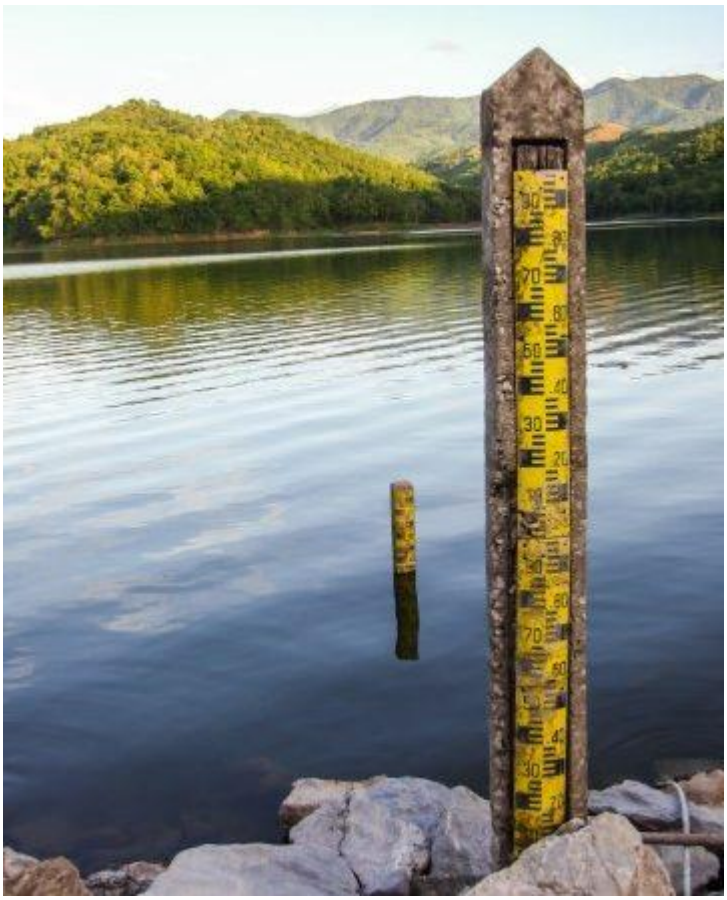


WATER LEVEL ALART SYSTEM.

Randunu Bandara 806

Thushan Devinda

Top level user Requirements.

User requirements of the rainfall monitoring system

- User wants to know whether it is raining for the catchment areas.
- The rainfall report of a day for the catchment areas of the reservoir.
- The rainfall report of a day for a selected area of the catchment areas.
- The rainfall report for a selected duration.
- User wants to know whether the rainfall rate is high and is it greater than the threshold level.

