A Project/Dissertation Review-2 Report

on

DISASTER MANAGEMENT SYSTEM

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Abstract

The world is a melting pot of disasters every day. These incidents of mass destruction no matter what they say whether natural or man-made disasters cause a significant loss of money, property and lives due to unplanned part of government and administrative structures. Therefore, steps need to be taken to prevent this of these conditions by predicting the causes of this disasters and the provision of emergency and disaster recovery measures it happens. Ad hoc wireless network networks play an important role it is a wireless data transfer infrastructure and can be very complex useful in these situations. Wireless sensor networks use I technology that can trigger an immediate rescue alert surgery to begin, whenever the catastrophe strikes. With this paper our goal is to review management technology solutions disaster using wireless nerve networks (WSN) networks detection and alert system, as well as search and rescue operations. We first discussed the basic construction of potential WSNs be helpful in disaster management and wireless sensor network models can be used for a different disaster conditions. Finally, we suggest how these networks can be successfully in the case of Indians lagging behind in development in the world of basic infrastructure. Climate change around the world increases the risk of catastrophic events climate with increasing intensity, both in terms of conditions personal injury and economic loss. The authorities need you better equipped to deal with these global realities. It works well disaster recovery and warning system can reduce losses health and facilities. In the event of a disaster, another important one matter is a good quality search and rescue program the accuracy, timeliness and safety of both victims as well rescuers. Recently, Wireless Networks (WSNs) have you are old enough to go beyond simple clean monitoring platforms and be one of them permitting technology for early disaster warning systems. The function of WSN event acquisition function can be very helpful and the (near) value of real-time acquisition, for example, natural weather hazards and wildfires and habitats. Figure1 shows a wireless sensor network, in which each cluster in network construction consists of four ad-hoc relay channels [1].

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Acronyms

SENDROM	**Sensor Network for Disaster Relief Operations Management**
EOC	**Emergency Operation Center**
DMS	**Database Management System**

CHAPTER-1
Introduction

According to the statistics, 68% of India's land is prone to drought, 60% to earthquakes, 12% to floods and 8% to cyclones, making India one of the most disaster prone countries in the world, affecting overall 85% of Indian land and more than 50 million people. According to the statistics, 68% of India's land is prone to drought, 60% to earthquakes, 12% to floods and 8% to cyclones, making India one of the most disaster prone countries in the world, affecting overall 85% of Indian land and more than 50 million people.

Our app will have three modules as follows:

Users

1) Can recieve SMS regarding nearby Shelters.
2) 24/7 support system through Helpline Numbers.

Volunteers

1) Can provide support to users via SMS and Call.
2) May keep count of users in their respective shelter and report missing people to Admin.

Admin

1) Updating information of people at respective shelter with photos.
2) Broadcasting Pre-Disaster SMS to all the users.

Sensor Network

1) Using Spot and Rope Detector for Flood Sensing.
2) Using different Routing Techniques for better Sensor Networking.

Formulation of Problem

Collecting and sharing disaster information about damaged area is the most important activity to support decision making in rescue processes. Disaster Management Systems that use Wireless Sensor Networks (WSNs) have received much attention by researchers in the last five years. This interest comes from the increasing number of disasters all around the world, causing the loss of a huge number of lives and properties and on the easy use of these new and cheap technologies. Indeed, WSNs offer an interesting alternative to wired networks when infrastructures collapse, for instance, after an earthquake or a tsunami. In addition, WSN have attractive characteristics, they are known to be auto-configurable, auto organizing, have small volumes, etc. Different environment parameters can be detected by sensors, such as, the atmosphere humidity and temperature useful for detecting forest and building fires, toxic gases caused by an explosion, water level to detect and prevent floods, vibration level to detect chocks and earthquakes and many other data. Sensors can offer additional useful services. For instance, an estimation of the victim number by calculating the number of persons holding Bluetooth devices, a rapid localization of incidents and victims, a fast and wireless communication between sensors, first responders and command centers. Furthermore, multimedia sensors can take useful photos and videos of the affected area and transfer them in real-time to help first responders and decision makers getting a global idea about the current situation. In the following section, we give general descriptions of some disaster management projects that use wireless sensor networks. Some were proposed to manage specific disasters such as earthquakes, landslides, air pollution and healthcare while others can be applied in many scenarios.

