Automated Industrial Water Recycler

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Contents

Abstract

- Wasteful usage of water, climatic changes and Urbanization has further depleted the resource.Conversation and management of the resource must be given utmost importance.
- We present an IoT based design for water monitoring and control approach which supports internet based data collection on real time bases.
- We are monitoring turbidity, PH , and temperature of water(wastage water and purified water). After monitoring them. If water will overflow then the buzzer will work as well as we will got a message on the registered phone number.
- After completing the monitoring process we will go for the purification process. In this process we will remove the poisonous material present in the polluted water by following one by one step involved in the purification process.
- For shortcoming of the existing models for a ubiquitous usage of wireless systems systems for smart quality monitoring and purification.

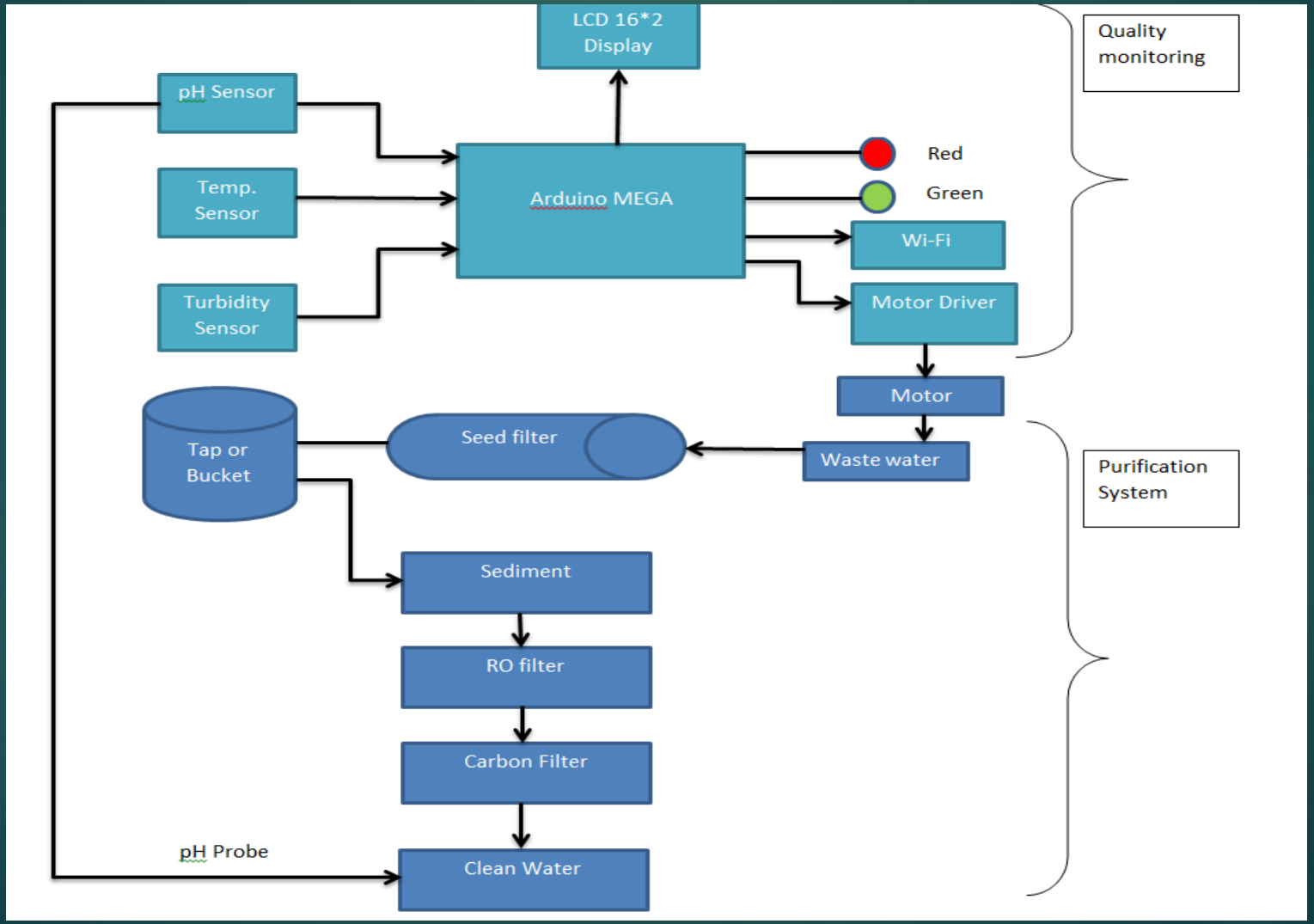
Introduction

- Water is an essential resource for all life on the planet.
- Water is the key to development and sustenance of all communities.
- Water is a basic resource necessary for sustaining all human activities, its provision in the desired quantity and quality.
- Water management regimes aiming at striking a balance between the use of water as a basis for livelihood and its protection to help ensure its sustainability through present to future generations.

Drinking water standards

PARAMETERS	DESIRABLE LIMITS	MAX PERMISSIBLE LIMITS
pH	6.5	8.5
DO	2 mg/l	6 mg/l
BOD	-	6 mg/l
COD	-	250 mg/l
Alkalinity	200 mg/l	600 mg/l
Chloride	250 mg/l	1000 mg/l
Hardness	200 mg/l	600 mg/l

