ADVANCED REAL-TIME FLOOD REGULATING DISCHARGE DRAIN

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Abstract:

Natural disaster is a phenomenon which was uncontrollable by humans to a larger extent. Out of several catastrophes, flood is a huge force which destroy the everything in its run and leads to lot of property damage and causalities but its highly impossible to avoid the generation of floods due to excessive rainfall but some minor floods which may occur due to light to moderate rainfall and observing following problems such as blockage of roads, destroying the pavement, huge traffic congestion due to submerged pavement, Hydroplaning and accidents, dampness and unhealthy environment etc., hence regulation of this minor flood is very much essential using advanced technology. Keeping above as problem statement in the present study an attempt has been made to regulate and store minor flood water in the drains without harming to any property using sensor modules. A sub terrestrial tanks were installed below the drains in series and drains are connected with flood gates. When water reaches to threshold level (85% of depth-before over flowing) flood gates opens automatically to allow water to enter sub terrestrial tanks and when water in the sub terrestrial tanks reaches to maximum depth, sensors activates and catches the information and switch to the pump so that water will be discharged to natural stream and the entire sequence of operation is automated and real-time analysis with alarming stages of depth of water.

Keywords: Flood, Rainfall, Drain, Sensor.

Introduction:

Floods are natural disasters that occur when an area of land becomes submerged in water. They can be caused by a variety of factors, including heavy rainfall, melting snow, dam failures, or tidal surges from the ocean. Floods can happen quickly or develop gradually over time, depending on the circumstances. But we know prevention of floods are highly impossible.

After a major flood, a country's society and economy suffer in a variety of ways due to the loss of people, vegetation, property, and infrastructure. As a result, there are fewer people in the labour force, less agriculture available for consumption locally and export, and fewer businesses to support the growth of the economy, many of them could end up homeless and jobless. In the other context minor floods also leads to lot of sufferings such as, flow of water on the road which may leads to Hydroplaning conditions, huge traffic jam, property damage, causalities, drowning

situations etc., hence there should be some technology and investigations are essential which may give effective solutions to regulate this minor flooding.

Hence by keeping above problem statement, This study is justified because minor floods are among the most frequent natural disasters that cause greater economic losses and difficulties to human activities. In addition, this study is not only focused on regulation and monitoring of flood water but also emphasis on how effectively this water can be used when it is required.

Objective:

1.To develop and fabricate Flood Regulating Discharge drains with automated discharge gates in correlation with water storage sub terrestrial tanks using Sensor Modules and real time analysis of flood in the drains

2. Practical Validation of the working Model

Methodology:

1. Sub terrestrial tanks are constructed in parallel to drains and they are connected with small flood gates.

2. The sensors are installed in the drains which measures stage wise the water level in the drain. It periodically or continuously monitors the water level by measuring the electrical resistance between its probes.

3. The sensor is connected to a control system; The control system receives the water level data from the sensor and compares it to a predetermined water threshold limit.

4. Based on the comparison between the measured water level and the threshold limit, the control system determines whether to open flood gate need to be open or not After opening the gate. When tanks reach its capacity, the pump gets activated, it pumps out the water from the sub terrestrial tank to the nearby lakes or connecting sub terrestrial tanks through a channel.

5. All the operations are done in Automatic sequence

6. All the data will be fetched in real time action

Results And Conclusions:

- The fabricated minor flood control discharge model has been well executed & it shown that flood control gates were open instantly when water level reaches to threshold depth.
- The depth of water in the drains analyzed in stage wise pattern and it is clearly shown by LED indicators instantly.
- Based on the number of the Sub terrestrial tank, the water storage can be increased which can be used effectively whenever required.

- ❖ The flood gates were automatically operated by the use sensor modules by detecting the total amount of water in the underground tank, and when the tank crosses threshold limit, automatically the pumps start to pump out the water from the underground tank to the nearby lakes.
- ❖ The entire automated real time operation was monitored automatically
- ❖ This is how the advanced minor flood monitoring discharge channel Model was developed in the current investigation. This concept may be successfully used to store water as well.

Innovation In the Project:

In this project we have focused majorly on analysis of flood water in the drain knowing the stage wise depth in turn correlating to automated flood gates based on the depth of the water & Sub terrestrial tanks with real time analysis of the same through system application so the overflow of water can be avoided during minor floods.

Scope For Future Study:

1. The concept may be implemented for moderate to larger floods to know practical feasibilities, as of now we have designed for minor floods. The same design can be used to develop a working model for moderate to larger floods & also need deeper investigation for practical consideration.
2. We have developed a prototype working model. Same application can be implemented in site and larger investigation is required for site conditions.