Tool and Technology Used

The Tools and Technologies Used are SQL for Database Creation, React for the Web App. We have also used the Python Simulator for showing Routing techniques. We have used Tinkter for Offline Messaging to the users.

We have made a table of accommodation in the user module which fetches data from the SQL database and shows it in the webpage. Then we have used another database maintained by the admin of lost people and shown their details like name, age, photo, etc. to the users. This is done so that users can report if they find someone who was missing.

We have made the site dynamic using the React Framework. It is done so that the Web App can fetch data from the database.

We have also made a network simulator for wireless sensor networks using python to show the routing process by which we will retrieve data from the disaster prone areas.

The database is created in the google cloud platform. First we have initialized a virtual machine. Then we have uploaded an apache nginx server and then uploaded our SQL database in that for using the data from sensor.

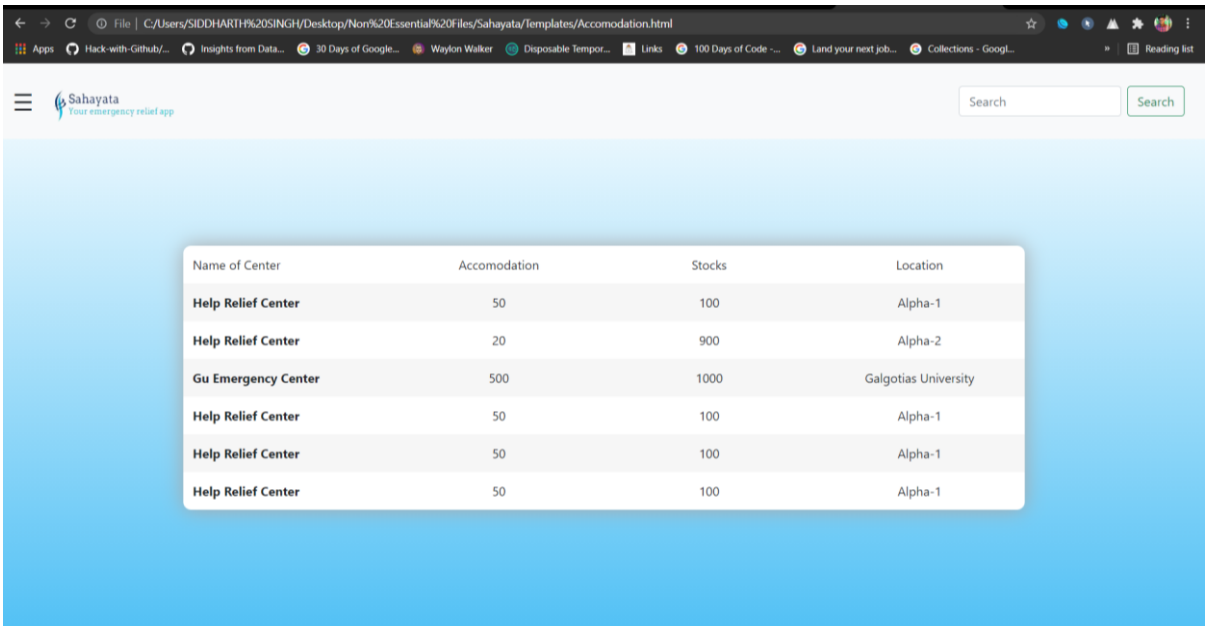
Technologies	**Tools Used**
Database	SQL
Cloud Server	Nginx Apache Based
Network Sensor Simulator	Python

