# FLOOD MONITORING AND EARLY WARNING

PHASE-2

INNOVATION

INTRODUCTION

Floods are among the most destructive and life-threatening natural disasters, causing widespread damage to communities and infrastructure. Timely and accurate flood monitoring and early warning systems are essential to mitigate these risks and save lives. In recent years, the integration of Internet of Things (IoT) technology has revolutionized the way we detect and respond to floods. IoT-based innovations have ushered in a new era of flood management, offering real-time data collection, advanced analytics, and rapid communication channels. This exploration will delve into the remarkable innovations in flood monitoring and early warning systems achieved through the deployment of IoT technology, highlighting their significance in enhancing resilience against this formidable natural threat.

IOT SENSORS

➢ Low-cost, low-power IoT sensors are deployed in flood-prone areas to monitor water levels, rainfall, and soil moisture in real-time.

➢ These sensors transmit data to central servers, providing up-to-the-minute information.
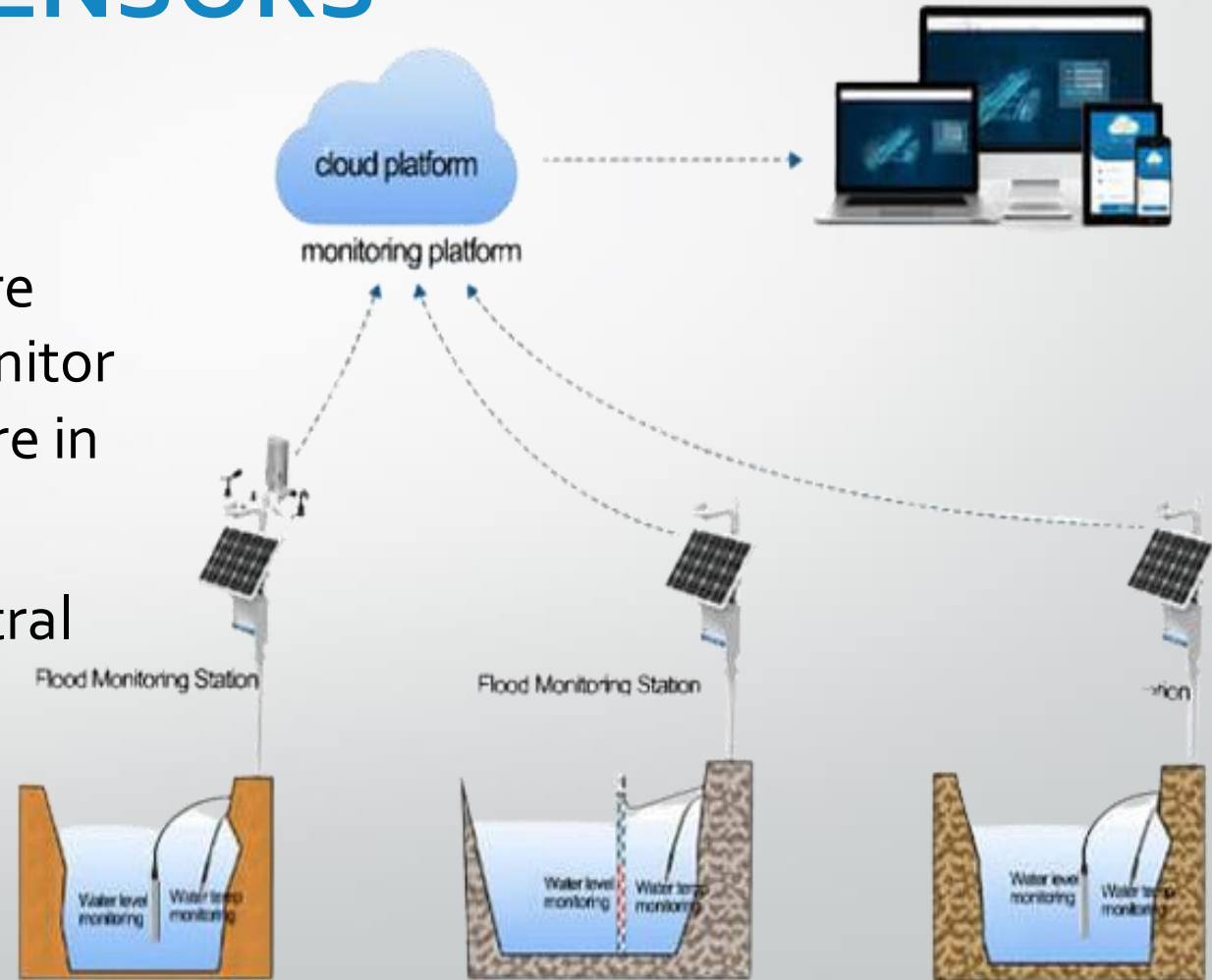
DATA FUSION

➢ IoT sensors collect data from various sources, including river gauges, weather stations, and satellite imagery.