Block Diagram



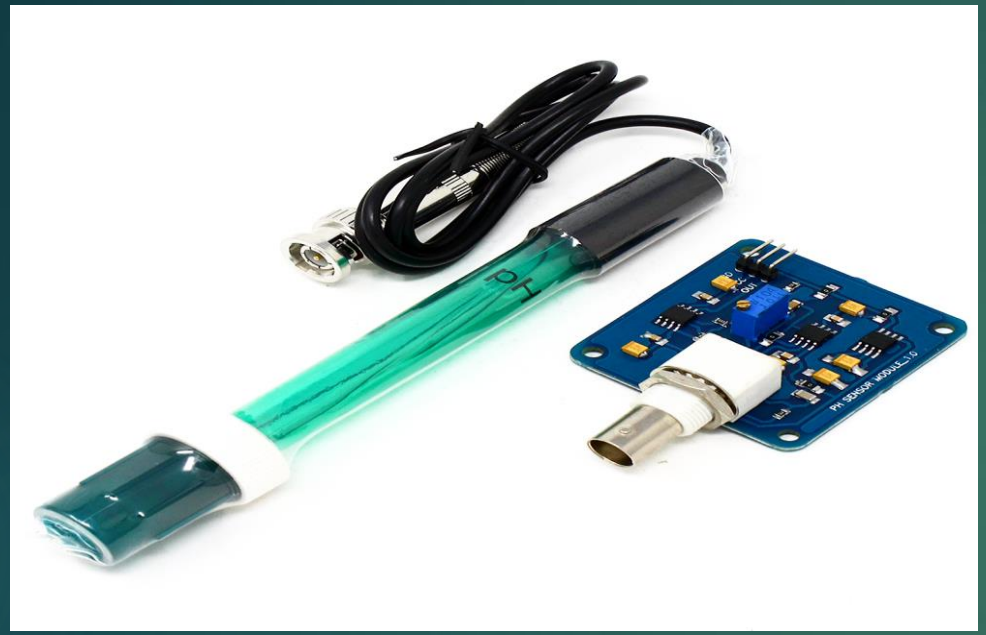
COMPONENTS USED

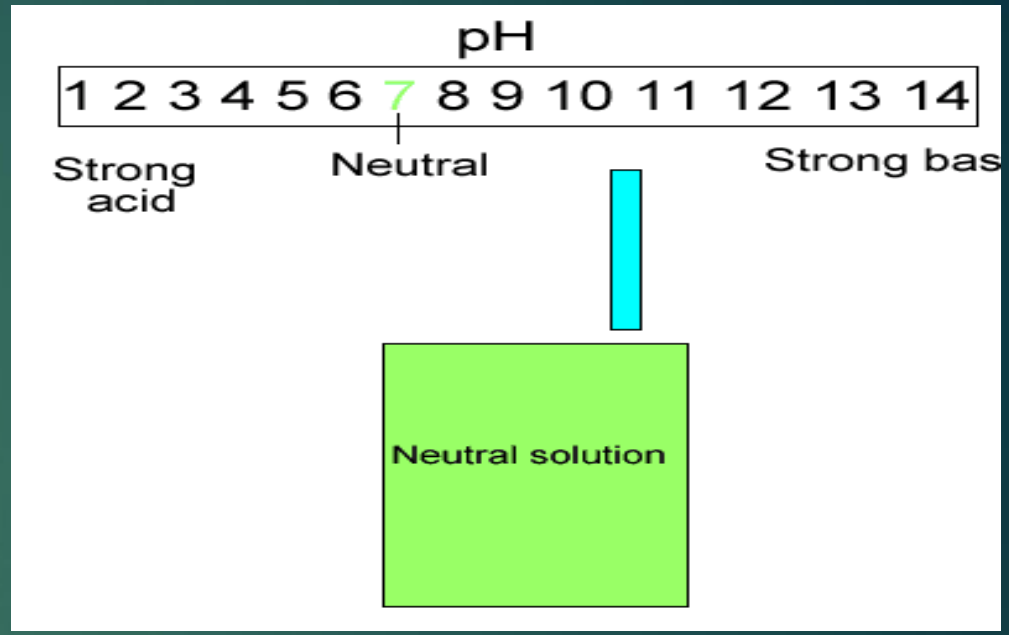
- ARDUINO MEGA 2560
- 16*2 LIQUID CRYSTAL DISPLAY
- ANALOG PH SENSOR(E-201 PH)
- WIFI MODULE
- TEMPERATURE SENSOR(DS1820)
- AN ALARM BUZZER
- SEED FILTER
- SEDIMENT FILTER
- RO MEMBRANE
- CARBON FILTER

Arduino Mega

- Processor : ATmega2560
- Frequency :It provides an oscillating frequency of 16MHZ.
- Flash :It provides 256KB of secondary storage.
- RAM :Having 4KB of temporary memory.
- Pins :It consist of 54 digitally i/o pin structure.
- EPROM :It uses erasable permanent memory of 8KB.
- Voltage :It provides 5V of input supply.