CHAPTER-2
Literature Survey

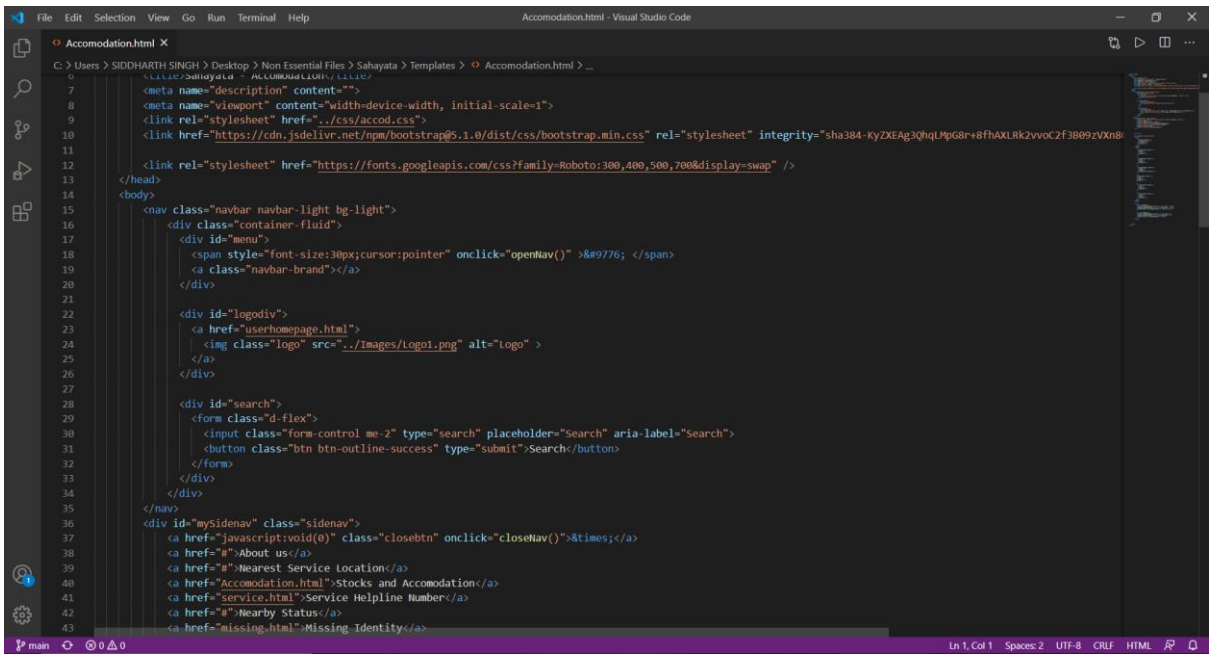
SENDROM was mainly proposed to be used in the case of earthquakes in Turkey as it is one of the most subject countries to earthquakes. The architecture of SENDROM consists of sensor nodes deployed prior to a disaster and central nodes stored nearby strategic centers and linked to the SENDROM database. The nodes are divided into several types; Cnodes are data Collector Nodes such as mobile computers. Snodes, deployed prior to a disaster, sense and report any living human in the vicinity. They are divided into Standalone nodes which are located, for instance, inside drawers and cabinets and Embedded nodes located, for example, in washing machines. This kind of nodes is capable of detecting vibration during an earthquake. Inodes are used for individuals and human beings. They are also divided into Standalone nodes which can be placed, for example, in pockets or in individual bags and Embedded ones in wristwatches, for instance. Cnodes invoke the Snodes and Inodes and then send the received data to the Central SENDROM Database. This latter is continuously updated by the EOCs and Cnodes. Figure 1 shows the SENDROM architecture after a disaster. Figure 1: SENDROM after a disaster. SENDROM Database Server has the role of getting information about buildings and individuals. This server can be queried form Internet allowing rescue teams to get prior information while on the way to the site. Rescue teams and EOCs query the SDS via Cnodes. Snodes and Inodes send data to the SDS via mobile access points (UAVs, cars, etc.). Note that Inodes always generate reports while Snodes generate them only when they detect a living human being in their vicinity. Sensor nodes include in the report the task id. of the query and Cnodes use the directional antennae to broadcast the task depending on their regions.

CHAPTER-3
Project Design

Code And Screenshot Of User Module



Name of Center	Accomodation	Stocks	Location
Help Relief Center	50	100	Alpha-1
Help Relief Center	20	900	Alpha-2
Gu Emergency Center	500	1000	Galgotias University
Help Relief Center	50	100	Alpha-1
Help Relief Center	50	100	Alpha-1
Help Relief Center	50	100	Alpha-1

