. Frelinger, K. M. O'Connell, A. C. Hou, M. S. Tseng, D. T. Orletsky, and C. Yost. 2004. *Mapping the Risks: Assessing the Homeland Security Implications of Publicly Available Geospatial Information*. Santa Monica, Calif.: RAND Corporation.
[3]. Bruzewicz, A. J. 2003. Remote Sensing Imagery for Emergency Management. Pp. 87-97 in S. L. Cutter, D. B. Richardson, and T. J. Wilbanks (eds.), *The Geographical Dimensions of Terrorism*. New York: Rout ledge.
[4]. Burton, I., R. W. Kate's, and G. F. White. 1993. *The Environment as Hazard,* 2nd Edition. New York: Guilford Press
[5]. Clarke, K. C. 2003. *Getting Started with Geographic Information Systems*, 4th Edition. Upper Saddle River, N.J.: Prentice Hall.
[6]. Cutter, S. L., ed. 2001. *American Hazards capes: The Regionalization of Hazards and Disasters*. Washington, D.C.: Joseph Henry Press.
[7]. Cutter, S. L. 2003. GI Science, Disasters, and Emergency Management. *Transactions in GIS*7(4):439-445.
[8]. DeMers, M. N. 2005. *Fundamentals of Geographic Information Systems,* 3rd Edition. New York: Wiley.

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