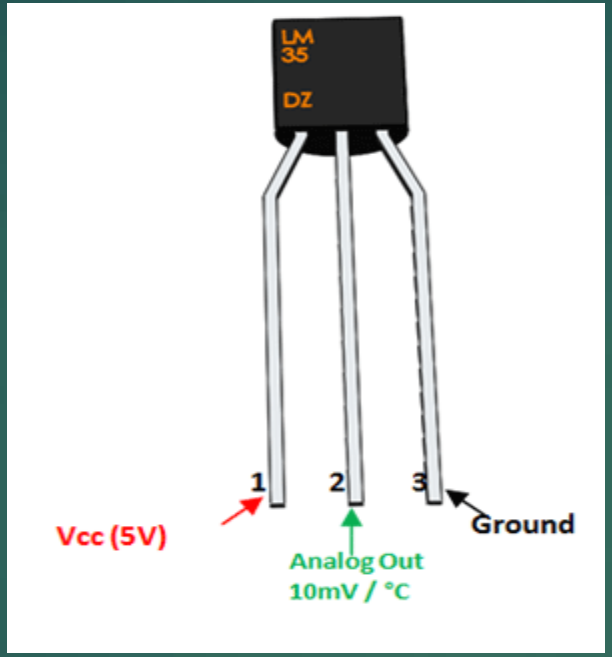
PH Sensor





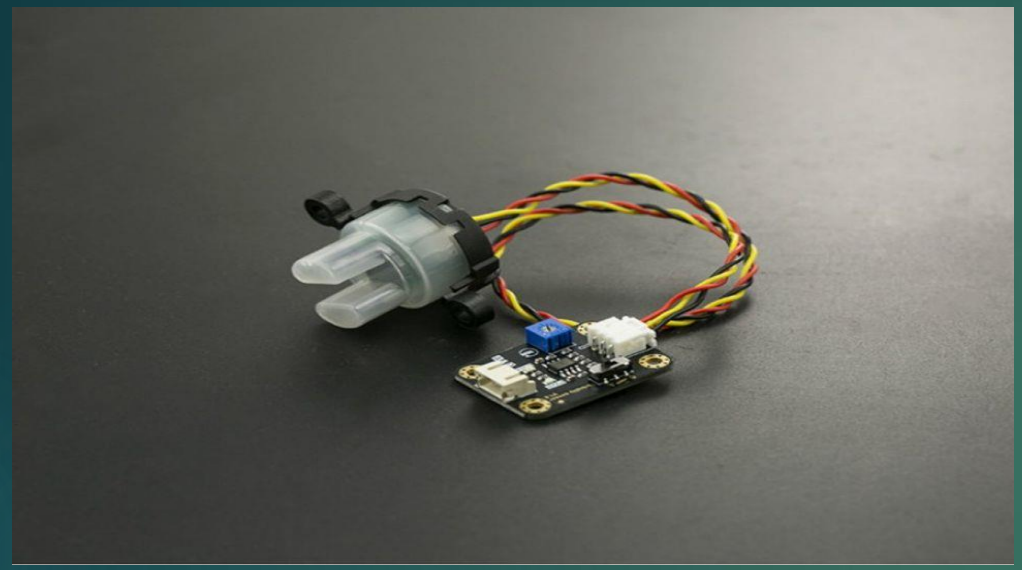
The pH sensor is used for the quality check if water is acidic or basic. A balanced PH level is very important for human health, it should be approximately equal to 7. We are using ETP306 as it is compact and even can be placed in the sunlight. It gives Full range PH reading from .01 to 14.00. It gives a Single reading and continuous reading modes.