➢ Advanced data fusion techniques combine this information for more accurate flood predictions.
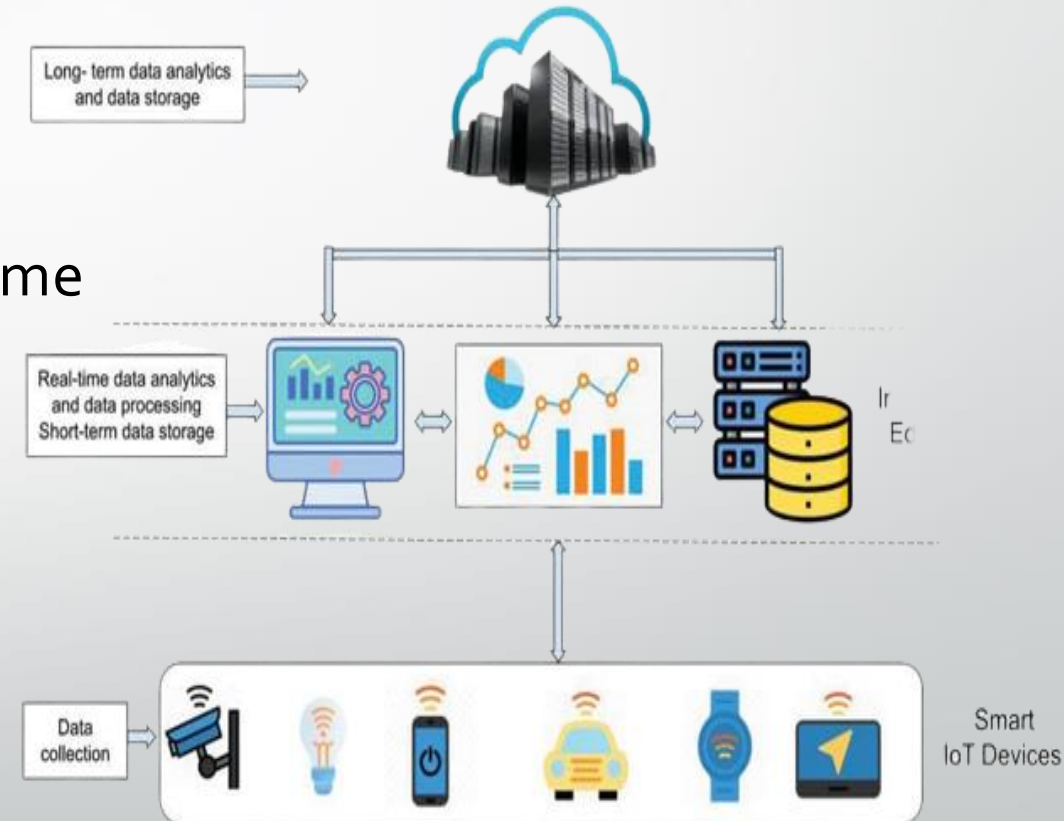
MACHINE LEARNING

➢ Machine learning algorithms analyse IoT data to detect patterns and trends, improving flood prediction accuracy.

