SMART CITY RAIN WATER HARVESTING (IOT) TECHNIQUES

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Abstract: **Rainwater harvesting is collected in the containers before raining down to ground level and collecting it. The rainforest can be used for irrigation, not only for drinking water and livestock, but also for the storage of rocks in the ground. Rainwater harvesting is a method from the roofs of buildings. India gets the most elevated precipitation among nations practically identical to its size. Its landmass has perfect and enduring waterways confusing it – especially through the northern part. In any case, the opposite side of the story is this: some piece of India has kept on encountering dry spell conditions with a disturbing consistency. The waterways have been going away and getting dirtied. The underground water tables are contracting quickly. On the off chance that water administration isn't agreed the significance it merits, the nation can especially hope to wind up in grieved waters as the years move by. Assessments of the Central Ground Water Board are that the repository of underground water will become scarce completely by 2025 in upwards of fifteen States in India – if the present level of abuse and abuse of underground water proceeds. By 2050, when more than 50 for every penny of the Indian populace is relied upon to move to the urban areas, crisp drinking water is required to get rare. Another class of evacuees is relied upon to develop around that time: the water transients. Future wars, between or inside countries will be battled on the issue of water. So need to rain water harvesting ,In this project, a smart centralized rain water harvesting project was using to save the rain water process and using more sensors (rain water sensor, ultra sonic sensor),and Arduino. Arduino is the micro controller. This project main point of use to rain water saving.**

Keywords: **Rain water harvesting management system, Arduino, LED display, rain water sensor processing, stepper motor function,intenet of things(IOT),gsm module(Global System for Mobile Communications),water level sensor.**

I. INTRODUCTION

The main query is what's implied via a 'SMART CITY'. The suitable response is, there may be no all around acknowledged meaning of a awesome metropolis. It implies one of a kind matters to various people. the conceptualization of clever town, eventually, fluctuates from town to town and kingdom to state, contingent upon the extent of development, readiness to trade and alternate, property and dreams of the town population. a eager town could have a numerous implication in india than, say, europe. Certainly, even in india, there may be no person approach for characterizing a sensible metropolis. Some definitional limits are required to direct urban communities inside the undertaking. Within the innovative power of any town tenant in india, the photograph of a shrewd town incorporates a listing of things to get of framework and administrations that depicts his or her level of craving. So the smart city major problem is rain water harvesting, The annual inter-State feuds over water are becoming more and more common in India. Per capita water availability in the country which was 5,000 cubic meters earlier, has dropped to 2,200 cubic meters. This is against the world figure of 8,500 cubic meters. As a result, India is fast approaching a phase of stressed water availability conditions. Several perennial flows like the Ganga-Brahmaputra-Barak are becoming seasonal. Rivers are dying or declining and aquifers are getting over-pumped. Thus, people have to depend on limited municipal water supply. Consequently, they are forced to rely on their own resources. This scarcity has led to the birth of water markets with private entrepreneurs doing business in supplying water tankers. This, once again, is putting pressure on surface and groundwater sources which are fast depleting all over the country. Eighty-five per cent of India's urban population has access to drinking water but only 20 per cent of the available drinking water meets the health and safety standards. Furthermore, there are serious inequities in the distribution of water. Consumption of water ranges from 16 liters per day to 3 liters per day depending on the city and the economic strata of the Indian consumer. The water in rivers is wasted as it flows into the sea and is not properly harnessed. The debate on dams as a means of harnessing water continues to make this issue politically and environmentally sensitive. No clear ecologically stable and financially viable solution has emerged. The poor state of local and municipal authorities renders them unable to provide basic water to the cities. Strengthening of local bodies could lead to another means of addressing this issue.

SMART CITIES

Improve infrastructure and services. Complete development in this manner will the goal of the smart cities challenge is to sell towns that offer core infrastructure and supply a respectable nice of life to its residents, a clean and sustainable environment and application of 'clever' answers. The focus is on sustainable and inclusive improvement and the concept is to examine compact areas, create a replicable version so one can act like a mild house to other aspiring cities. The smart cities venture of the authorities is a formidable, new initiative. it is meant to set examples that can be replicated both inside and out of doors the clever city, catalyzing the creation of comparable smart towns in numerous areas and components of the USA. Consequently, the purpose of the clever town's task is to drive economic boom and improve the best of life of human beings by using enabling neighborhood area development and

harnessing generation, mainly generation that ends in clever outcomes. Area-primarily based improvement will transform present areas (retrofit and redevelop), along with slums, into higher deliberate ones, thereby enhancing livability of the entire city. New areas (Greenfield) may be advanced round towns which will accommodate the increasing population in city regions. Utility of clever answers will permit towns to use technology, records and statistics to enhance best of life, create employment and decorate earning for all, especially the negative and the disadvantaged, main to inclusive towns.