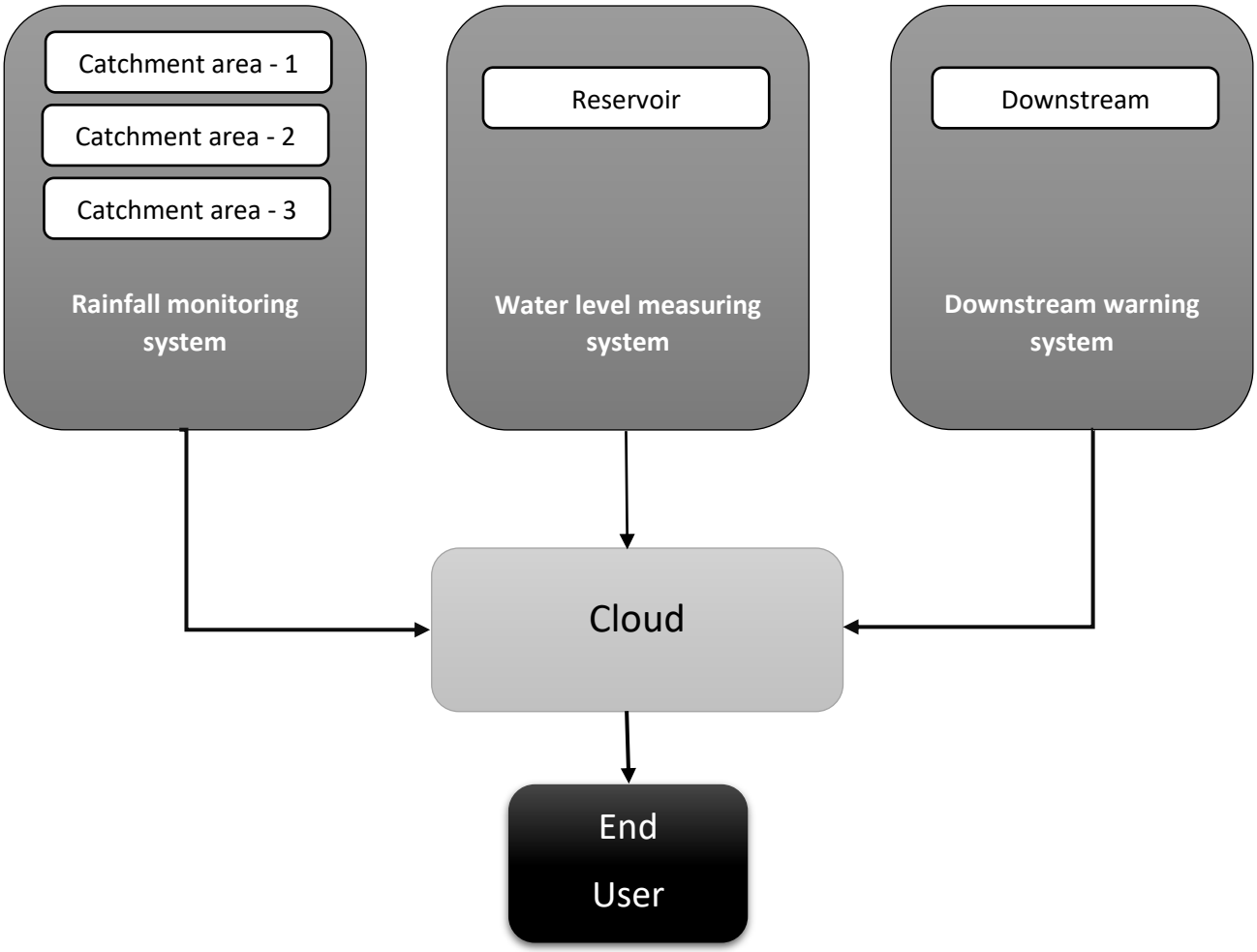
User requirements of the water level measuring system of the reservoir.

- Water level of the reservoir.
- Water level increasing rate of the reservoir.
- Estimate time to reach the water level to the critical level.
- User wants to know the time to open the gates of the reservoir.
- User wants to know the time taken to get the revivor overflowed.

User requirements of the Downstream warning system.

- Get messages regarding the operation of the Dam. (whether the dam is close or open)
- Get warnings if there is a Flood risk.

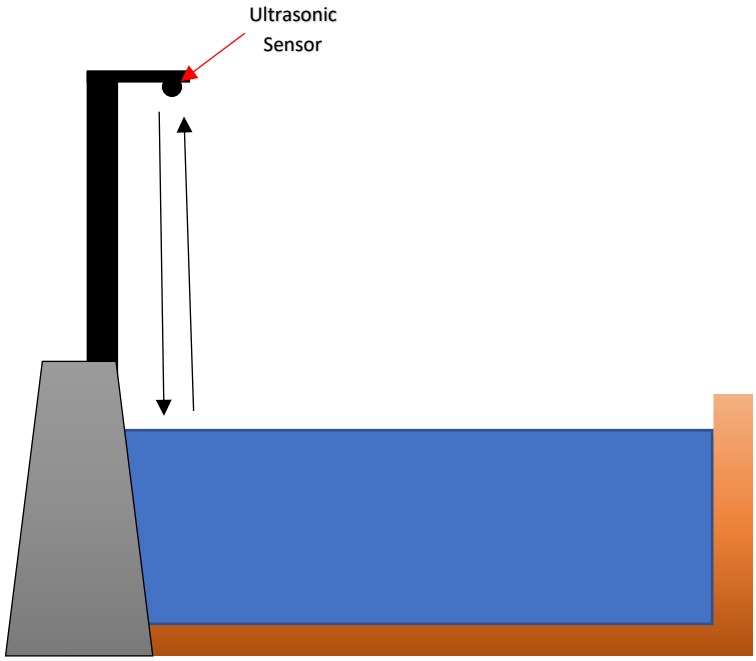
Top level Diagram for the system.



