Report on ground water quality monitoring for City of Chennai

Conducted by
ICCW
&
1st year M.Sc. Chemistry Students (2021)
Stella Maris College, Chennai
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With the support and guidance of
Office of State ground water and surface water resources data centre,
Tharamani, Chennai

Submitted by
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ICCW-IITM with the support of the Office of the State surface water and ground water resources data centre, Government of Tamilnadu has piloted a ground water quality monitoring initiative for the City of Chennai recently. This on-going exercise is aimed to obtain real time data on groundwater quality across 100 designated locations across the City of Chennai prescribed by State Data Centre and Chennai Metro Water Board.

This involves (Figure 1) sample collection, testing using field test kits, recording the results on a mobile app from the GPS location, development of sensors for real time monitoring, transferring it to a cloud and perform data analytics.

The entire exercise of sample collection, testing, recording on app and transferring to cloud has been conducted with the help of post graduate students of Department of Chemistry of Stella Maris College, Chennai (figure 2 to figure 13). While the mobile app, hosting on the cloud and data analytics has been developed by Scientists at ICCW indigenously. The testing was performed using field test kits supplied by Orlab Instruments P Ltd., Hyderabad. These kits were used to test for analysis of 13 parameters namely, pH, Turbidity, Total hardness, Calcium, Magnesium, Chloride, Nitrate, Nitrite, Total Alkalinity, Sulfate, Fluoride, Iron and E Coli. In addition to this the laboratory infrastructure of ICCW has been used for cross verification of quality from field test kits and estimation of heavy metals and pesticides. This exercise would not have been possible without the support of the State Data Centre on surface and ground water, Government of
Tamilnadu. Field observers along with transport from this office were deployed with ICCW and students of Stella Maris College for collection of samples as per standard procedures.
Figure 5 A mobile water quality testing laboratory designed by the State data Centre was demonstrated to the students and faculty of Stella Maris College.

Figure 6 Officials of the State ground water and surface water resources data centre guided and interacted with the students and faculty on the significance of ground water monitoring and sampling procedures on 12th February 2021.
Figure 7 Ground water sampling using existing standard established protocols.

Figure 8 Geo tagging of samples for quick identification of location with samples drawn

Figure 9 Use of field test kits for testing and reporting of 13 parameters of ground water quality
Figure 10 Reporting of quality parameters from the GPS location using mobile app developed by ICCW

Figure 11 Data management and analytics by cloud is being carried out at ICCW

Figure 12 A sample water analysis dashboard has been developed, as a part of the pilot project for the city of Chennai
Against this background ICCW has embarked on developing a real time monitoring system for analyzing the quality of ground water and make large data on a time series chart. The data generated using field test kits and mobile app would be transformed into a real time big data generation exercise using real time sensors to be developed at ICCW.

1) The App can be installed with the following link. It directs to playstore in Android devices.

https://play.google.com/store/apps/details?id=appinventor.ai_k_kamalesh_c_chaudhari.ICCW_WQM_No_PWD

2) Please use following password while registering mobile number. Password is mainly to avoid stray users and random data entries, so share only with the participants of the project.

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Once registered, you can enter only mobile number and enter the data entry screen.

3) GPS detection takes a min or two so wait before refresh to get current address.