ABSTRACT

Citarum river water quality in West Java is still experiencing serious problems because it does not meet water quality standards throughout the year, especially during the dry season. The main cause of river pollution is the high amount of pollutant originating from various human activities, including agriculture, livestock, fisheries, industry and domestic activities. In addition, the river is also a place for household waste disposal, which increases the risk of inputs of contaminants that have a negative impact on water quality. Deficiencies in the water quality monitoring system have resulted in several standard Indonesian parameters, such as turbidity, odor, pH, dissolved solids, and temperature, not being included in the existing monitoring.

To solve water quality problems in the Citarum river, this research presents technology-based solutions using the KNN and Internet of Things methods. The process of monitoring water quality is carried out by installing sensors at several strategic points along the Citarum river flow. These sensors read parameters such as turbidity, pH, dissolved solids, and water temperature, and the collected data is used as input in the learning process of the kNN model.

The results of the KNN learning model show an accuracy of 85%, with the number of nearest neighbors at k = 9 using 300 datasets. Test results at several points of the Citarum river in several trials showed variations in the Citarum river water flow quality index. From the two points installed between upstream and downstream, there were two different results, including the results for the upstream showing that the quality of the water in the area's river basin still met the IKA, while for the downstream areas that had been occupied by residents around the watershed, the results were lightly polluted. Both of these data can be viewed in real time by using the Internet of Thinking which is on hardware at a predetermined point. In addition, the accuracy of the readings of the four sensors shows 90.75%. So, this research makes an important contribution in accurately monitoring water quality, which can be the basis for policy making in an effort to maintain and improve water quality in the Citarum river.

Keywords: River water quality monitoring, k-Nearest Neighbour (kNN), Internet of Things (IoT), Watershed, Citarum