

# WASTE WATER MANAGEMENT FOR SMART CITIES IMPLEMENTATION WITH HELP OF INTERNET OF THINGS AND PIC CONTROLLER

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**ABSTRACT** -Water is a key aid for existence on earth. Clean Drinking water is one of imperative human needs. With the expand in urbanization a chance of water scarcity is alarming. This triggers the idea of reuse and recycling of waste water. This paper provides the need for waste water treatment and additionally gives the brief description of more than a few degrees of waste water treatment. The waste water treatment plan works optimally only under certain parameters. Hence sensors can be used at specific degrees of water remedy for automation. This paper presents the significance and necessity to recycle the waste water and provides results for automation of waste water remedy plant.

## 1. INTRODUCTION

Water is one of the most vital natural resources. Without it no life exists on the earth. Up to 60% of human body is water. Hence the quality of water we consume is very important. The World population is expected to increase from 6.8 to 9.1 billion between 2009 and 2050. The urban population is also projected to 6.3 billion in 2050. This projection shows that the urban areas all over the world would have tremendous increase in population growth in the next 40 years. It is expected that the urban population would be 3.9 billion in developing countries and 1 billion in developed countries. With this we could say that the population growth is an urban phenomenon predominantly in developing countries. With increase in urban population the waste water generated by them would also be increased. The urban waste water when combined with untreated industrial waste could be very dangerous. The Rural population and the slums in the city consume the water from open sources like rivers since they don't have access to treated water. Hence the waste water treatment is the need of the hour. The waste water must be treated before leaving into them into rivers. 43 countries are presently facing the problem of water scarcity. Hence it can be considered that waste water treatment is a great necessity for smart cities.

### 1.1 NEED FOR WATER TREATMENT

Waste Water contains a variety of organic and inorganic substances dissolved which also includes toxic elements such as Cadmium(Cd), Zinc(Zn), Copper(Cu), Chromium(Cr), Ar-senic(As), Mercury(Hg), Lead(Pb) etc. These may not be in present in dense concentration to affect human life but may affect plants and animal life. Disposal of the waste water directly into water bodies like rivers and oceans may affect the aquatic animal life. The water in these water bodies are consumed by animals and also by the people living down stream. Consumption of this contaminated water leads to health problems in a long run. The water in a river or lake is normally utilized by farmers for cultivation and the presence of Micro and Macro Organisms in the water affect the agricultural growth.

### 1.2 EXISTING SYSTEM

In Existing systems only the PIC controller is used and authorized person alone can authorize the System so the people cannot get the information without the help of authorized person. In Existing system the information cannot reach to multiple users. There is delay in getting the message in LCD display. Phytoid technology has been used which is not automated. Low accuracy rate. The waste water treatment is not fully automated. Early the sensors like ultra sonic sensor, Infrared sensors as been used but they are not temperature resistant. Small number of people can alone access the information through LCD display.

## 2. PROPOSED SYSTEM

In our work we focus to reduce the scarcity of water in smart cities using Internet of Things (IOT). Our goal is to detect the water condition, whether the water is normal or abnormal using various sensors like ph sensor, water level sensor, gas sensor and salinity sensor to recycle and use for various irrigation purpose. Using IOT, PIC Controller, Cloud, Mobile Application multiple users can access the information from System. The information can reach to multiple users at anytime with help of chrome and application. Using gas sensor we can find harmful gases to avoid dangers in smart cities and people. Completely maintenance free. Reduce pollution and help environment. Simple installation. Long life waste water treatment plant.

### 2.1 SYSTEM ARCHITECTURE

In this diagram the various sensors such as ph sensor, salinity sensor, gas sensor, water level sensor are connected to the PIC controller, the internet of things (IOT) will detect the waste water condition through sensors whether the condition is normal or abnormal by using sensor ranges and the information will get stored into cloud from the cloud the information can be accessed by multiple users through web service and mobile application.