II.METHOD
EXISTING METHOD

The first thing you need to consider in constructing a harvest system is the collection area, storage devices and delivery system. The collection area is anywhere where the rain showers do not fall on the earth. It can include the roof of your house. You need to find out how to do rainwater harvesting by discovering the amount of water that your roof can capture and how much water you need. A farmer who is located in an arid area with a large landscape of plants will need more water compared with own who has a small vegetable yard. The more drums that you have the more rainfall you will capture. The storage devices can either be containers or drums. You also have the option of constructing your own. In either ways, the main aim is to ensure that they are located appropriately. It is good to place it near the place where water is needed most. Dig a three inches extent and broadness of your cinder block bottom. Put gravel in the area up to a level of a third of it. This is so as to make sure your foundation is water-free all the time by flattening the cinder blocks. The more you raise the drums the better because you will get more pressure while tapping the water. Sometimes rainfall can be excess and the drums will overflow. The gravel beneath the cinder blocks will redirect the water from the bottom. This is depicted in figure .1
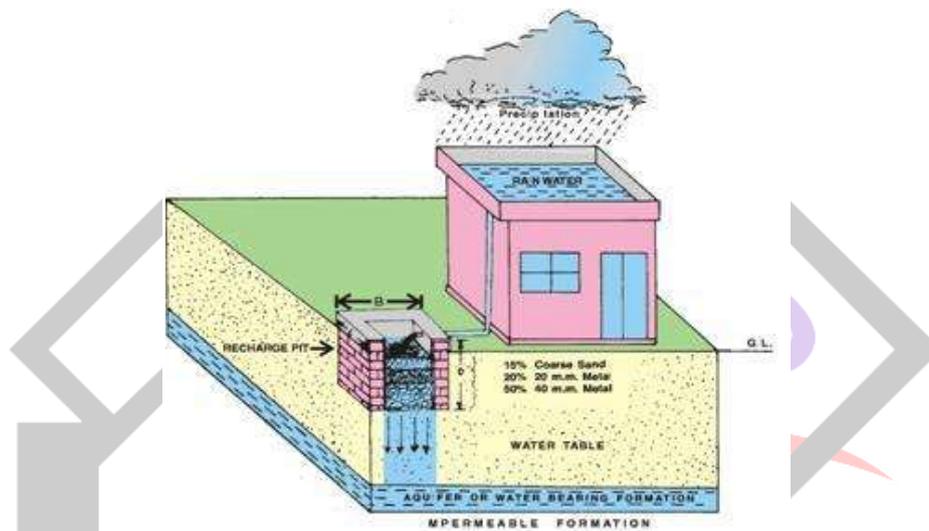

Fig1.existing method of Rain water harvesting

FEATURE OF RAIN WATER HARVESTING
- The cost of recharge to sub-surface reservoir is lower than surface reservoirs.
- The aquifer serves as a distribution system also.
- No land is wasted for storage purpose and no population displacement is involved.
- Ground water is not directly exposed to evaporation and pollution.
- Storing water under ground is environment friendly.
- It increases the productivity of aquifer.
- It reduces flood hazards.
- Effects rise in ground water levels.
- Mitigates effects of drought.
- Reduces soil erosion.

ESSENTIAL THINGS OF SMART CITY

- To overcome the inadequacy of surface water to meet our demands.
- To arrest decline in ground water levels.
- To enhance availability of ground water at specific place and time and utilize rain water for sustainable development.
- To increase infiltration of rain water in the subsoil this has decreased drastically in urban areas due to paving of open area.
- To improve ground water quality by dilution.
- To increase agriculture production.
- To improve ecology of the area by increase in vegetation cover etc.

ARDUINO AND SENSOR DEVICE

Arduino provides a number of digital and analog inputs which is used to connect to the computer and for communicating among systems using a standard protocol. This runs in the standalone mode and its low cost and open-source hardware. The Arduino sensor device is easy to access and flexible to use. Sensor device is an electronic device that measures a physical quality such as light or temperature and converts it to a voltage. Transduction is the process of changing the energy from one form to another. It is also called as transducers. Sensors are of two types namely digital sensor and analog sensor. In digital sensor's have two states such as ON (1) or OFF (0). This is depicted in figure.2. When the circuit is closed [Normally Closed (NC)], the current flows through the circuits and circuit is opened [Normally Open (NO)], there would be no flow of current. This is depicted in figure .2.
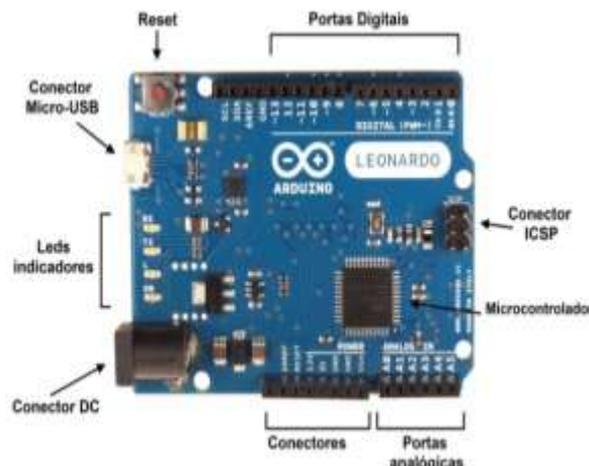