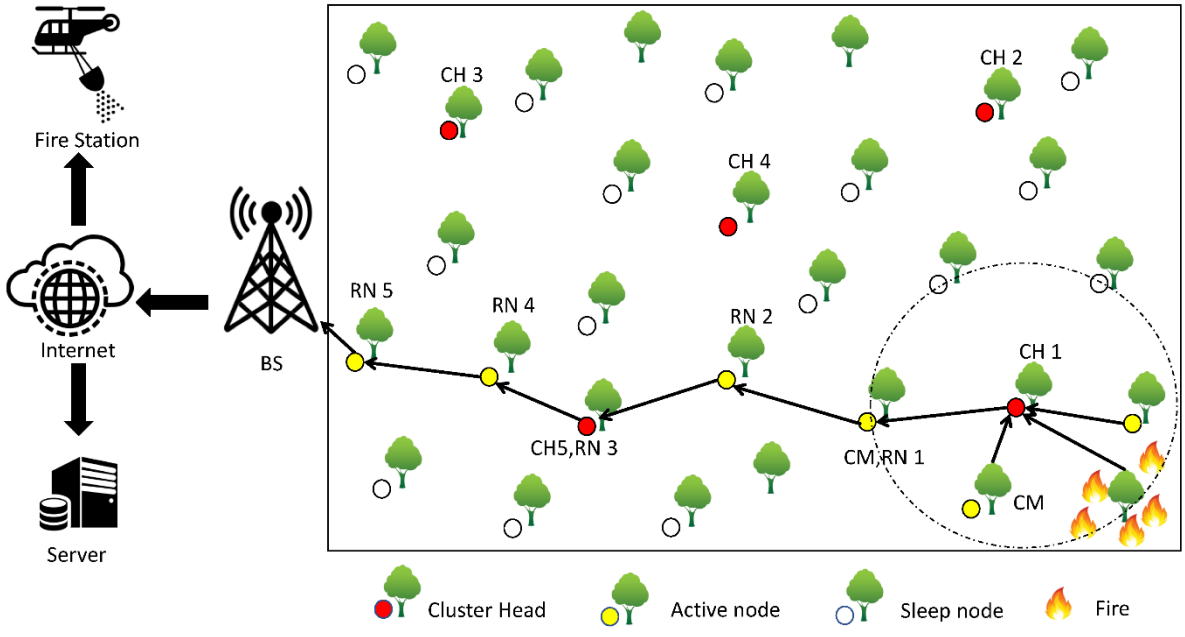


Code Of Admin Module

```
const express = require("express");
const mongoose = require("mongoose");
const router = express.Router();
const User = mongoose.model("User");
const bcrypt = require("bcrypt");
const jwt = require('jsonwebtoken')
const { JWT_SECRET } = require('../keys')


router.post("/signup", (req, res) => {
    const { name, email, password } = req.body;
    if (!email || !password || !name) {
        return res.status(422).json({ error: "Please add all the field" });
    }
    User.findOne({ email: email })
        .then((saveduser) => {
            if (saveduser) {
                return res.status(422)
                    .json({ error: "user alredy exists with same email" });
            }
            bcrypt.hash(password, 12).then((hashedpassword) => {
                const user = new User({
                    email,
                    password: hashedpassword,
                    name
                });
                user.save()
            });
        })
        .catch((err) => {
            console.log(err);
        });
});
```

Architecture Diagram



DIFFERENT WSN ARCHITECTURES

Each year floods result in the loss of thousands of lives and billions of lives value of goods in India. Last year, a major human loss lives, cattle and the number of billions of institutions was floods were reported in Bihar and West Bengal. Each year both Ganga and Yamuna broke their boundaries and cause much loss. Although all these losses are impossible completely eliminated but loss of life and property could be reduced to a minimum level of barest, if protective measures can be taken before disaster strikes in the form of light floods. This can also be done with the help of wireless communication technology sensory networks. System upgrades are included different categories and of course, all categories are equally important.

Starting with the first phase of data collection, the first level is to deal with the physical distribution of sensory equipment in on the banks of rivers and effective local implementation system depending on the situation and location. Flow river path, past records of water flow and future river route forecasts, influencing placement for wireless nerves. These senses form groups in order communication with local channels. Local domain channels are powerful enough to communicate with one person the other uses direct wireless communication.