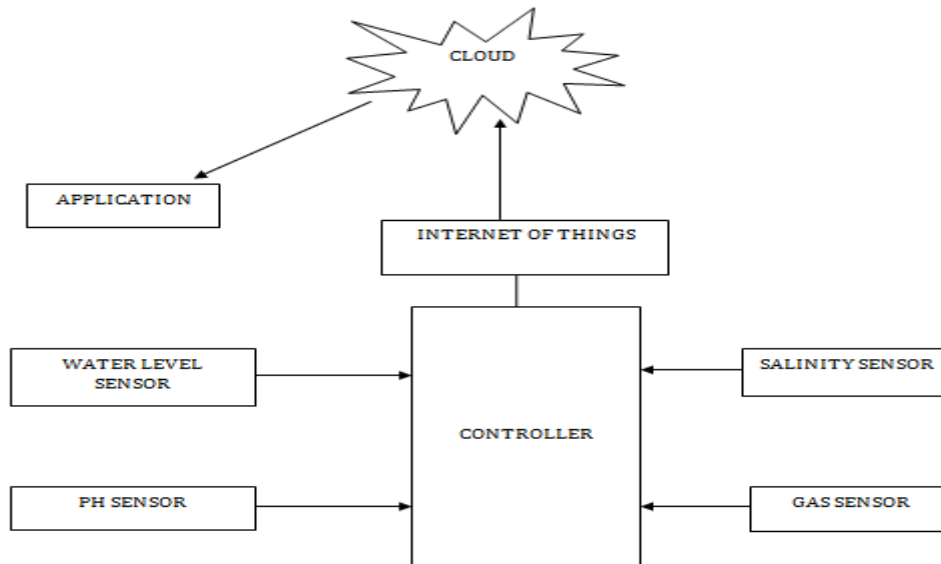


FIG: 1 SYSTEM ARCHITECTURE

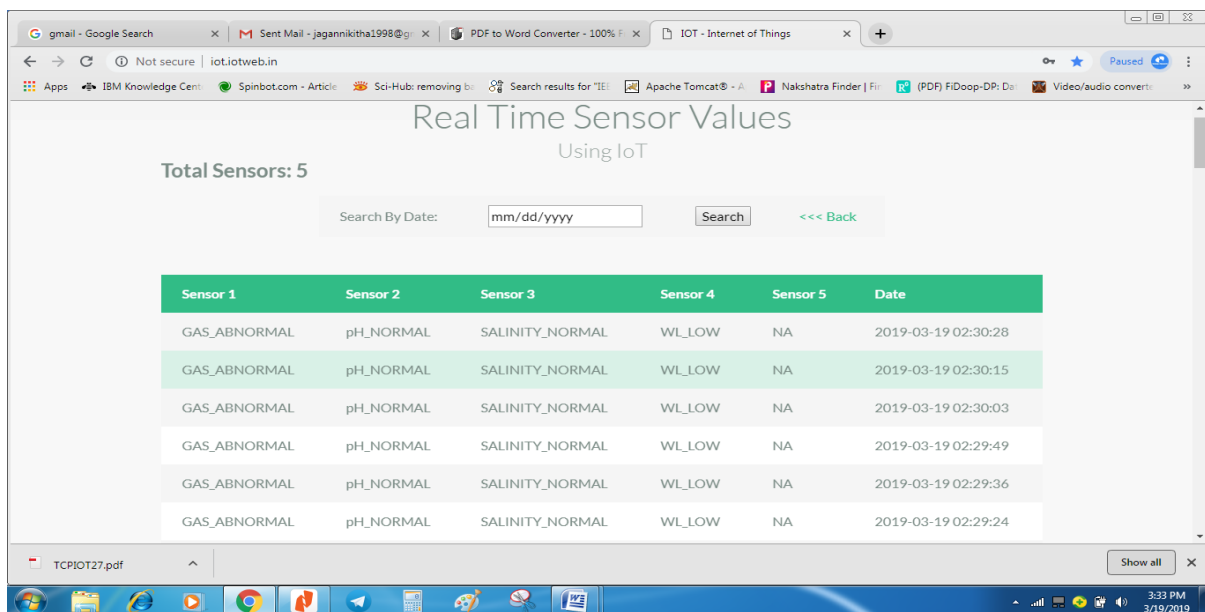


FIG: 2 IMPLEMENTATION DIAGRAM

### 3. CONCLUSION

With the help of various sensors the information will be detected by IOT and the information is stored in Cloud and with help of cloud the information can reach to multiple users at anytime using chrome and application, whether the waste water is Normal or Abnormal. Usage of recycled water for purposes like gardening, flush- ing toilets, watering plants and vegetables, washing cars, cleaning of house and Fire fighting. The reuse of recycled water decreases the usage of drinking water for these purposes which indirectly helps in decrease of water scarcity. The deployment of sensors in the waste waste treatment plan leads to

automation of the plant which leads to efficient use of the plant. By smart waste water treatment biggest challenge of water scarcity for smart cities can be solved.

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