

Smart Forest Security and Monitoring System

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ABSTRACT

Trees are the most important of our planet, not only in forest but also in countless another ecosystem. trees play an important role in maintaining biodiversity & providing food & Habitat for countless microorganism, The objective of this project is recognizing the enemy of the most important robbery in the forest regions. The theft & illegal development of commercial trees such as Sandalwood, Teak, Sagwan etc. these trees are the most valuable in the world. This is used in medical science & in addition beauty care products because of the large amount of money Involve in such sales of tree trunks & many indicates occurs by cutting a type & their smuggling.

Keywords : Forest Security, Smuggling, GPS, GSM

I. INTRODUCTION

In the recent day's we read in the newspaper or social media about trafficking. These trees are very expensive these are very useful in the medical science and cosmetics. Because of the large amount of money.

The problem we saw is there no medium or system to detect illegal smuggling of trees the explanation there is in our work. We can know what happens to the trees in the forest should be monitored, such a plan will help you to find and detect the illegal logging and cutting of trees and also it will alert us to take action by

considering this we design a system to help & to achieve our goal of a protecting trees by smugglers.

For years we have been plagued by illegal activity such as smuggling precious and commercial trees such as Teakwood, Sandalwood, Sagwan etc., from protected forest areas These trees are very expensive and commercial demands in the global market. Trees are there it is generally considered to be protected by marking others tags by hand. this will not be helpful and reliable from then on anyone can interrupt it. And in times of natural trees, it may somehow be damaged. The default SMART unit has it thus it was designed to

address these issues. A combination of latest wireless and communication system solutions provide us with such modules. Module is intended to work somewhere and this module will have units:

1.The Tree Unit

2.The Main Server Unit (base motion).

3.Each tree must have one Embedded System-Unit with: Arduino UNO Microcontroller, Sensors, WIFL Being close of the mentioned lists the sections will send the current state of the tree to Base station, using the internet module. Details sent via WIFI are like are like a bulletin/ information unit via the Internet, from now on IOT editing is built here. Details and the framework are defined by the Server in the Basic Channel. The basic channel has a server that stores all your data of each tree. Construction channel connection is available in light of the latest in novation's using Amazon Web resources. Blynk is a product used in Server to translate the outline of the information of the trees in the forest. On the law server only allowed per person close to database. The database is being investigated whether the tree is protected or removed. Still the database keeps updating about the current tree condition and critical conditions should about go to Forestry experts. For example, if a tree has fallen the "vibration Sensor information" will be a rare incentive than standard set limit rate.

II. METHODOLOGY

This forest conservation project is a project that we have made to avoid the smuggling of saplings and valuable big trees that are dying in the forest and to control the valuable trees of the forest such as sandalwood and Tega, bete. Surviving the human race. This research was done under following four steps

1. Study about the forests we know and the terrible and destructive poaching and other incidents that have happened in them

2. Explain the use of various techniques for our project and the sensors used

3. Brief information about the Arduino controller and GPS module GSM module

4. Testing the complete software and fixing them

1)Karnataka Forest canopy density classes, the State has 4,501.15 sq km under Very Dense Forest (VDF), 21,048.09 sq km under Moderately Dense Forest (MDF) and 13,026.24 sq km under Open Forest (OF). Uttara Kannada has the largest number of forest areas and there are several forest sanctuaries like Brahmagiri, Adichunchanagiri, Dandeli etc. In all these forests some of these forests have been planned to avoid poaching and carding and to conserve animals.

2)As we know, controlling at one place by using Arduino and other micro controller, also several sensors are developed in this, three important sensors are developed in our project 1. Flame sensor to detect forest fire and 2. vibration sensor to detect cutting of trees, 3. Ultrasonic sensor is developed to identify animal movement.