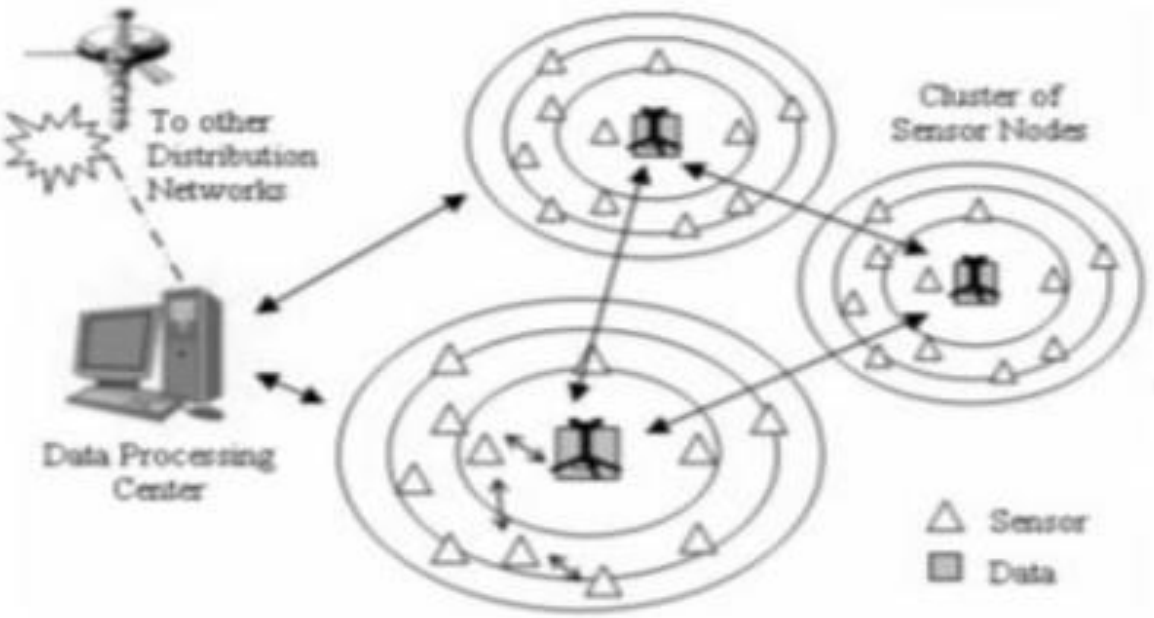


Figure 1. Features of image

Data sent from sensors is compiled locally basic delivery channels as input into data processing institutions. Fig.2 shows an image view of the distribution of sensors node and data integration [5].

The second level is concerned with setting up local channels such as data communication at the regional level. The third level can engage in a central monitoring program headquarters to process data obtained. Data analysis then occurs at headquarters or in foreign research institutes especially analyzing flood risk. Fig.3 shows the various categories used by the monitoring system.

B. Wireless Sensor Network for Forest Fire Detection

Forest house millions of rare species of animals, birds and insects. Forest fires not only cause loss of shelter but also and causes severe loss of plants and animals. Forest fires are there common in the central Indian subcontinent Himalayas due to Lighting, overheating or neglect of the area natives. There have been many times in the jungle fires erupted due to indigenous negligence in Uttarakhand, Chhattisgarh, and the northeastern regions. Last year, in southern Australia suffered heavy casualties in forest fires, however losses in human lives were reduced as a result adequate exit steps taken well in time. However it is almost impossible to put out a blazing fire, but disaster can be avoided when information about the location of the fire is provided it can be sent immediately to the nearest control center as well adequate measures are taken to control it, before it enters everything. Large number of dense sensor nodes planted in the forest. These sensory nodes are organized into collections so that each node has a corresponding group title.

Nerve nodes can measure local temperature, relative moisture and smoke. It is also assumed that they know their own location details with machines such as Global GPS positioning system. Every sensor node sends measurement data, as well as location information, in the head of the corresponding collection. The header of the group lists i the weather indicator uses the neural network method and sends I weather indicator on the manager node by sink. The sink is like that connected to the administrator node via a wired network. A little wind the sensor nodes are operated manually over the forest as well connected to the sink by wired networks to determine air speed [6].

Manager code provides two types of information to users:

(1) An emergency report of an unusual event (e.g. smoke or obtained very high temperatures);

(2) real-time forest fire risk level for each group based on weather indicators from the head of the collection and other aspects of forest fire.