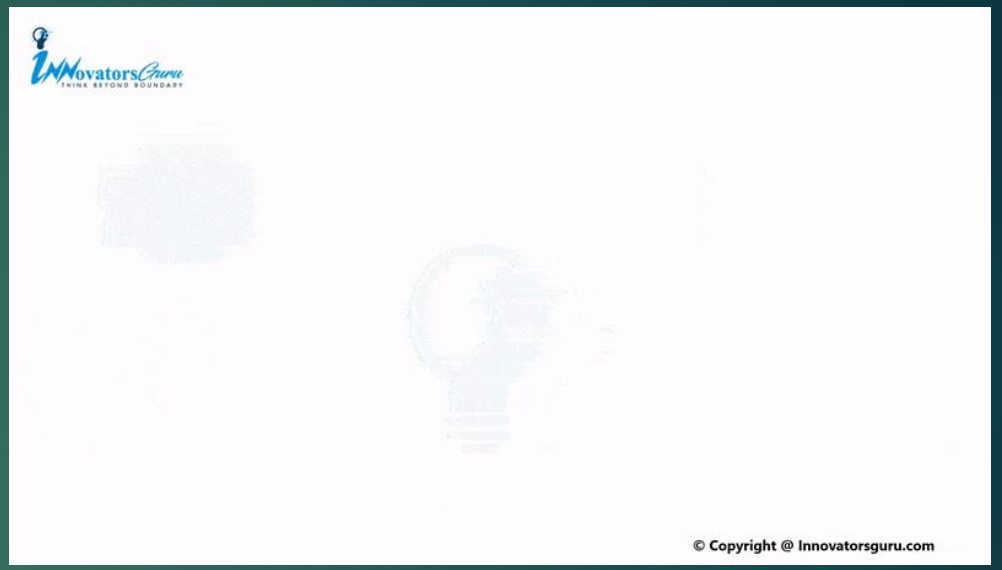
Temp LM35



Temperature sensor LM35 series is precision integrated-circuit temperature device with an output voltage linearly proportional to the centigrade temperature. Basically, it is used to check temperature of the water because temperature for dirty water and for drinking water is different.

