LITERATURE REVIEW

S. No	Title	Author	Year	Inference
1	Comparative analysis of surface water quality prediction performance and identification of key water parameters using different machine learning models based on big data	K. Chen E. Al	2020	The water quality prediction performance of machine learning models may be not only dependent on the models, but also dependent on the parameters in data set chosen for training the learning models. Moreover, the key water parameters should also be identified by the learning models, in order to further reduce prediction costs and improve prediction efficiency.
2	Water quality prediction using machine learning methods	A. Parsaie, A.H. Nasrolahi, A.H. Haghiabi	2018	This study investigates the performance of artificial intelligence techniques including artificial neural network (ANN), group method of data handling

				(GMDH) and support vector machine (SVM) for predicting water quality components of Tireh River located in the southwest of Iran. To develop the ANN and SVM, different types of transfer and kernel functions were tested, respectively. Reviewing the results of ANN and SVM indicated that both models have suitable performance for predicting water quality components. During the process of development of ANN and SVM, it was found that tansig and RBF as transfer and kernel functions have the best performance among the tested functions.
3	Support vector machine-an alternative to artificial neuron network for water quality forecasting in an agricultural nonpoint source polluted river?	M. Liu, J. Lu	2014	Water quality forecasting in agricultural drainage river basins is difficult because of the complicated nonpoint source (NPS) pollution transport

				processes and river self-purification processes involved in highly nonlinear problems. Artificial neural network (ANN) and support vector model (SVM) were developed to predict total nitrogen (TN) and total phosphorus (TP) concentrations for any location of the river polluted by agricultural NPS pollution in eastern China. River flow, water temperature, flow travel time, rainfall, dissolved oxygen, and upstream TN or TP concentrations were selected as initial inputs of the two models.
4	Prediction of water quality index in constructed wetlands using support vector machine	R. Mohammadpour, S. Shaharuddin, C.K. Chang, N.A. Zakaria, A. Ab Ghani, N.W. Chan	2015	Poor water quality is a serious problem in the world which threatens human health, ecosystems, and plant/animal life. Prediction of surface water quality is a main concern in water resource and

				environmental systems. In this research, the support vector machine and two methods of artificial neural networks (ANNs), namely feed forward back propagation (FFBP) and radial basis function (RBF), were used to predict the water quality index (WQI) in a free constructed wetland. A detailed comparison of the overall performance showed that prediction of the support vector machine (SVM) model with coefficient of correlation (R 2) = 0.9984 and mean absolute error (MAE) = 0.0052 was either better or comparable with neural networks. This research highlights that the SVM and FFBP can be successfully employed for the prediction of water quality in a free surface constructed

				wetland environment.
5	A survey on river water quality modelling using artificial intelligence models: 2000–2020	T.M. Tung, Z.M. Yaseen Tiyasha	2020	There has been an unsettling rise in the river contamination due to the climate change and anthropogenic activities. Last decades' research has immensely focussed on river basin water quality (WQ) prediction, risk assessment and pollutant classification techniques to design more potent management policies and advanced early warning system.Artificial intelligence (AI) models have shown remarkable success and superiority to handle such data owing to their higher accuracy to deal with non-linear data, robustness, reliability, cost-effectiveness, problem-solving capability, decision-making capability,

				efficiency and effectiveness. AI models are the perfect tools for river WQ monitoring, management, sustainability and policymaking. This research reports the state of the art of various AI models implemented for river WQ simulation over the past two decades (2000–2020). Correspondingly, over 200 research articles are reviewed from the Web of Science journals.
6	Predicting stream water quality under different urban development pattern scenarios with an interpretable machine learning approach	R.Z. Wang, J.H. Kim, M.H. Li	2021	Urban development pattern significantly impacts stream water quality by influencing pollutant generation, build-up, and wash-off processes. It is thus necessary to understand and predict stream water quality in accordance with different urban development patterns to

				effectively advise urban growth planning and policies. To do so, we collected pollutant concentration data on nitrate (NO_3^--N), total phosphate (TP), and Escherichia coli (E. coli) from 1047 sampling stations in the Texas Gulf Region. We utilized a Random Forest (RF) machine learning model to predict stream water quality under four planning scenarios with different urban densities and configurations. SHapley Additive exPlanations (SHAP) was used to prove the importance of urban development pattern in influencing stream water quality. SHAP results indicated that Largest Patch Index (LPI), Patch Cohesion Index (COHESION), Splitting Index (SPLIT), and Landscape

				Division Index (DIVISION) were the most important urban development pattern metrics affecting stream water quality.