C. EARTHQUAKE SENSOR NETWORK

The destruction of human lives and property occurs when earthquakes. That's the worst earthquake what happened in India was on the 26th of January, 2001 that did not stop not only India, but other neighboring countries such as Pakistan, Afghanistan and Iran also could not escape their wrath. Lakhs are missing lives, limbs and cattle and the loss of property was no obligation. Although property losses are uncontrollable outside, but many precious human lives can be saved in due time action. Our system system structure is displayed in Fig.5 each sensor detects an earthquake event with samples time based on seismic frequency spectrum. Managing I the force of an earthquake is the same as the most variable magnitude as well the location of the variable source, each sensor keeps separate mathematical models of frequency spectrum in different scales of Seismic signal strength is detected by a sensor [7].

Fig.5 System Architecture White blocks are parts of the sensor; shaded blocks are elements in the base channel; a solid line represents

data flow; the dotted line represents the flow of control Various studies have shown that the detector based on frequencies better detection performance when sensor receives high signal strength [8]. Therefore, it is suggested that, the foundation the channel first selects a small set of educational senses based on signal strength received by the senses over time to meet the hearing quality requirements of the system. Selected the sensors then connect the seismic frequency spectrum using Fast Fourier Transform (FFT) and make land acquisition decisions and then transferred to it basic fusion channel. In addition to the acquisition of Earthquake, the time to start an earthquake important for finding the source of the earthquake. In this way, the base station first indicates individual earthquakes as well estimates the first rough time [9].

D. Wireless Tsunami Discovery Network

Wounds are still burning in the hearts of all of them survivors who lost loved ones in the 2004 tsunami which destroyed the east coast of India. It is limited that tens of thousands of people died in that incident alone India and lakhs in other Asian countries.

Even later, about 32 countries around the world they were placed in caution, when an earthquake measuring 8.9 The Richter Scale has struck the Indian Ocean. Thanks for the success monitoring system, sound alert and offshore places were removed. Although the tsunami is not uncommon in India compared to Japan, Indonesia, Vietnam and In Thailand, however, it is wiser to wake up than to turn around grief. Tsunami detection and recovery plan using the ad hoc wireless network network defines three types of nodes: sensor, commander, and obstacle. A comparatively a number of sensor nodes collect underwater pressure readings across the coast. This data was reported to the administrator nodes analyze compression data and predict what, if anywhere, obstacles require fire. Although

impossible to completely stop the tsunami, we suggest using a number obstacles that may be involved in minimizing the impact of wave. Fig.6 shows the structure of the prototype system which can be used as a live model to reach a level perfection and satisfaction. Fig.6 shows the sensor network which includes 80 underwater sensors (Sensor1-Sensor80) that connected to two commander nodes respectively connected in four terms (Barrier1-Barrier4). The algorithm as suggested by K. Casey, A. Lim, and G.Dozier et.al. has been made [10] using a generator neural regression network (GRNN) [11] as determined by D.Specht, to predict the direction of the wave. GRNN is updating pressure data from the sensor nodes and predicts which one Barriers must be heated to prevent tsunamis successfully. It and uses a real-time distribution response method. This the procedure is recommended by RAP [12] predicted by C. Lu, B. Blum, T. Abdelzaher, J. Stankovic, and T. He but he does not need location information.