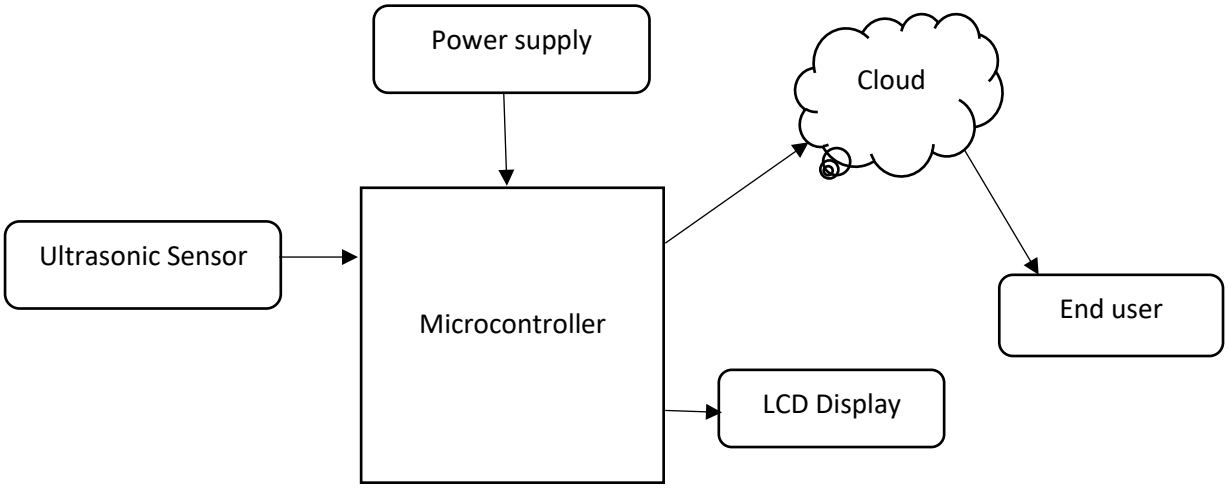
We can divide the system in to 3 main sub systems.

1. Rainfall monitoring system.
   This is to monitor the rainfall in the catchment areas of the reservoir.
2. Water level measuring system.
   This is to measure the water level of the reservoir.
3. Downstream warning system.
   This is to give warnings to the users if there is any danger.

Measuring the water level of the reservoir.

