INTRODUCTION

In most countries of the world, the flood caused large damage and involved it in significant amounts of loss to individuals and its properties. Even so, we can forecast rain or to track the path of the storm exactly from satellite image, the need to have real-time monitored data is important to make a rational decision on the actions needed to be taken and have good flood response operating system to manage all the movement of the floods.

Every year, it causes lives and damage to infrastructure, agricultural production and serious damage to local economic development. In recent years, high rates of removal, extensive area clearing, and communal forest intrusion, in addition to ineffective protection of cut-over forests, have accelerated the increasing need to address flood risk in the urban and even the rural region. *Due to the significant reduction of forests, peak floods can travel faster to generate higher risk within a short period of lead in populated areas. Problems also include heavy local rainfall, storms may result to typhoon and inadequate drainage, which is causing floods.* Where in this research study is made to track the map of the affected areas, to inform the individual user and they can manage their plan far from possible flood risk. Using this system, the user can view flood movement and status using red color coding of the areas where high flood levels occur caused by heavy rainfall or result of natural disaster.

Many studies have been conducted on research and development of early mobile warning systems communication and information-based technologies. This is mobile communication technologies are well known devices and machines are growing rapidly in the

industry and the global world. Previous research was developed using mobile based technologies such as floods monitoring systems and early warning based on SMS

Where this research includes the use of Internet of Things technology, along with data analysis, can help monitor floods and provide information that can predict floods, in addition this technology requires significant sources of data processing due to the large amount of incoming data, which can result in delays when real-time situations are measured. To develop an effective flood monitoring system, Internet of Things technology can be used in conjunction with sensors and other technologies, such as machine learning and artificial intelligence techniques. Also, ultrasonic sensors and cellular transmission technologies can be positioned to ensure adequate transmission rates and to prevent data loss by implementing optimized telemetry and lightweight structure data methods to reduce the load of incoming data.

Methods

Message Queuing Telemetry Transport is an open machine-to-machine connection protection designed specifically to implement Internet of Things solutions, low data and bandwidth consumption. Message Queuing Telemetry Transport is ideal for devices that use low power technology and have low data transmission requirements. RiverCore is designed to use a Message Queuing Telemetry Transport Protocol to transmit data through a SIM communication module integrated into the main board. The device sends strings of data using AT-Command from the Microcontroller Unit (MCU) to the SIM module to communicate with an external Message Queuing Telemetry Transport broker.

Eclipse Mosquitto ™ is an open source messaging system that interacts with multiple devices using the MQTT protocol, containing a low line of code. It is installed in a server-side environment that manages all subscription and labor topics. The MQTT protocol implements a basic structure, called " topic ", in which messages are sent. The RiverCore server-side environment is implementing a data capture method that uses a Mosquitto broker to receive messages from the fixed RiverCore and mobile node. These messages are stored in a NoSQL MongoDB database environment. Due to the combined use of the MQTT protocol and a non-relational database architecture, the RiverCore environment can be implemented across a variety of different clients.

MongoDB is a database model and is based on JavaScript Object Notation formats of files stored in data collections. Because each document is made up of different structures, any

data log has the ability to have different properties. The RiverCore server implements MongoDB to save readings of a device because different sensors can be connected to the RiverCore datalogger by using different log structures in its databases.

Because RiverCore uses a wireless delivery environment, it can be vulnerable to sniffing technologies or external interference. Considering possible security threats, the system includes security techniques embedded in the delivery protocol, allowing the MQTT protocol to set encrypted server-side credentials for the server per device and user. Using this same method proposes a message-based security token contained in the message header to provide a unique message type contained in code '0000', creating a "spublish" method with encrypted payroll encrypted. This security measure for the MQTT protocol considers how to register different devices by assigning them a unique identity through a Universal Resource Identifier.