

# ROBOTIC BOAT FOR COMMUNITY WATER QUALITY MEASUREMENT



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## ABSTRACT

Flooding and wastewater issues in natural water sources, exacerbated by the actions of water users such as neglect, encroachment for personal gain, and discharging untreated wastewater into rivers and canals, have been identified as significant concerns. To address these issues, the organizing team has envisioned leveraging scientific knowledge and technology alongside automated systems to develop a Community Water Quality Monitoring Robot. This robot can be remotely controlled using radio waves, allowing it to reach distant or difficult-to-access water sources. The system comprises hardware developed with an Arduino Uno R3 WiFi ESP8266 board and software programmed in C++ to accurately direct sensors and other components within the system. It measures various water quality indicators, including Total Dissolved Solids (TDS), acidity (pH), and Dissolved Oxygen (DO), with data collection facilitated through Google Sheets and analysis conducted via app.geckoboard.com. This setup is ideal for monitoring pollutant accumulations that could lead to water contamination. The process involves randomly testing water quality at five different school locations using the Water Quality Monitoring Robot. The collected data are compared with readings from a DO meter (Vernier DOV 2-001) and a Yierji Professional Water Quality Meter for pH and TDS values. The results demonstrated close correlations, with the robot detecting DO levels between 7.54 – 8.90 milligrams per liter, pH values between 5.08 – 5.76, and TDS readings between 202 – 246 ppm. In comparison, the Vernier DO meter and Yierji Professional meter recorded DO levels between 7.37 – 8.73 mg/L, pH values between 4.87 – 5.55, and TDS readings between 184 – 228 ppm, indicating consistent accuracy across all test points.