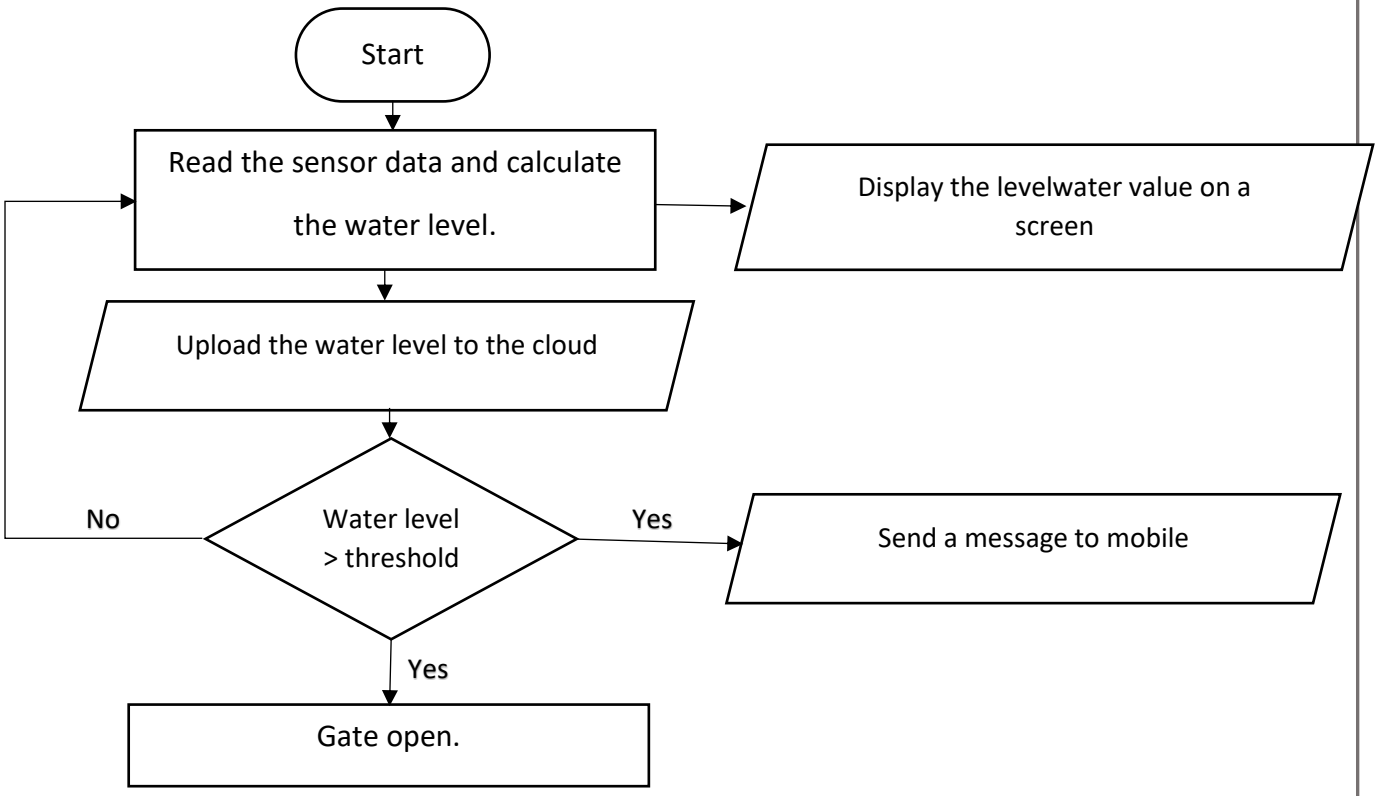


To measure the water level of the reservoir we can use Ultrasonic Sensors. Ultrasonic sensors are reliable, cost-effective. To determine the distance to water, these sensors transmit a sound pulse that reflects from the surface of the water and measures the time it takes for the echo to return.



Software Design.

