PROBLEM STATEMENT: AIR QUALITY MONITORING

ABSTRACT:

Air quality monitoring refers to continuous measurement of specific air pollutants also known as “criteria air pollutants”. Obtained air pollution data together with natural background/trace gas monitoring and stationary source emission monitoring helps to define what kind of air pollution people are exposed to. Air pollution monitoring data is essential for air pollution assessment, countermeasures and environment pollution policies by local and national authorities, private and public companies, and national organizations.

DESIGN THINKING:

1. NOx concentration:

Nitrogen oxides (NOx) are mainly nitrogen monoxide (NO) and nitrogen dioxide (NO2). Nitrogen oxides (NOx) cause photochemical smog and acid rain, and nitrogen dioxide (NO2) in particular has a negative effect on the human respiratory system, including the throat, organs, and lungs.

1. NH₃ Concentration

Ammonia (NH3) is a gas with a strong odor similar to urine, and each country has its own emission regulations because it is also a malodorous substance. It's commonly released from livestock waste, fertilizers, and vehicles. When it reacts with nitrogen oxides (NOx) and sulfur oxides (SOx) in the atmosphere, it can contribute to the formation of PM2.5, which is a type of harmful air pollutant.

1. SO₂ concentration

Sulfur dioxide (SO2) is created when burning fossil fuels that contain sulfur, such as oil and coal. This gas is known to trigger asthma and is also a contributor to acid rain.

1. H₂S concentration

Hydrogen sulfide (H2S) is a gas that has a distinct smell similar to that of rotten eggs. Each country has its own emission regulations because it is also a malodorous substance. When people come into contact with it, it can cause eye and respiratory irritation, headaches, and dizziness. This gas is also commonly found in geothermal and hot spring regions.

1. CO concentration

Carbon monoxide (CO) is mostly created when carbon compounds are not fully burned. When humans breathe it in, it attaches to their hemoglobin and stops it from carrying oxygen, causing various harmful effects. It is also believed to extend the lifespan of methane, which is a greenhouse gas.