

STUDENT PROJECT REPORT

DESIGN AND DEVELOPMENT OF IoT BASED FISHERMEN

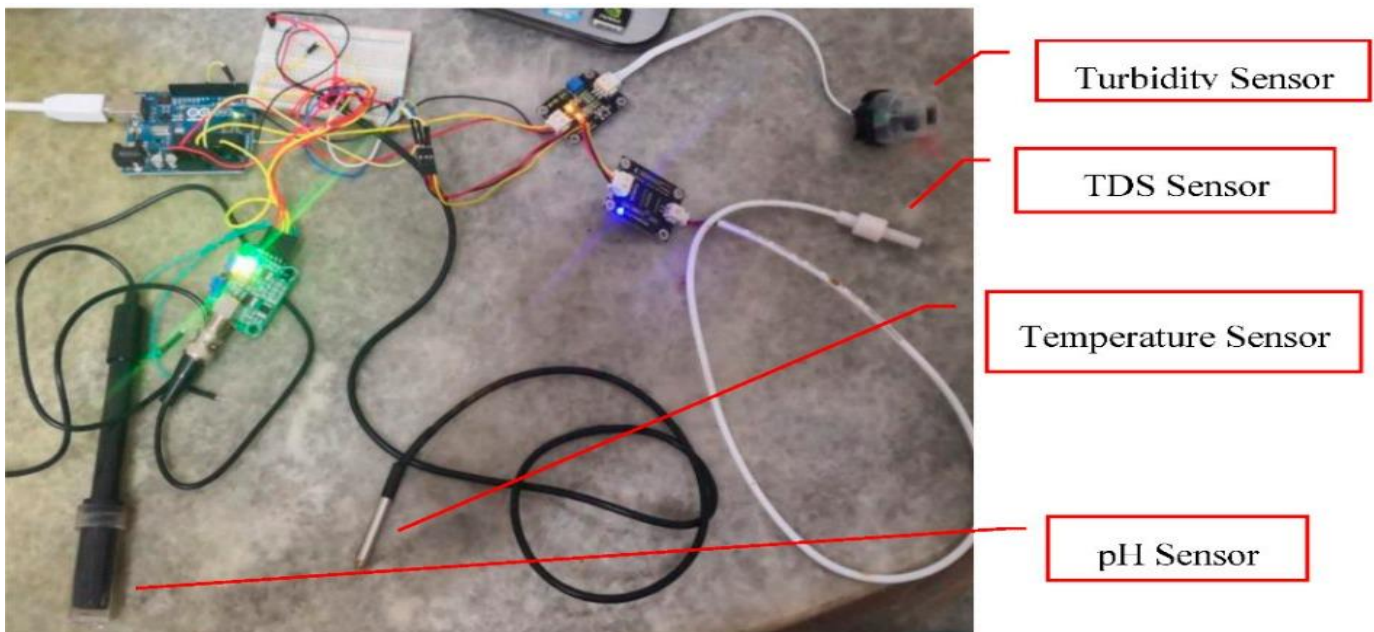
ALARM SYSTEM

INTRODUCTION:

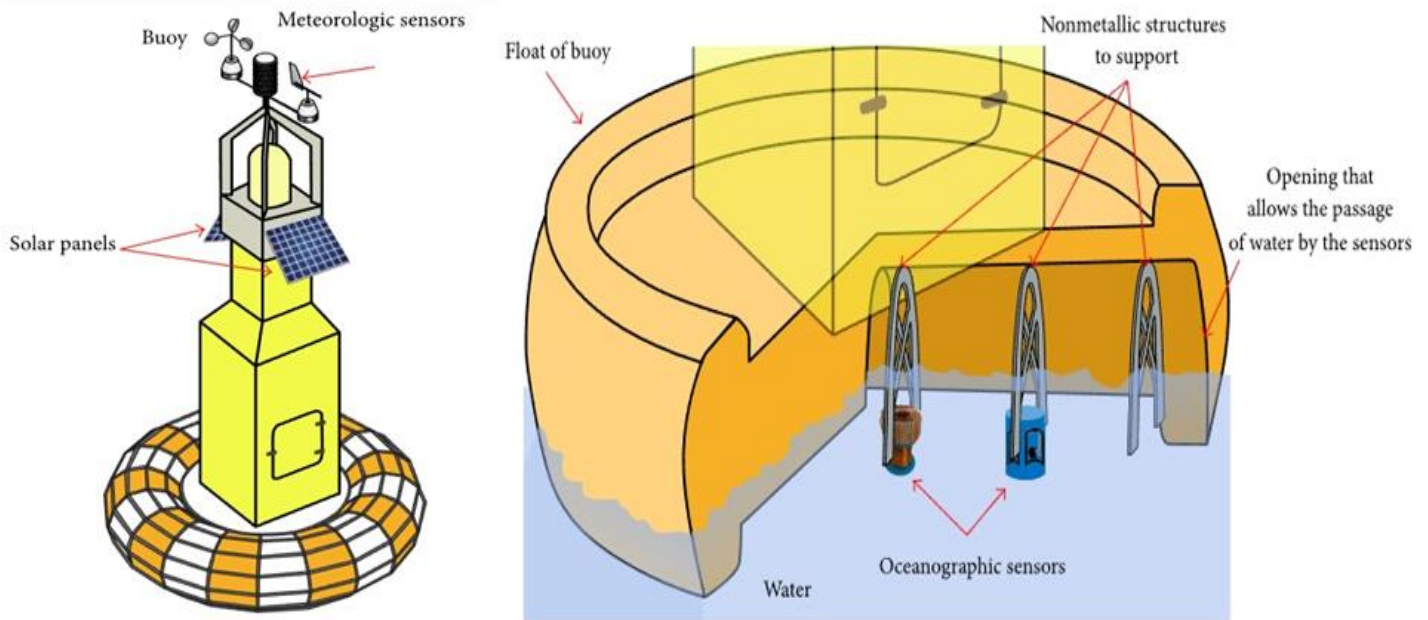
Water is the most quintessential element for the survival of mankind. It remains an important source of food, nutrition, income and livelihood for millions of people around the world. Its variety of uses means that it is always in constant state of demand. In the state of Tamil Nadu, supply of water most primarily comes from large reservoirs of water such as lakes, streams, seas and the ocean itself. As such, it is good practice to monitor the quality of water to ensure it is fit for human consumption. The Current water quality monitoring is often carried out in traditional labs but is time consuming and prone to inaccuracies.

OBJECTIVES:

Our project aims to investigate the feasibility of implementing an Arduino-based sensor system for water quality monitoring. It focuses on the major parameters including pH of water, temperature, turbidity and TDS (Total Dissolved Solids) required for survival of aqua-culture. Rivers are complex life support systems that operate thin line of Sustainability. In the recent history of Tamil Nadu, the sharp increase in the human population has resulted in a considerable increase in the need for freshwater. A water flow driven network can be deployed to reduce the time needed to detect leakage or contamination in urban water distribution system, Water Service industry is heavily influenced by IoT and are able to share information through internet connections.



A model consisting of a micro controller and multiple attached sensors namely the pH sensor, Waterproof Temperature sensor (DS18B20), Turbidity sensor (Value Detection module) and Analog TDS sensor module kit was integrated to conduct the parameters testing on a weekly onsite basis at multiple day intervals. The system works reliably but is reliant on human assistance and is prone to data inaccuracies. The system however, provides solid foundation for future expansion works of the water monitoring category to elevate the system being IoT friendly.