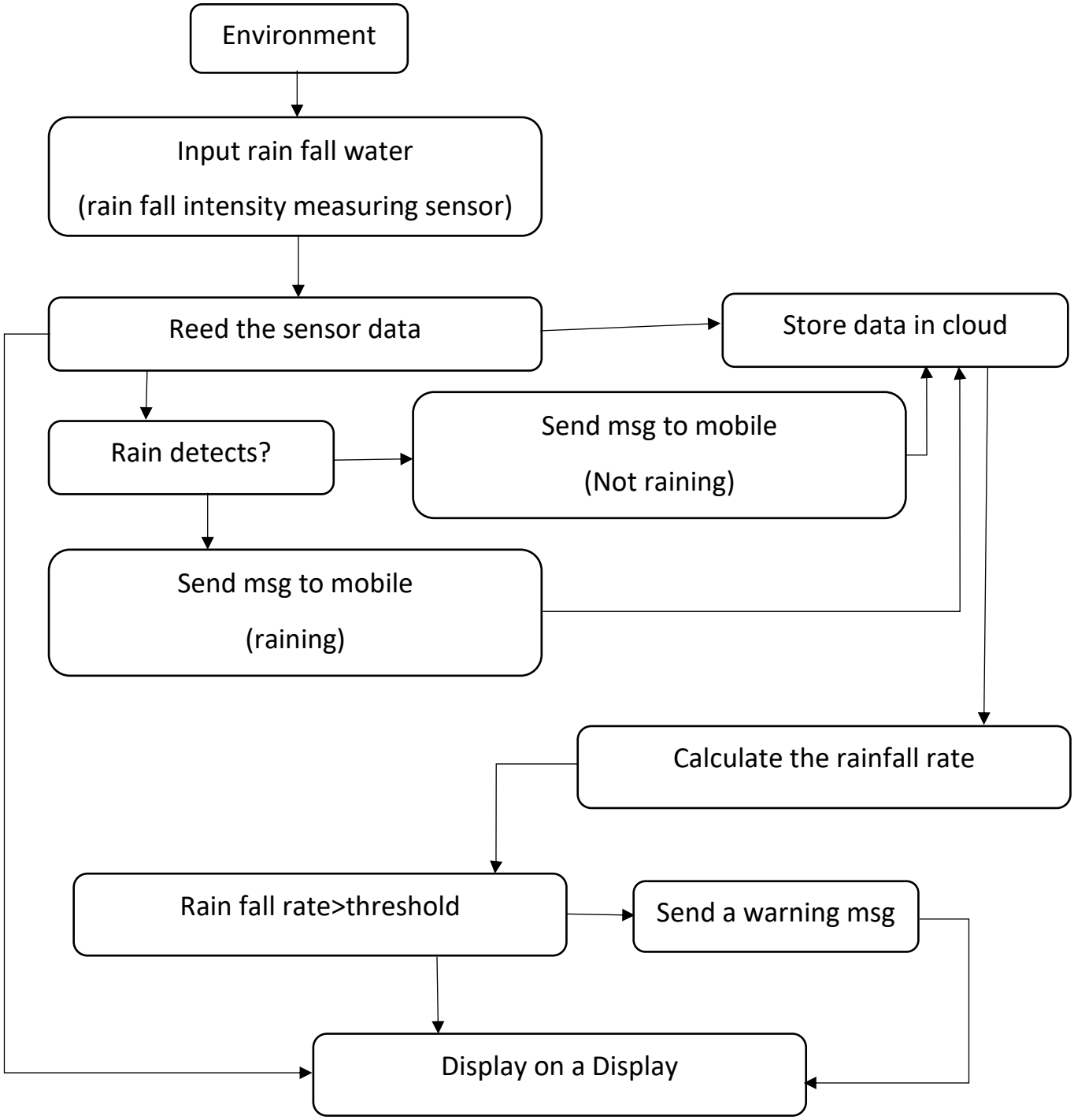
With the data collected by the sensor, we can calculate the water level of the reservoir. Then the water level can compare with the threshold level. If it reaches the threshold level a message is going to the user and we can open the gates of the dam and release the water. And also, we can calculate the flow rate, time taken to get overflowed, pre-release water quantity and rate with the data that stored in the cloud. In the same time those calculated values can be display on a screen too. Consecutively, the system gives further alert when the possibility of danger increases. So, this system ensures the public safety.



power sources

- Here for the sensors and microcontrollers that are in the environment we can use solar power.

Rain fall monitoring system.