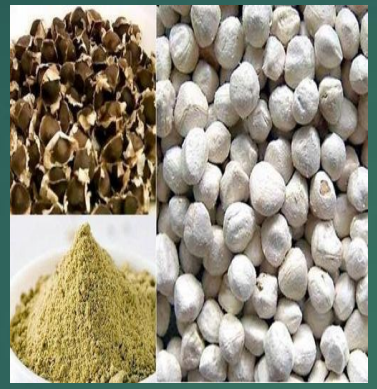
Turbidity Sensor





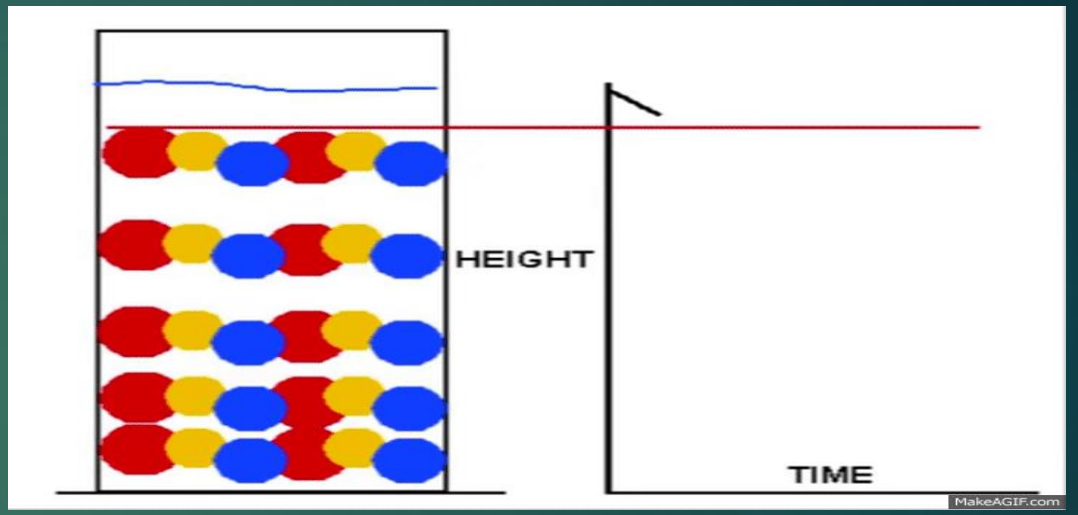
Turbidity sensors measure the amount of light that is scattered by the suspended solids in water. As the amount of total suspended solids (TSS) in water increases, the water's turbidity level (and cloudiness or haziness) increases.

Seed Filter



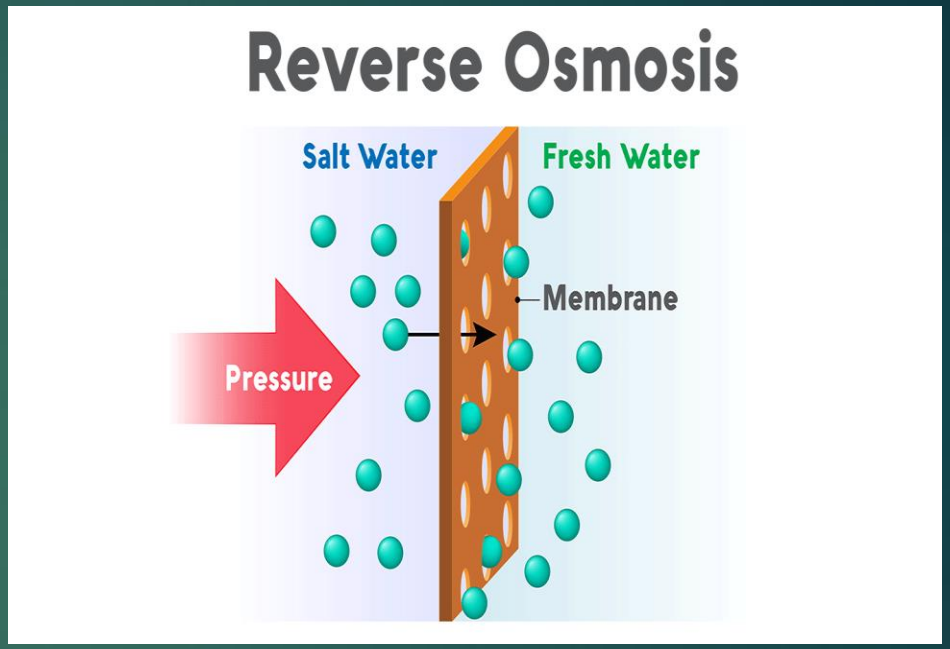
Tamarind seed, rice husk, and drumstick seeds are used for purification purpose. They will used step by step in which they will perform their own role. Rice husk is used for settling the particles present in the water and it also add minerals into the water such as silicon. Tamarind seed is used to remove the chlorine, Fluoride ion and other ions. Drumstick seed is used to remove the dust from the water to secure the RO to chock.