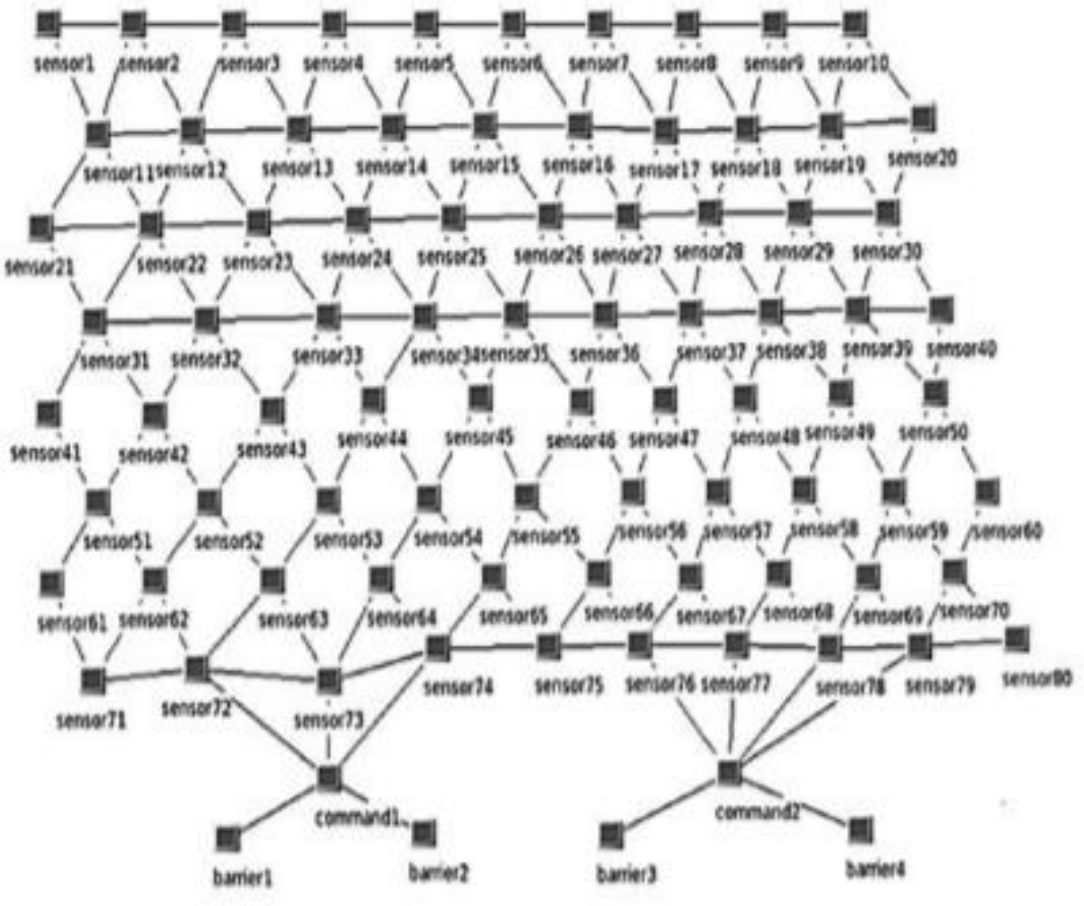


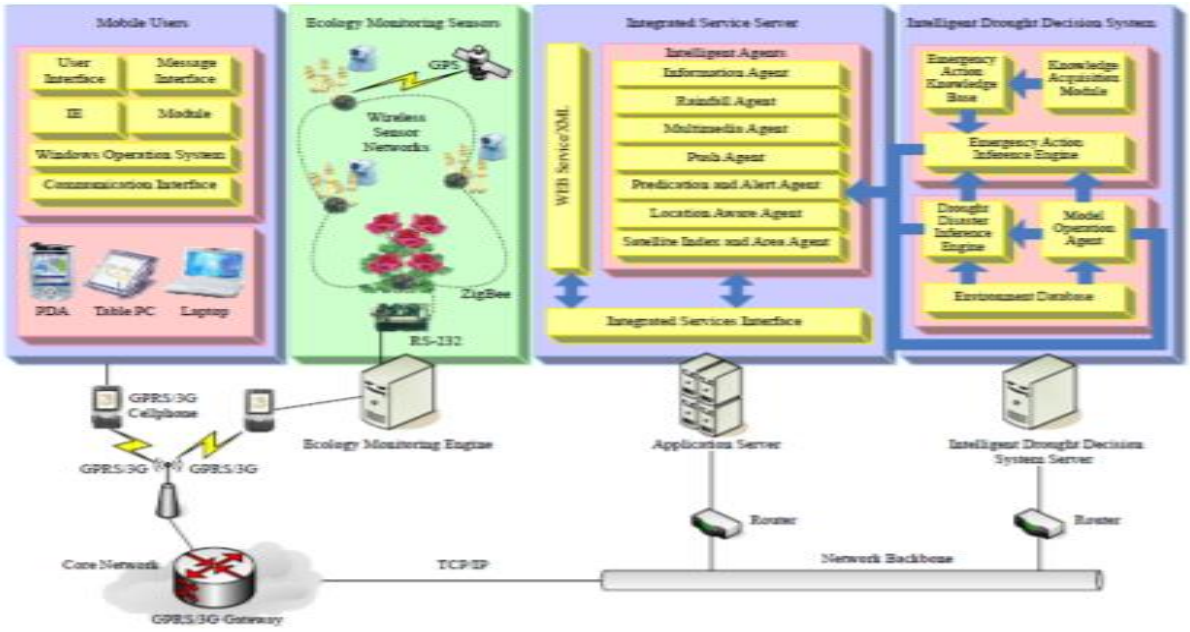
Fig.6 Tsunami detection and response system architecture