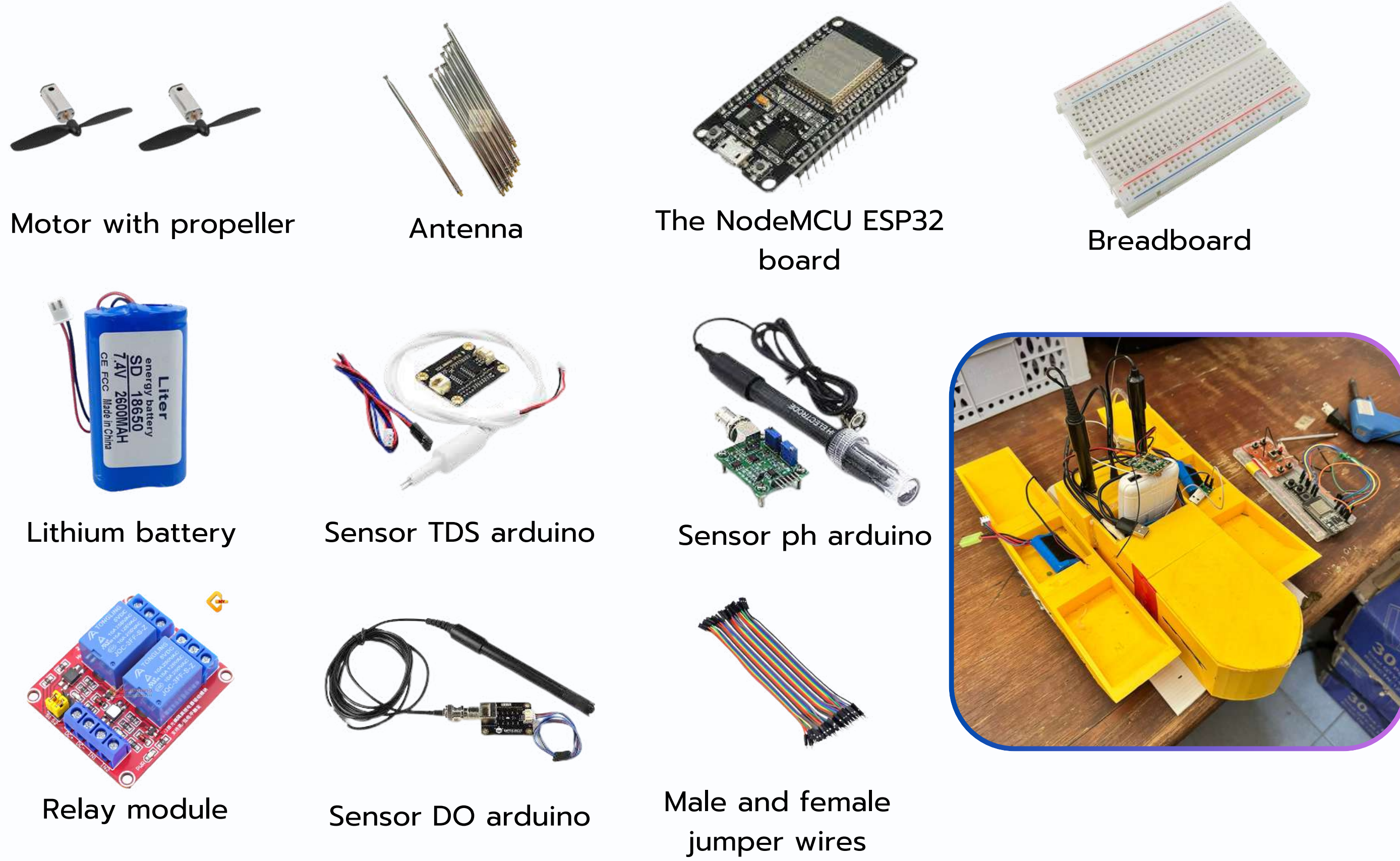
## ORIGIN AND IMPORTANCE OF PROJECT



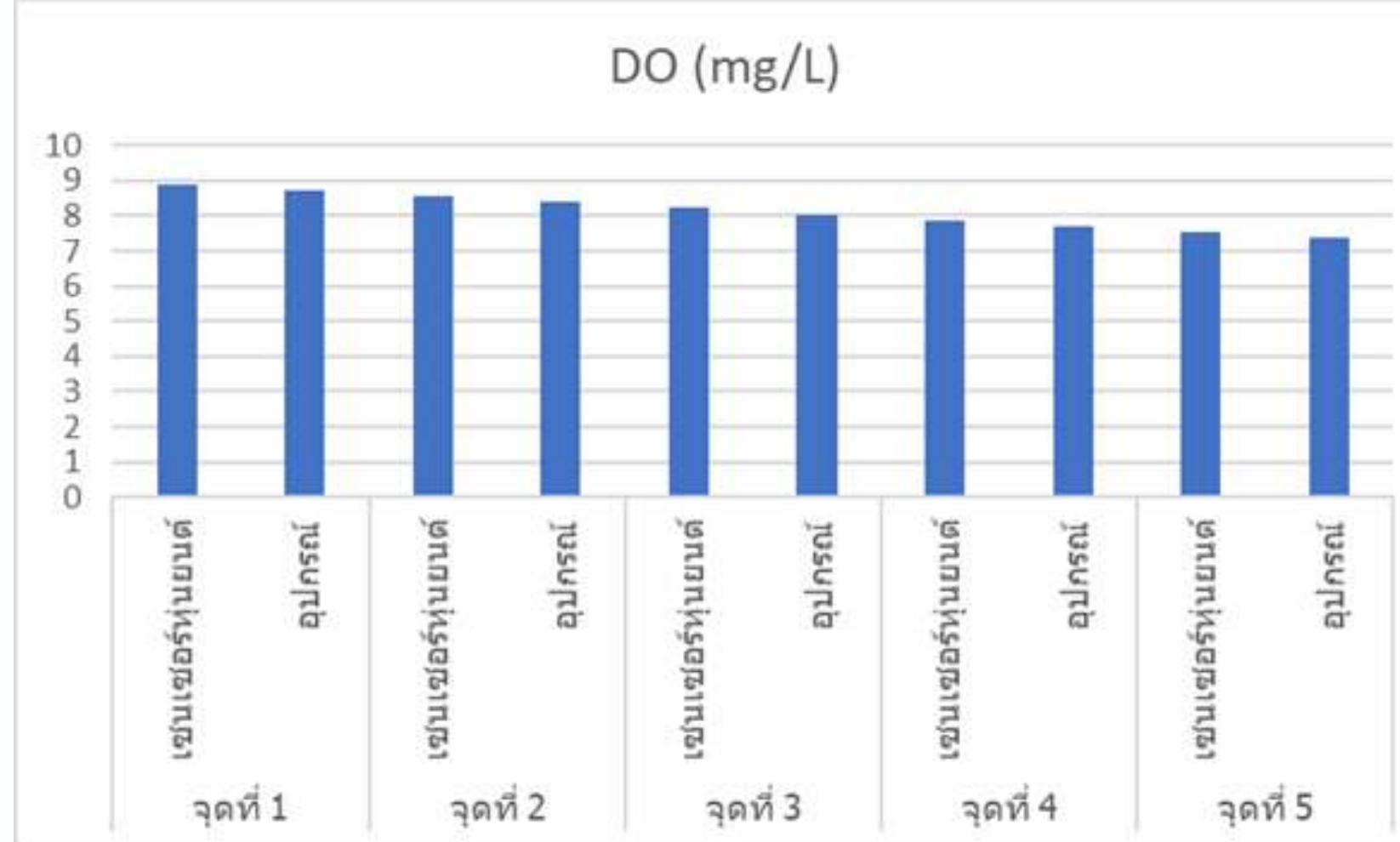
## GOAL OF THE PROJECT

- TO BUILD ROBOTIC BOAT FOR COMMUNITY WATER QUALITY MEASUREMENT, BE ABLE MEASURE WATER QUALITY
- TO MONITOR THE OCCURRENCE OF THE WASTEWATER