Sediment Filter



Sediment is any particulate matter that can be transported by fluid flow and which eventually is deposited as a layer of solid particles on the bed or bottom of a body of water or other liquid. Sedimentation is the deposition by settling of a suspended material. In a water plant these particles may be rust flakes from the water pipes, sand grains, small pieces of organic matter, clay particles, or any other small particles in the water supply.

RO Filter

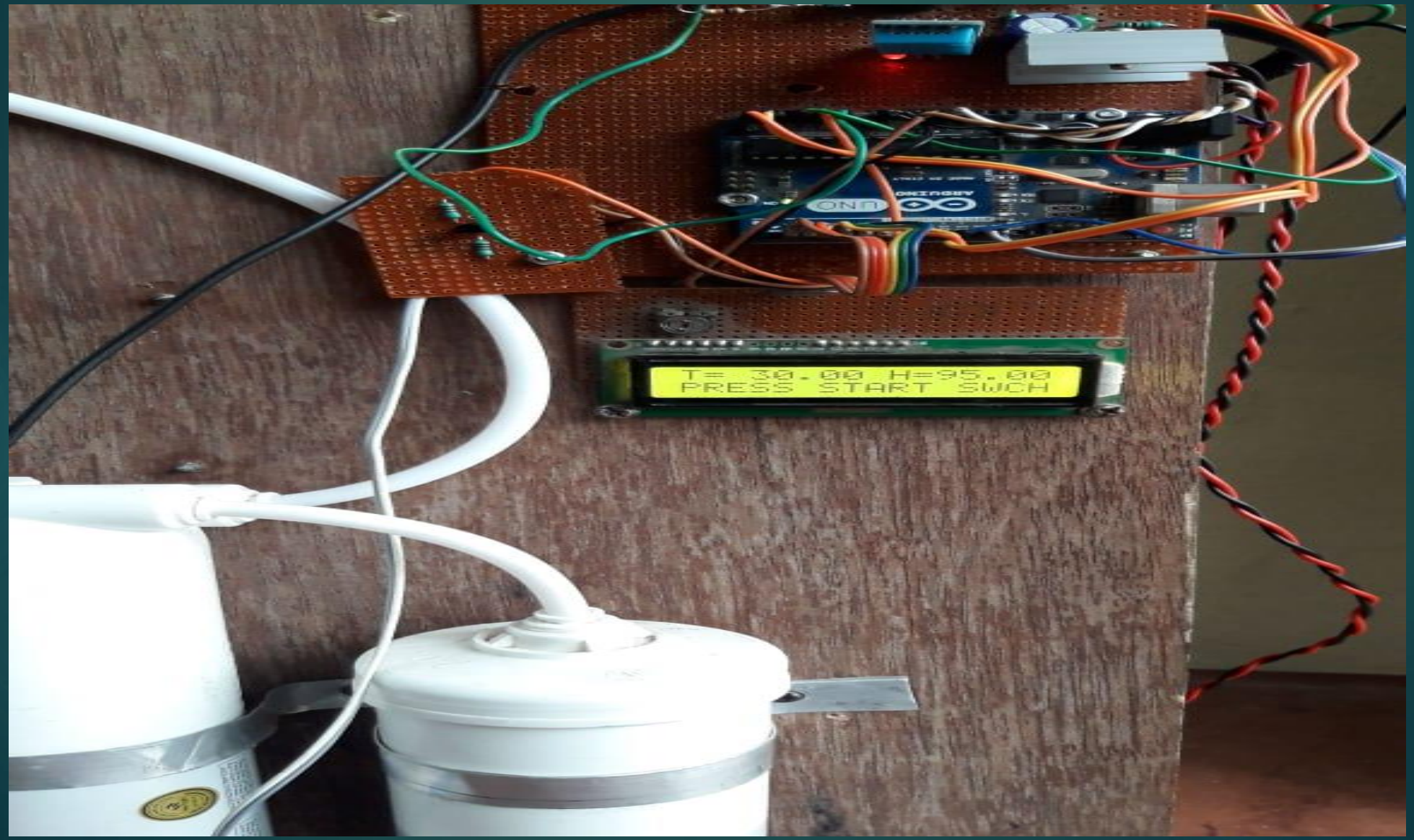


Reverse Osmosis (RO) filtration is one of the most popular and best water filtration methods available. In simple terms, reverse osmosis works as water is forced across a semi-permeable membrane, leaving contaminants behind that are flushed down the drain. The clean drinking water collects in a holding tank.

Carbon Filter

Carbon filtering works by adsorption, in which pollutants in the fluid to be treated are trapped inside the pore structure of a carbon substrate. The substrate is made of many carbon granules, each of which is itself highly porous.

Project Images and Snaps



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Methodology

Wasteful usage of water, climatic changes and Urbanization has further depleted the resource. Conversation and management of the resource must be given utmost importance. We present an IOT based design for water monitoring and control approach which supports internet based data collection on real time bases. We are monitoring PH, temperature of water (wastage water and purified water. After monitoring them, if it will be above from the requirement of normal water which is used for industrial purpose then the buzzer will work as well as we will got a message on the registered phone number. After completing the monitoring process we will go for the purification process. In this process, we will remove the poisonous material present in the wastage water by following one by one step involved in