E. Wireless Sensor Network model for Drought Forecast

Many irrigation methods have almost eliminated this problem
of drought, but like many other developing and impoverished countries, India also depends on the rain gods annual rains to meet their water needs irrigation purposes. Performance suggested by Hsyang kung, jing-shiuan hua and chaur-tzuhn chen to predict drought through wireless nerve networks. I the proposed model is based on a clever system called Drought Forecast and Alert System (DFAS), 4-tier Mobile user interface (MUs) [13], Ecology Monitoring Sensors (EMSs), Integrated Service Server (ISS), and Intelligent Drought Resolution (ID2S) system.

DFAS integrates wireless, embedded sensor networks multimedia communication and neural network resolution technology to effectively achieve the prediction and alertness of the drought. DFAS analyzes the next 7 drought levels per day with the model of the proposed drought forecast taken from
Back-Propagation Network algorithm.

Drought-related conditions are taken for 30 days rainfall, daily temperature means, and soil moisture improve the accuracy of drought forecast [14]. These Thoughtful items are acquired, collected and transferred real-time with Mote sensors and mobile networks. Kanye a region with a potential drought risk has been identified, DFAS submits to change messages on users' electronic items. System use results reveal that DFAS provides drought professionals and users with complete local sensor data and photographs. DFAS makes it possible employees taking preventive measures, e.g., remediation of agricultural water, reduced losses.



CONCLUSION AND FUTURE WORK

Wireless sensor networks (WSNs) are very attractive attention over the past few years. As technology emerges from above for decades, WSN has come to light because of its unavailability probability and significance. We see that these are wireless sensor network architectures help us a lot in predicting causes of natural and man-made disasters as well to provide for remedial and preventive measures if they are somehow available the area has been hit by these disasters. So these structures are helpful to protect many precious human and animal lives that you are destined to perish from the effects created by these disasters.

WSNs not only contribute to saving lives but also plays an important role in preserving our unique plants as well multicellular animals and biological microorganisms, essential for human survival, which warns us of the dangers of forest fires. Finally we conclude by emphasizing the need to assess the status of research and classify different schemes. We made progress taxonomy of relevant qualifications and divided into different categories programs according to purpose, desired collection structures and the process of integration. We highlighted the effect of network model in the routes as well they summarize a number of programs, stating their potential limitations. This technology has produced very successfully results, if used in the installation of these wireless sensors networks for important purpose applications. In this paper, we developed countries like USA, Germany, France and England but in India there is still much to be done in this field like all of them these security networks require significant investment as well workers to make these dreams a reality in India.

SAHANA: OVERVIEW OF A DISASTER MANAGEMENT SYSTEM

Sahayata is a Free and Open Source Software (FOSS) application that aims to be a comprehensive solution for information management in relief operations, recovery and rehabilitation. The Sahana project has proved without a doubt the viability of FOSS solutions for humanitarian applications. More significantly, a disaster typically requires the coordination of multiple clients; hence Sahana has also provided a platform for inter-organizational data sharing during a disaster. There is much left to be for the technical development of FOSS as much sought disaster management software as the primary functional requirement is the need to deal with heterogeneity of data types (text, semi structured, Web HTML and XML, GIS, tabular and DBMS), and secondary functional requirement is to develop standards and protocols for data sharing. Policies for data security and privacy during the different phases of a disaster have to be developed to provide robust performance and finally be able to provide additional capabilities as the communications infrastructure is restored. Real time response may be needed for some modules such as mobile messaging and situation control.