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SYSTEM TO DETECT ILLEGAL LOGGING OF FOREST TREES

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CONTENT

- Abstract
- Introduction
- Problem Statement
- Objective
- Literature Survey
- Limitations of Existing Systems
- Research Gap and Research Challenges(Gaps identified and Challenges being faced and ongoing work, if available)
- Proposed Methodology
- Expected outcomes
- References

ABSTRACT

- Illegal logging has been identified as a major problem in the world, which may be minimized through effective monitoring of forest covered areas.
- The manual monitoring of the forest to prevent unauthorized activities is practically difficult job.
- The Main objective is to build/develop a System to detect illegal logging of trees in forests and also forest fire using IoT (by making use of sensors) .

INTRODUCTION

- Illegal logging of trees has a devastating impact on the environment like deforestation and loss in biodiversity.
- Studies indicate that more than 100 million cubic metres of timber are still being cut illegally each year.
- We can prevent / reduce illegal logging by effective monitoring of forest covered areas with the help of IoT based smart and intelligent Systems.
- The aim is to create a system that is capable of recognizing illegal logging using sound and vibration sensors, and detect fire using flame and smoke sensors and provide warning that illegal logging and/or fire may be occurring.

OBJECTIVE

The main objective is to develop a System to Detect Illegal Logging of Forest trees and early fire detection that has the following functionalities:

- The system can monitor, analyse in real time and detect Illegal logging of trees and forest fire.
- Sends alert message to responsible personal/department and also triggers an alarm when illegal logging or fire is detected.
- Analyse the data collected by Smart System using Think-Speak
- Think-Speak is a cloud based IoT analytics platform that allows user to aggregate, visualize and analyse the data collected via sensors.

LITERATURE SURVEY

- The environmental effects of illegal logging include deforestation, the loss of biodiversity and the emission of greenhouse gases.
- "The World Bank estimates that governments worldwide lose between US$ 10 billion and 15 billion each year as a result of illegal logging“
- While other people and countries may think that it only affects the producing countries, long-term climatic, economic, and environmental problems will affect most of the countries in the world.
- In India According to data accessed from the Ministry of Environment, Forests and Climate Change (MoEF), a total of 10.8 lakh trees from 15 states and two UTs have been reported through 1.76 lakh cases, at an average of six trees felled under each case

Cases Detected and Trees Lost in 3 Years:

Year	Cases Detected	No. of Trees Lost
2016-17	68823	411094
2017-18	66932	356419
2018-19	40348	312588
Total	176103	1080101

Source: MoEF | States/UTs included: Andhra Pradesh, Bihar, Haryana, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Punjab, Telangana, UP, West Bengal, Arunachal Pradesh, Manipur, Mizoram, Sikkim, Chandigarh.

- Hence, it can be concluded that Illegal Logging and Forest Fires is driving the loss of forests the poses the biggest threat to our natural eco-system and biodiversity. It is our responsibility to reduce deforestation as much as possible to maintain balance and for a sustainable future.

LIMITATIONS OF EXISTING SYSTEMS

In India Forest survey is done manually by designated officers, the Forest Survey of India (FSI) is an organization under the Ministry of Environment and Forests(MoEF) which maintains records in form of forest Inventory that has information about No. of trees and there types etc.

Disadvantages of the System:

- Requires more man Power as everything is done manually.
- Time Consuming
- No mechanism to detect Illegal logging and Forest fire in Real-Time.

