

COLLEGE NAME: Priyadarshini Engineering college

COLLEGE CODE :5119

COURSE NAME: Internet Of Things

GROUP NUMBER: Group 2

PROJECT TITLE:Flood Monitoring And Early Warning

PROJECT SUBMITTED TO: Skill Up online

YEAR: IIIrd Year

DEPARTMENT:Electronic And Communication Engineering

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Innovation:

Deploy loT sensors near water bodies and in flood-prone areas to monitor water levels. This data can be shared on a public platform to issue early flood warnings and assist emergency response teams.

Use IOT sensors such as ultrasonic sensor and other sensor that operates on RADAR technologies to monitor water levels. This data is then fed to any processor such as Arduino or raspberry pi with appropriate power connections. ESP8266 module is fitted to connect with internet. This data is then shared on a public platform

Block diagram

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Data Sources

Weather

River Gauges

Rainfall

Satellite

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v

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Data Acquisition

and Sensors

|

v

0

Data Processing

and Analysis

|

v

0

Decision Support

System

v

0

Early Warning

Alerts

|

v

0

Communication

Infrastructure

|

v

0

GIS (Geographic

Information

System)

|

v

0

Public Interface

|

v

0

Emergency

Response Teams

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v

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Monitoring and

Feedback

|

v

0

Historical Data

Storage

|

v

0

Power Supply and

Backup

Description

The working principle of a flood monitoring and early warning system involves a series of steps and processes aimed at detecting and responding to potential flood events. Here's a high-level overview of the working principles:

1. Data Collection: The system collects data from various sources, including weather stations, river gauges, rainfall gauges, and satellite imagery. These sources provide information about weather conditions, river water levels, rainfall amounts, and more.

2. Data Transmission: The collected data is transmitted to a central system or data processing center. This transmission can occur through wired or wireless networks, depending on the infrastructure in place.

3. Data Processing and Analysis: The central system processes and analyzes the incoming data in real-time. Algorithms and models are used to assess the data and identify patterns that could indicate potential flooding. This may include analyzing rainfall intensity, river water levels, and weather forecasts.

4. Risk Assessment: Based on the analyzed data, the system assesses the risk of flooding in specific areas. It considers factors such as the current conditions, historical data, and known vulnerabilities.

5. Decision Support: A decision support system interprets the risk assessment and determines whether there is a need for early warnings. It sets predefined thresholds and risk levels to trigger alerts.

6. Early Warning Alerts: When the system detects a significant flood risk, it generates early warning alerts. These alerts are sent to relevant stakeholders, including local authorities, emergency response teams, and the public. Common communication channels for alerts include SMS, email, sirens, mobile apps, and public broadcasts.

7. Emergency Response: Relevant authorities and emergency response teams receive the alerts and take appropriate actions. This may include initiating evacuation plans, activating emergency services, and coordinating relief efforts.

8. Public Information: The system provides information to the general public through various means, such as web portals, mobile apps, and public displays. Citizens can access flood forecasts, safety tips, and evacuation routes to make informed decisions.

9. Continuous Monitoring: The system continuously monitors flood conditions and the effectiveness of the warnings. It updates its assessments as new data becomes available.

10. Historical Data Storage: Long-term storage of historical data allows for analysis, research, and the improvement of flood prediction models. It also helps in evaluating the performance of the system over time.

11. Power Supply and Backup: Reliable power sources and backup systems are in place to ensure the continuous operation of the system, even during power outages or adverse conditions.

The working principle of a flood monitoring and early warning system relies on the integration of data from multiple sources, advanced data analysis, and timely communication of alerts to minimize the impact of floods and protect lives and property.