## STRUCTURE

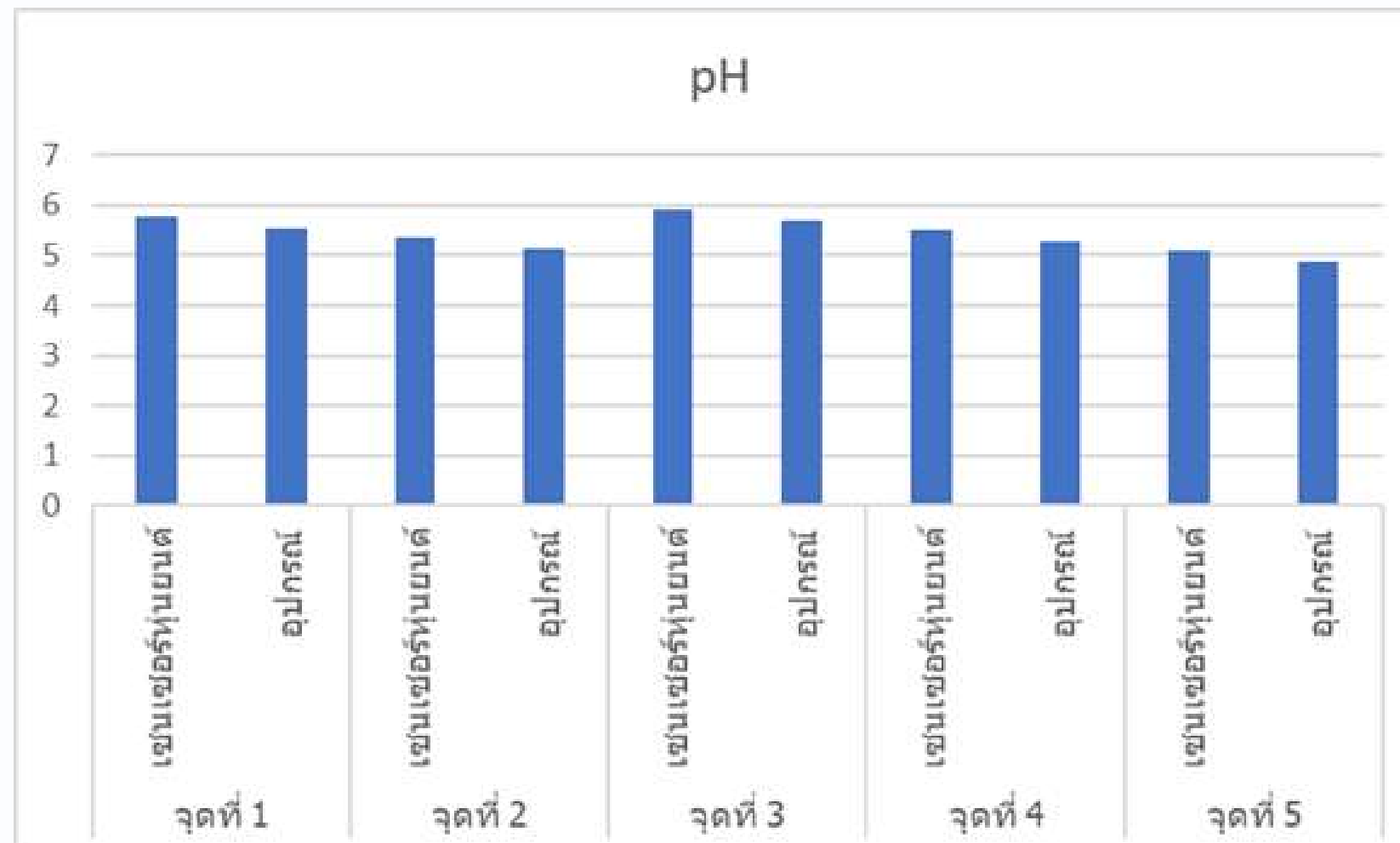


## RESULTS



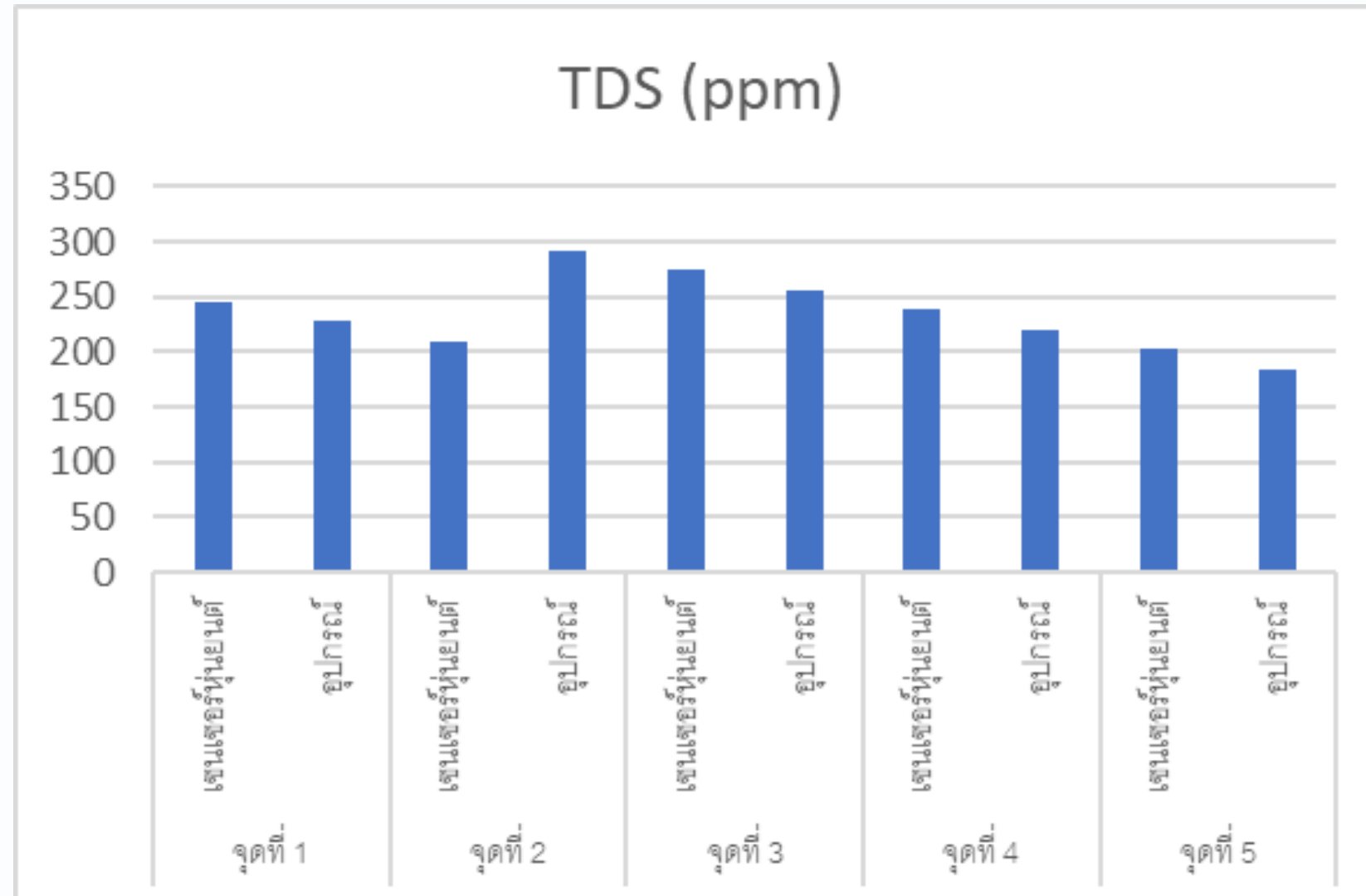
DO measured by our boat

DO is between 7.54 - 8.90 milligrams per liter



pH measured by our boat

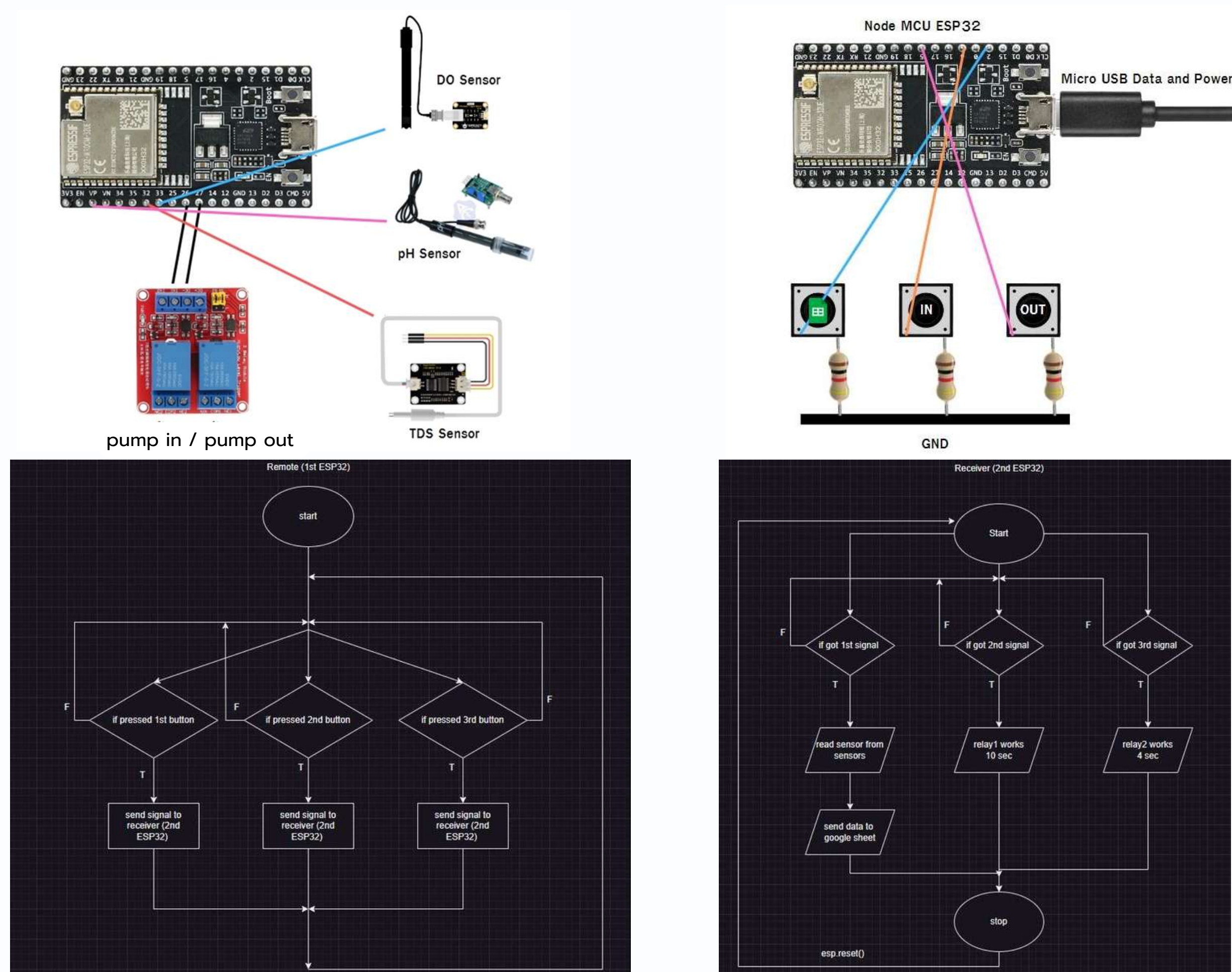
pH is between 5.08 - 5.76



TDS measured by our boat

TDS is between 202 - 246 ppm

## PRINCIPLE OF THE SYSTEM



## TESTING ROBOTIC BOAT FOR COMMUNITY WATER QUALITY MEASUREMENT



## DISCUSSION & CONCLUSION



- The Vernier DOV 2-001 DO meter and Yierji Professional digital water quality tester showed DO levels from 7.37 to 8.73 mg/L, pH from 4.87 to 5.55, and TDS from 184 to 228 ppm.
- The robot recorded DO levels from 7.54 to 8.90 mg/L, pH from 5.08 to 5.76, and TDS from 202 to 246 ppm.

which our boat got very similar and considerable accuracy compared with standard measuring device

## REFERENCE

All of info graphics and photos is designed and taken by authors.  
<https://www.greenpeace.org> <https://www.greenpeace.org> <https://www.cybertice.com> <https://thematter.co>