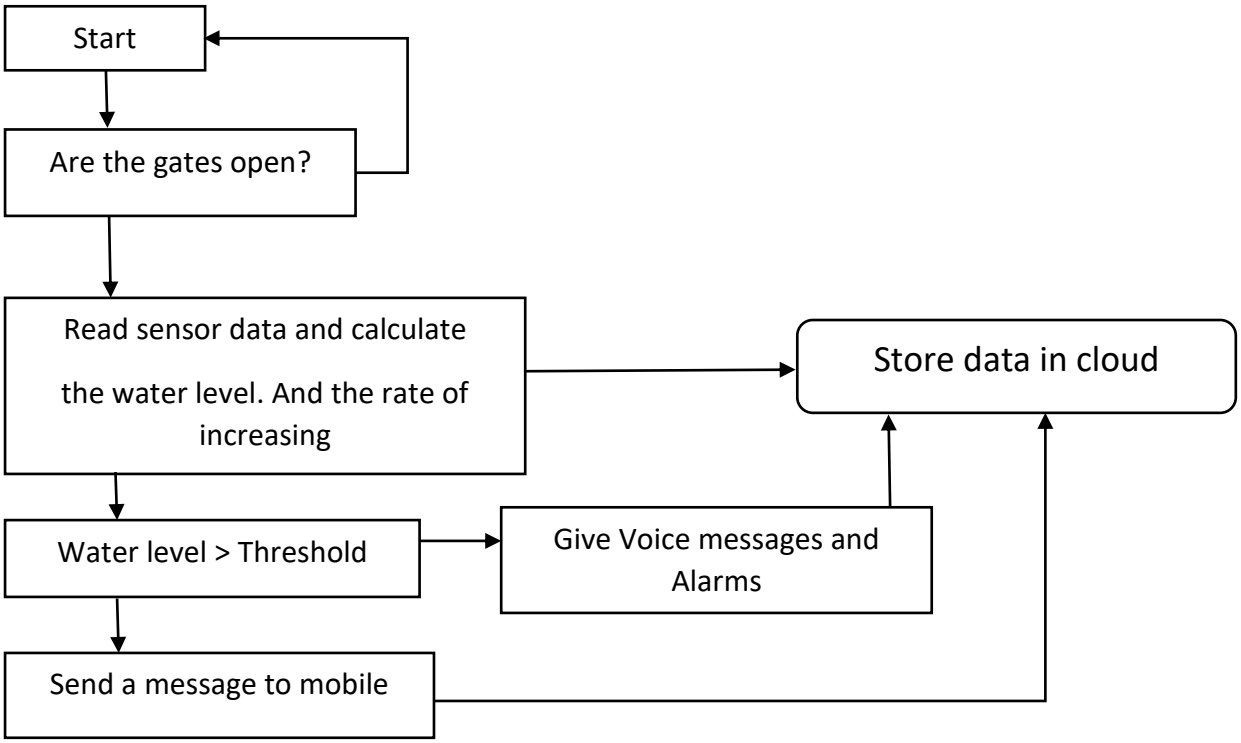
We can place those kinds of rainfall monitoring systems at all the catchment areas of the reservoir and can get the values of the rain fall in every half an hour. If there is a rain detected, we can change the system software to get the values continuously and we can calculate the rainfall rate. At the same time, we can send a message to the end users too. If there is a high rainfall rate and that is over the threshold, we can also send a warning message to the end users too. All the data are stored in the cloud so any time the end users can analyze any data related to the rain fall.

power sources

- Here also for the sensors and microcontrollers that are in the environment we can use solar power.

Downstream water level monitoring and waring System.

When the water level of the reservoir goes up, we need to remove the excess water from the reservoir for the protection of the dam. So, we need to open the gates of the dam. When we open the gates, the excess water goes to the downstream. If the downstream water level goes up, there is a high risk of occurring a flood to the people who live near the downstream. So, from our system we need to measure the water levels of the downstream and we need to give pre warning to those people for the protection of them.



If the gates are open, we can read the sensor data and calculate the downstream water level and also the rate of increasing of the water level. Then after comparing the sensor values with threshold value if the water level is higher than the threshold level, we can send messages as well as we can give voice mages to the people through loud speakers.

power sources

Here also for the sensors and microcontrollers that are in the environment we can use solar power. And for the loud speakers also we can use solar power.

Possible errors

- Water level measuring system.