Data fusion is the process of integration of multiple data and knowledge representing the same real-world object into a consistent, accurate, and useful representation.Dataanalysis is a process of inspecting, cleaning, transforming, and modelling data with the goal of discovering useful information, suggesting conclusions and supporting decision-making.

Though there may be a static limit on the release of industrial toxic effluents into the water bodies, there are some dynamically changing external factors such as climatic conditions which may contradict with the static limit fixed by the government by resulting in the increase of toxicity. In order to protect inhabitants from such threats, it is necessary to have a robust water quality monitoring system that can dynamically detect and send necessary data which may be used for analysis. During analysis, the level of chemical composition of water is compared with the threshold values of various instances. In order to support efficient decision making, various external sensor data such as temperature of the region where the water body is located and soil conditions are collected and fused with the analysed water data. However, developing such a system is complicated by several

requirements, in particular the need to operate in real-time. This task is further complicated

when monitoring sensors are prone to false positive and false negative readings.

To implement the former stated problem, we need real time sensor data for water, temperature and soil. For comparing the water sensor data with the threshold at the local fusion centre, we may make use of Maximum likelihood function, K-Means and Joint probabilistic data association. In order to overcome the false sensor alarms, multiple hypothesis test algorithm is more likely preferred.

To perform data fusion at the central node, the preprocessed water data is combined with the interdependent soil and temperature sensor data to arrive at an optimal decision making. The efficient algorithms that can be used for central data fusion are Bayesian Method, Dempter-Shafer Inference and Abductive Reasoning (NN or Fuzzy logic).

Central Fusion node

Alignment,

Association,

Estimation

Preprocessing ,

Association,

Estimation

Decentralized Architecture

Preprocessing ,

Association,

Estimation

Centralized Architecture

Preprocessing ,

Association,

Estimation