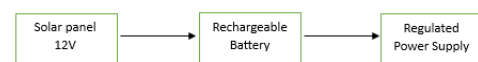
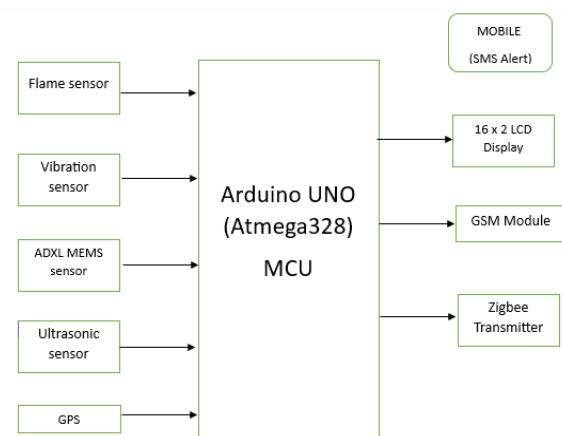


Fig1.Transmitter Block Diagram



Fig2.Receiver Block Diagram

3) The system consists of two units:

A. Tree Unit and B. Control Room Unit

A. TREE UNIT:

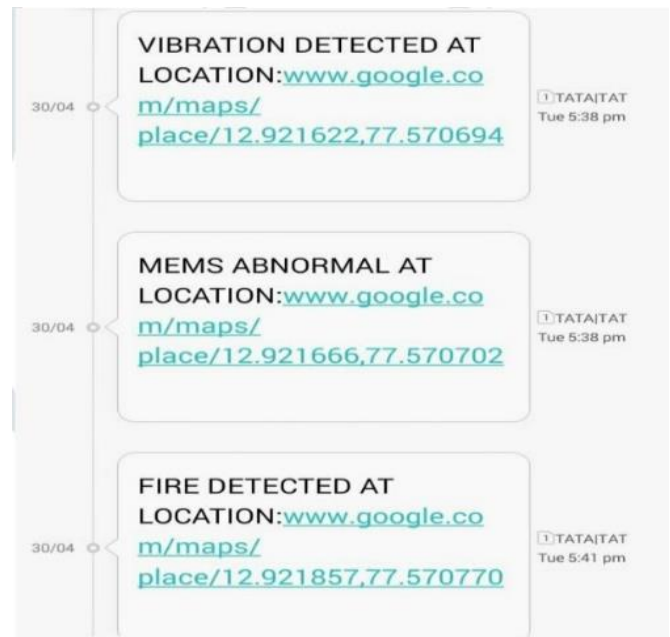
Tree unit has necessary sensors to know its condition status. This unit consists of three sensors to give the information of activities such as Cut Down of trees, fire detection etc. This unit is powered with solar energy and rechargeable batteries.

Tree unit basically consists of three sensors which are Vibration Sensor, MEMS Accelerometer Sensor and Fire Sensor. The controller is also equipped with GSM, GPS and ZigBee Transmitter. When the smuggler starts to cut the tree, the vibration created by it is sensed by the vibration sensor and the tilted position of the tree is sensed by MEMS Accelerometer. GPS is used to get the location details such as Latitude, Longitude which are sent to an authorized mobile number with Google Map Link using GSM when the sensors threshold values are crossed. ZigBee Transmitter notifies the base station about the illegal activity.

B. CONTROL UNIT:

The control room unit basically consists of ZigBee receiver and TTL to USB converter which displays data 4) Check the connection of this project that we have made, put it in the microcontroller, then test the sensors, if there is anything wrong, identify it, correct it, check it again, and finally, the result can be viewed on the mobile.

Result: in this paper a total set up of programming using GPS & GSM with specific sensors & microcontrollers the tracking system is based on cloud computing infrastructure. The administrator after receiving alert message with location will analyze shortest path using maps or other resources. and information send to the forest department The alert message notification shows in belfigure



The output of fire monitor when an abnormal situation
Latitude : 12.921279

Longitude: 77.570747

[www.google.com |maps|place|12.921279, 77.570747](https://www.google.com/maps/place/12.921279,77.570747)
fire detected the output when vibration is sensed by vibration sensor is as shows vibration detected message sent to authorized phone number when an abnormal condition at the connection 15 noticed forest picture.



Conclusion

The forest is essential for surviving of wildlife they are the source of many direct and indirect benefits the main purpose of the project is to protect the valuable trees such as sandalwood, teakwood, rosewood etc. Using this system we can easily track the smuggling activities which reduces deforestation and helps in monitoring the ecological balance and it also helps to protect wildlife We use the flame sensor to detect the fire in the forest region and it helps to avoid the destroy the tress and animals Here we set the ultrasonic sensors in the boundaries of forest regions to detect the our targets (animals) it helps to protect the wild animals surrounding peoples by the wild animals and easily caught the animals.

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