the purification process. First of all we will use the rice husk for removing some chemical substances after that the Tamarind seeds will used for the remaining substances present in the water and at last we used the drumstick seeds for which those substances will be removed which could not removed by the other two coagulants. For shortcoming of the existing models for a ubiquitous usage of wireless systems for smart quality monitoring and purification.

ADVANTAGES

- **New Research and Improvements :-** Wastewater treatment processes are changing as researchers develop new techniques. Such research leads to improvements in purification, the speed of water treatment and uses for the waste products removed. Development of new processes also saves more energy, time and resources, which are then available for other needs.
- **Easy to monitor :-** The task of monitoring can be done by using the less trained individuals. The installation of the system can be done easily when it is near the target area.
- **Recycle :-** Waste water after purification we can reuse. Ex- factories, industries, etc.
- **Economics :-** Jobs are created by wastewater treatment research and processing. Treatment facilities, for example, require regular maintenance and human operation. In addition, returning clean water to rivers and streams helps maintain natural areas, encouraging tourism.

FUTURE PROSPECTS

- In Future, IoT based Water Quality monitoring system can be extended not just for Storage tank but also for deciding on Ponds, rivers and water pipes to.
- The same work can be extended by looking into other water parameters rather than just PH and TDS and accordingly control the flow of water based on water quality.
- In future we can use more advanced IoT based concept in such project.
- Detecting the more parameters for most secure purpose.
- Increase the parameters by addition of multiple sensors.
- By interfacing relay we control the supply of water.


Thank
You