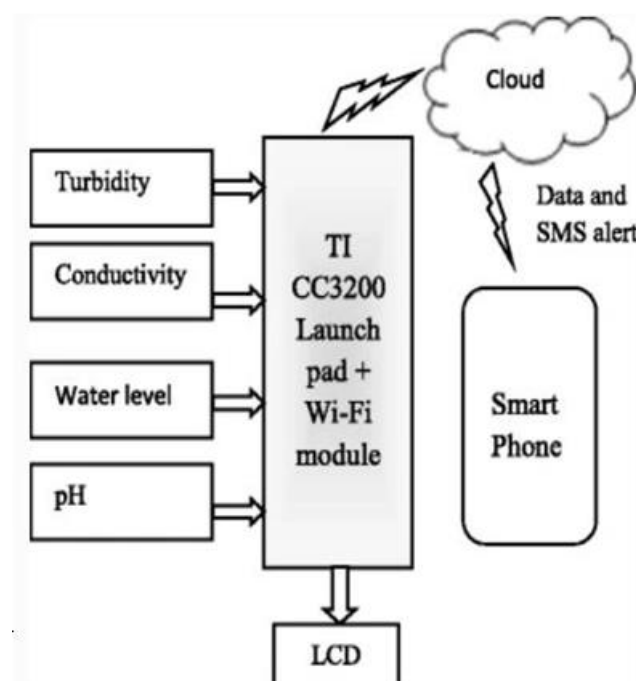


METHODOLOGY

The development of simple prototype system fit for water quality monitoring to be comprised with the distinct components.

- The primary step would be calibrating and rounding off various decimal units with the respect to the specific values determining the salinity, turbidity and temperature of the water body.
- The system used is an Arduino micro controller with four accommodating sensors, RELAND SUN pH sensor with a temperature range of -10 C to 50 C. It has a response time of under 5s but a selling time to stabilize with the environment. DS18B20 Temperature sensor that has operating range that has operating range from - 55 C to +125 C with an accuracy of +/- 0.5 C.
- The Turbidity and pH sensors require calibration to convert the obtained voltage readings to the corresponding turbidity and pH readings. To calibrate, to different concentration of soils and water mixtures and different pH solutions were used to calibrate the turbidity and pH sensors, respectively.

All the integrated sensors were integrated via capillary tube and mounted on a Water Buoy.



Block Diagram of interdependency principles used in the Condition monitoring Buoy

WORK PLAN

The Timeline of the project is dividing according to the component and work attributes.

- Primarily task was to finalize the plan of action with definite research papers and component selections. Important tasks here were understanding the work flow and design consideration required to carry out the project.
- Then working on the Design and Analysis of the Sea Buoy under distinct static and dynamic analysis with various wave forms of air and water medium to create a mesh for fundamental balance of the system with integrated sensors. The Turbidity and pH sensors require calibration to convert the obtained voltage readings to the corresponding turbidity and pH readings..

BUDGET

S. No.	Measured Parameter	Proposed Sensor	Cost Per Sensor
1.	pH value of water	DFRobot Gravity Analog pH sensor	Rs. 3000
2.	Water Temperature	DS18B20 Temperature Sensor	Rs. 300
3.	Water Turbidity	DFRobot Gravity Analog Turbidity Sensor	Rs. 1000
4.	TDS level	SeeedStudio Grove TDS Sensor	Rs. 1400
5.	Arduino Mega 2560 Rev 3 ESP8266 and Miscellaneous	-	Rs.4000 Rs. 600 Rs.2500 Rs.5200
	Total :		Rs. 18,000/-

ANY OTHER DETAILS:

IMPACT OF OUR PROJECT TOWARDS SOCIETY:

- In the State of Tamil Nadu, supply of water most primarily comes from large reservoirs of water such as lakes, streams, seas and the ocean itself. As such, the condition monitoring system can be a good interface to monitor and work with the respect to the water culture and promoting growth to the fisheries department.
- Overall idea about the percentage of cultivated water for sediment washing, primary usage of salt water to freshwater ratio and Urban runoff, fish aquaculture and other eco-systems could be monitored and promoted.
- With the respect to the parameters various methodologies could be implemented in development and improvement of fish and water culture.

ADVANTAGES AND APPLICATIONS:

- One of the vital advantages of using our project would help in continuous monitoring and development of various interdependency eco-systems among water culture.
- Thorough idea about type and application of water with its constituents and fishes could be monitored and be used according to its work usage.
- Overall, the water condition monitoring buoy can be used in various applications for the development of the water work culture