F L O O D M O N I T O R I N G S Y S T E M

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phase 1 document submission

project- flood monitoring system

PRESENTED BY

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Advancing Flood Monitoring: Enhancing Resilience through a Smart System

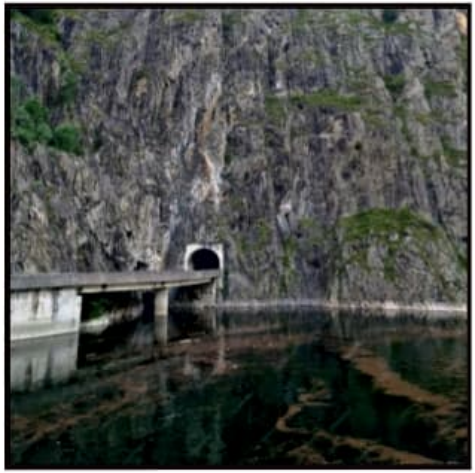
Understanding Floods

Floods are natural disasters caused by an overflow of *water* onto normally dry land. They can result from heavy rainfall, rapid snowmelt, or dam failure. Floods can cause significant damage to infrastructure, property, and human lives. Understanding the causes and behavior of floods is crucial to developing effective flood monitoring systems.

Introduction

Welcome to the presentation on *Enhancing Disaster Resilience: A Comprehensive Flood Monitoring System*. In this presentation, we will discuss the importance of effective flood monitoring and how it can help in disaster management. We will also explore the key components of a comprehensive flood monitoring system.

Importance of Flood Monitoring



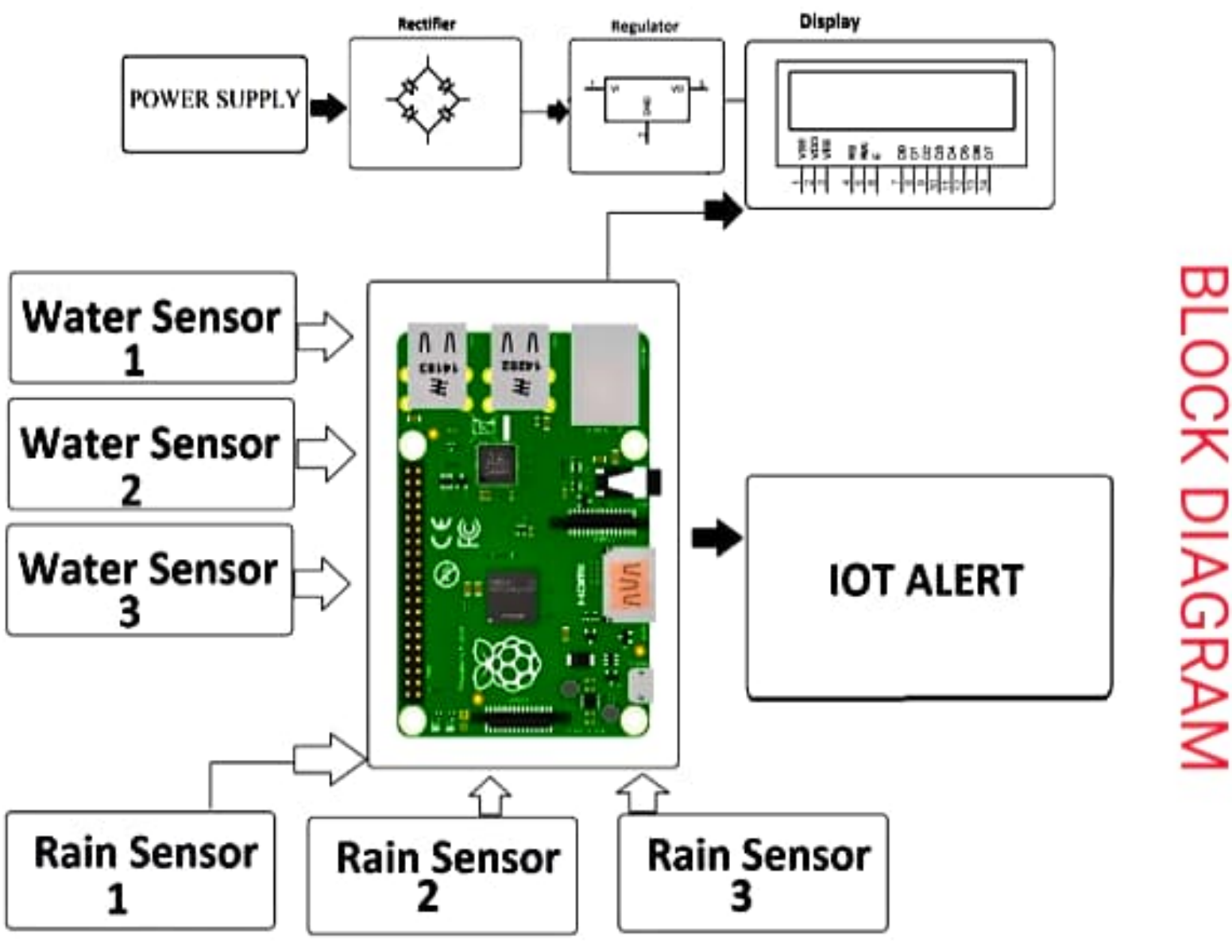
Effective flood monitoring plays a vital role in disaster resilience. It helps in early detection of *flood events*, allowing authorities to issue timely warnings and evacuate vulnerable areas. Flood monitoring systems also provide real-time data on water levels, rainfall, and river flow, enabling better decision-making for disaster response and recovery efforts.