➢ These models can adapt and learn from historical data to make better forecasts.
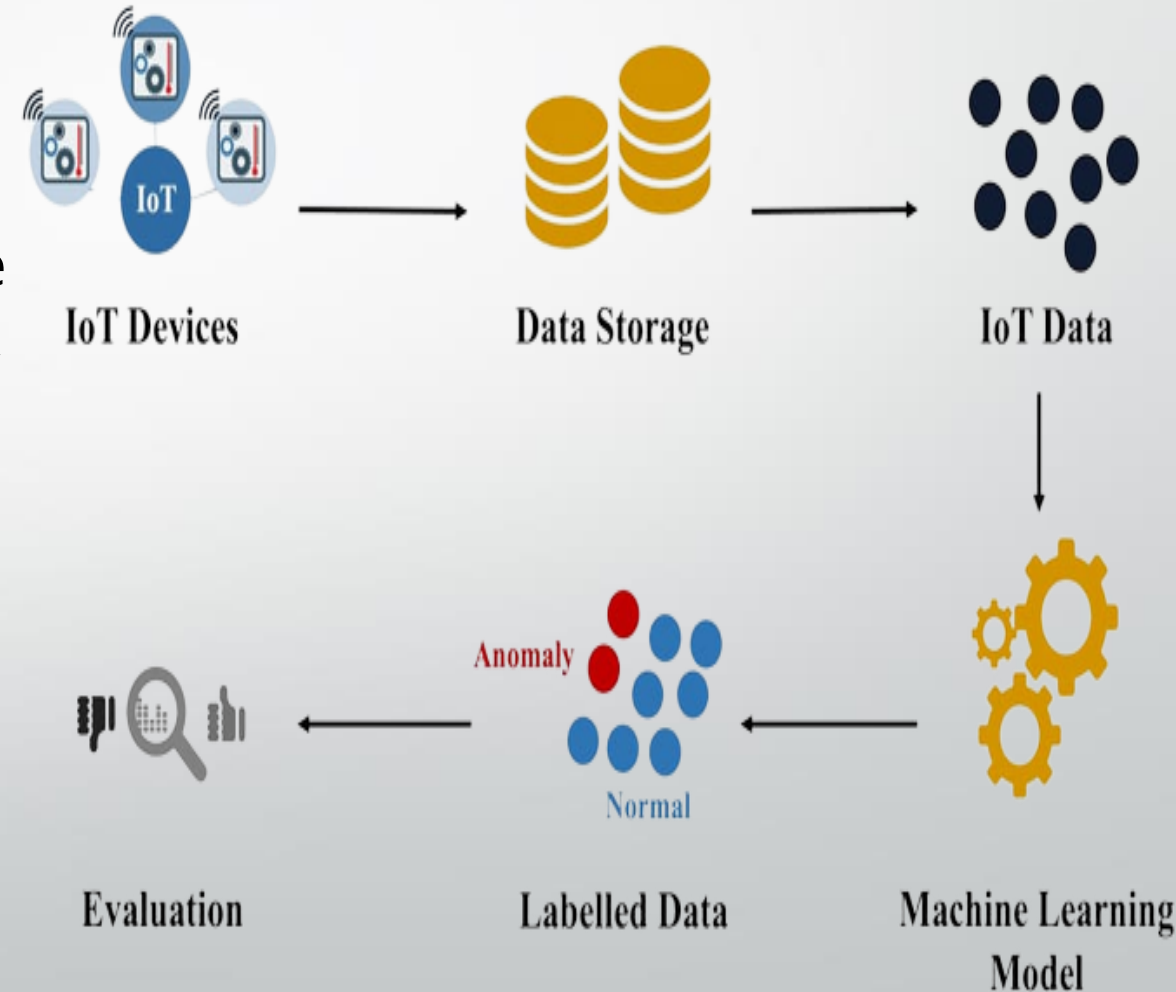
EDGE COMPUTING

➢ Edge devices, equipped with processing power and AI capabilities, are used for real-time data analysis.

➢ This reduces latency and allows for faster decision-making in emergency situations.

Long- term data analytics and data storage

Real-time data analytics and data processing Short-term data storage

Data collection

Smart IoT Devices

WIRELESS COMMUNICATION

➢ IoT devices use wireless communication technologies like LoRaWAN, NB-IoT, or cellular networks to transmit data.

➢ This ensures data is reliably transmitted even in remote areas.
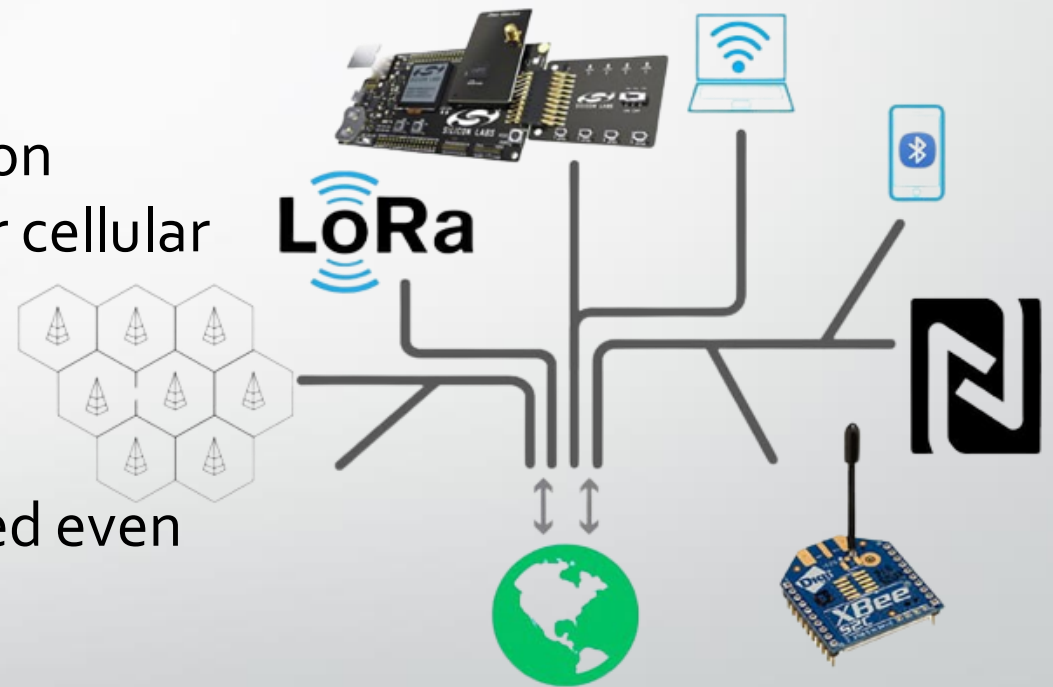
SMART FLOOD WARNING SYSTEMS

➢ IoT-based warning systems send alerts to residents' mobile phones, warning them of impending floods.