Figure 2.Arduino and its parts

II.PROPOSED MODEL FOR RAIN WATER

HARVESTING SYSTEM IN SMART CITY

Water is our most precious natural resource and something that most of us take for granted. We are now increasingly becoming aware of the importance of water to our survival and its limited supply, especially in such a dry continent as india.The harvesting of rainwater simply involves the collection of water from surfaces on which rain falls, and subsequently storing this water for later use. Normally water is collected from the roofs of buildings and stored in rainwater tanks.
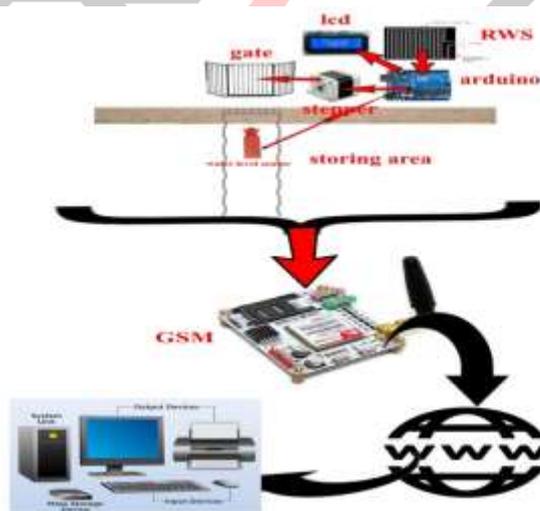
A.DESIGN OF PROPOSED MODEL

FIGURE.3.PROPOSE MODEL RAIN WATER HARVESTING

This project can be developed using the arduino micro controller which is economy based one and its performance is high. For this project the Ultra sonic sensor, stepper motor, water level sensor and the rain water sensor has been connected along with the Arduino micro controller. Whenever the rain water has been drizzled on the rain water sensor, a door attached to the big pit will be opened

and the compound gate around the pit has been raised up in order to save the human error by mistakenly fell down in to the Pit. An ultra sonic sensor and the water level senor which computes the water level stored in the pit as a information and all the information generated by the sensor has been forwarded to the TWAD board with the help of GSM Module along with the Internet. In current Scenario the water is one of the most considerable problems for the human beings. According to the report 72% of water has been mixed westerly to the sea and drainage and 42% of people who have been struggled a lot for collecting the drinking water by walk to a long distance. This project is designed to reduce the water problem by 39%. The main benefit of this project is, it is more efficient than the home based rain water saving system. And another main advantage is the pit will observe the rain water even though it is enormous. If this project is exist at the time of Chennai flood it would saved the people by maximum. Also the project has been placed wherever the water has been stored in street or some other places. This is depicted in figure .3.

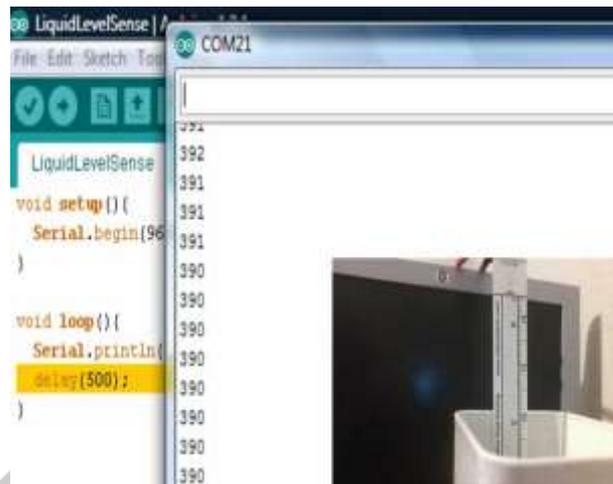**B.RESULT & DISCUSSION**

RESULT:

Figure .4.Result of the water level details

This is depicted in figure .4 Arduino is connected to rain water sensor ,when the rain starts (when the water is droped) Rain water detector sensor will automatically open the pit, and water level sensor is attached inside the pit.The water level sensor is to find the water level and when the pit is filled ,automatically gsm module send the informations to the water board and finally pit will be closed.

The result is arduino serial monitor was updated to the water level. Future work will be camera monitoring and human alert method.

CONCLUSION

This paper concept, there are many researches are going frequently. Internet of Things (IoT) addresses the network perspective of rain water harvesting. Peer to peer communication defines future internet addresses of rain water harvesting. Each and every things of rain water harvesting have many complicated questions and open issues like scalability, privacy and security etc…In this proposed model has been developed to overcome the water issues with sensor detection device and sensor chips. Every essential things of rain water harvesting could provide the attractive and pleasant environment to different type of personalities. In this system, the processes will automatically takes place without the help of users and the water level details will be stored in the computer system permanently. Whenever the water board needs, that can utilize the accurate date of the rain water movements will be tracked easily. The Future work will be camera monitoring it is nothing but just watching the level of pit and to monitor the damages occurred in the pit. Human alert method was vigilance when the humans crossing the pit this can be also done by using **IR** sensor.

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