NEED OF FLOOD MONITORING

A flood monitoring system is used t o monitor a rise in water levels. The system comprises sensors that are deployed in cities or any area of int erest. The sensors can be connecte d to either the main electricity or can be solar-powered.

Solution For Flood monitoring system

In this system we make use of a ras pberry pi with water sensors, rain se nsors to predict flood and alert resp ective authorities and sound instant alarm in nearby villages to instantly transmit information about possible floods using IOT. The water sensors are used to measure water level of 3 different locations.


Rectifier
Regulator
Display
POWER SUPPLY
Water Sensor 1
Water Sensor 2
Water Sensor 3
IOT ALERT
Rain Sensor 1
Rain Sensor 2
Rain Sensor 3
BLOCK DIAGRAM

Hardware and software requirement

Under the analyses made the hardware and the software requirements are Arduino uno, microcontroller, level sensors, temperature sensor, IR, IoT Esp8266, Language embedded c, Arduino IDE.

PROGRAM

```
#include <SPI.h>
#include <Ethernet.h> // For Etherne
t connectivity
#include <ThingSpeak.h> // For IoT
integration

byte mac[] = {0xDE, 0xAD, 0xBE, 0xE
F, 0xFE, 0xED};
EthernetClient client;

const int waterSensorPin = A0; // An
alog pin for water level sensor
const int ledPin = 13; // Pin for statu
s LED

const char *api_key = "YOUR_THING
SPEAK_API_KEY";
const char *channel = "YOUR_THING
SPEAK_CHANNEL";

void setup() {
  Serial.begin(9600);
  Ethernet.begin(mac);
}
```

```
void loop() {
  int waterLevel = analogRead(water
SensorPin);
  if (waterLevel > THRESHOLD) {
    // Water level is above the thresho
ld, indicating a flood.
    digitalWrite(ledPin, HIGH);
    sendToFloodChannel(waterLevel)
;
  } else {
    digitalWrite(ledPin, LOW);
  }
  delay(10000); // Check water level
every 10 seconds
}
void sendToFloodChannel(int water
Level) {
  ThingSpeak.begin(client);
  ThingSpeak.setField(1, waterLevel
);
  int status = ThingSpeak.writeFields
(channel, api_key);
  if (status == 200) {
    Serial.println("Data sent successf
ully");
  } else {
    Serial.println("Data send failed");
  }
```

Conclusion

In conclusion, a comprehensive flood monitoring system is essential for enhancing disaster resilience. It enables early warning, real-time data analysis, and informed decision-making during flood events. By investing in flood monitoring systems, we can mitigate the impact of floods, protect lives and property, and build more resilient communities. Together, let's work towards a safer and more disaster-resilient future.

Components of a Comprehensive Flood Monitoring System

A comprehensive flood monitoring system consists of several key components. These include *remote sensing* technologies, such as satellites and radar, for monitoring large-scale flood events. Ground-based sensors, such as river gauges and rain gauges, provide localized data. Data integration, analysis, and visualization platforms enable effective interpretation of flood data.