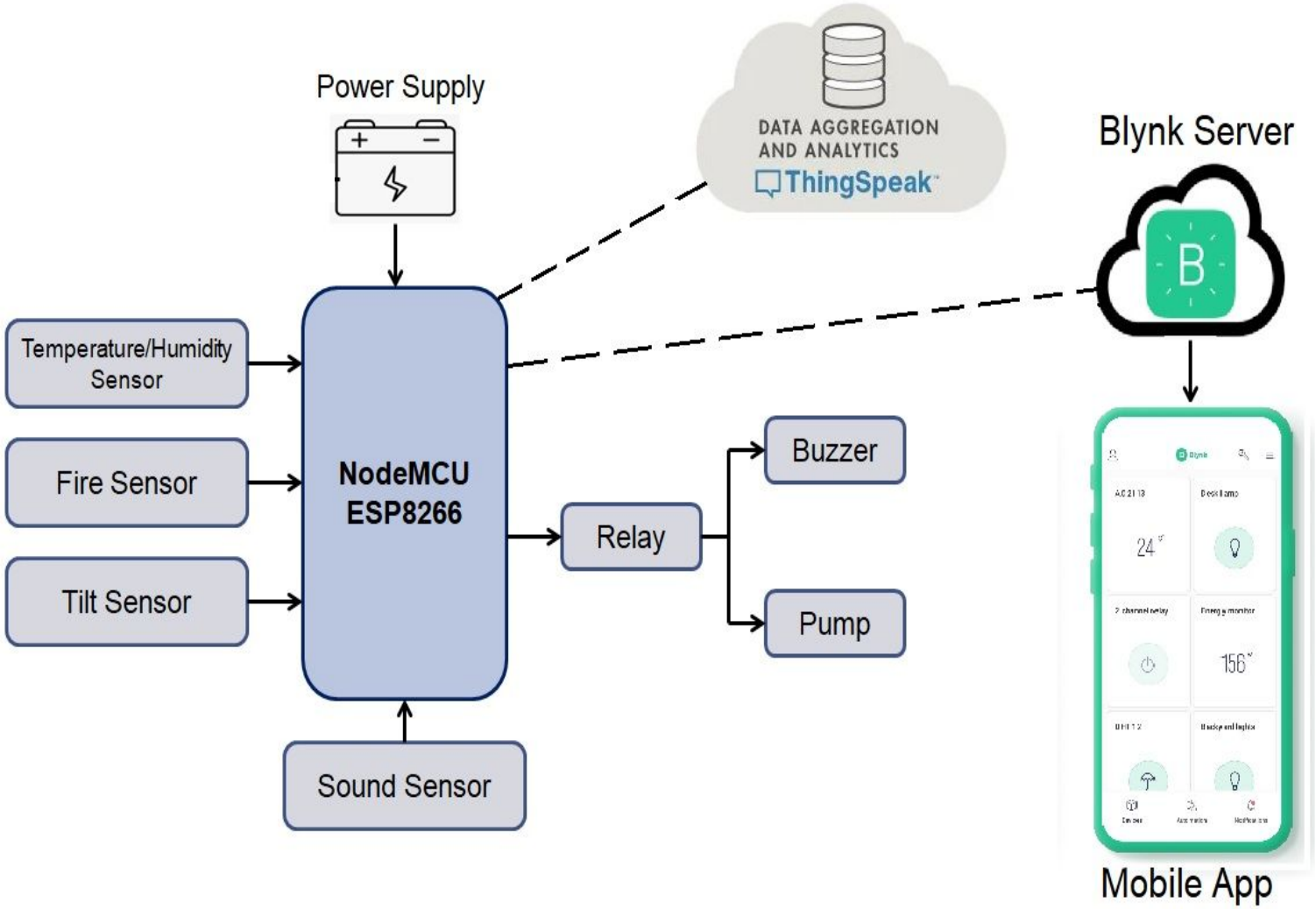
System to detect Illegal Logging through ZigBee wireless module.

The system is implemented using Arduino Micro controller along with ZigBee Wireless module.

Disadvantages of the System:

- Its range is limited to a single tree.
- It connects only to a dedicated LAN/ PAN
- Does not send alert message to responsible personal but sends notification to the host website, user is required to keep tabs of notifications.

PROPOSED METHODOLOGY



EXPECTED OUTCOME

This Systems Functionality:

- Monitoring devices installed in the Forest environment that collect and transmit data to cloud server.
- Whenever the system detects logging of trees or detects forest fire it sends an alert and triggers the alarm.
- Cloud-based server helps analyse the collected data and sends alerts to responsible people/department.

Advantages of Proposed System:

- It covers a range of 4-5 meters
- Reduces man power and provides 24/7 Surveillance.
- Enables instant response and action
- It supports both GSM(Mobile Network) and dedicated LAN/ PAN
- The System is able to notify and send alerts via SMS in Real-Time

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