➢ These systems can also trigger sirens, activate road signs, or control flood barriers automatically.

NO SUBMERGED OBSTRUCTIONS

REMOTE MONITORING

➢ IoT enables remote monitoring of flood-prone areas, reducing the need for physical presence and allowing authorities to respond promptly.
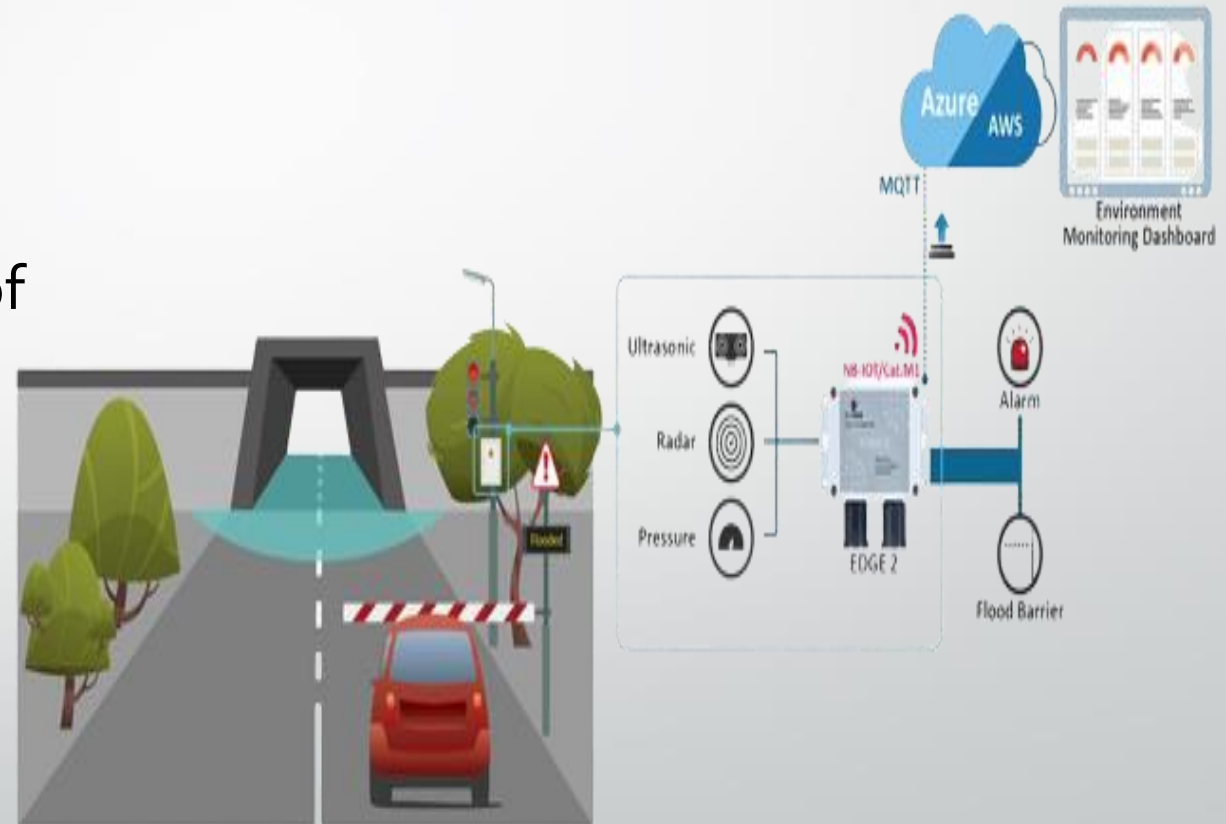
DATA VISUALIZATION

➢ IoT-generated data is often visualized on user-friendly platforms or mobile apps, making it easier for the public to access and understand.

PREDICTIVE ANALYTICS

➢ IoT data can be used for predictive analytics, allowing authorities to anticipate flood events days or even weeks in advance, giving communities more time to prepare.

RESILIENCE PLANNING

➢ Long-term data collected by IoT sensors helps communities plan for flood resilience by identifying high-risk areas and optimizing infrastructure.

CONCLUSION

These IoT innovations are transforming flood monitoring and early warning systems, enhancing our ability to protect lives and property from the devastating impact of floods.

THANK YOU