A REVIEW ON INDUSTRY POLLUTION CONTROL AND MONITORING

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Abstract : In the end of 18th and 19th century we have seen the drastic revolution in the industry which help country in the overall growth but along with this the adverse effect of this is an increase of industrial pollution, during the early revolution the industries were small so the pollution but as the industries become the large production plants it lead to more pollution. Industrial pollution is one of the major factor affecting the public health which led to strict regulations formation against the industrial pollution. ensuring the control of pollution we also have to concentrate on the production of the industry as it is the major factor in the growth of the industry. In this paper we are studying different factors affecting the industrial pollution and also study how to monitor & control the different parameters. with the advancement of new technology there are lot of ways are there to deal with the industry pollution. we have shown some study of this in our work.

IndexTerms:- **Wireless sensor network, pollution, IoT, sensors.**

I. INTRODUCTION

Technology has advanced tremendously over the last two decades. Today, we have access to more products and services than ever before. However, the same technology that makes our lives easier contributes to pollution, affecting our health and the environment. Industrial plants, factories, ships, research labs and other businesses discard chemicals or emit harmful byproducts into the environment. Sulfur dioxides, nitrous oxides, carbon monoxide and volatile organic compounds are among the most common pollutants. These substances end up in the food we eat, the air we breathe and the water we drink.

Carbon dioxide emissions per person, for instance, are expected to be around 13.3 metric tons in the U.S. alone by 2050. In 2017, over 63 percent of Americans have expressed their concern about the pollution of drinking water. Approximately 47 percent are concerned about air pollution. Globally, more than 2 billion people don't have access to safe drinking water.

As a business owner, it's your responsibility to implement industrial pollution control practices within your organization. Simple things such as sorting the garbage into different bins and investing in equipment that helps reduce waste can make a difference. If you don't know where to start, check local and national environmental programs designed to help companies reduce emissions and minimize waste.

Government now a day's encourages prevention and control of pollution worldwide. some of the industries will require to take permit for pollution. some of the organizations who try to emit the pollution below some threshold level are encouraged by giving some emission reduction credits and other incentives. There are a couple of things every business can do to reduce its carbon footprint and protect the environment. If you own a small business, for example, you can purchase energy-efficient equipment for your organization and choose office supplies and other products made from recycled materials.

II. LITERATURE SURVEY

With the advancement of communication technology , network and remote sensing technology there has to be some way to go for air pollution monitoring through wireless technology. there are so many adverse effects are there because of air pollution like in breathing , coughing, respiratory system. In some of the industries like cement pollution monitoring is monitored with respect to emission through chimney only. instead of that we can go for wireless network technology for monitoring , swagarya et.al. [1] has worked on the same path giving brief idea about use of wireless sensor network in air pollution. in this work they have analyzed in earlier work people were monitoring pollution level through chimney only but they ignore pollution from the other part of the industry where close locations are there. and also in cement industry these system when applied they were expensive so swagarya has proposed to work wireless sensor network to reduce the cost also.

In some of the cases related to air pollution we monitor various gases such as carbon monoxide , carbon dioxide etc. traditional monitoring systems are expensive burla et.al.[2] has proposed the work for monitoring air pollution through wireless sensor network. they monitor the quality of air with respect to the standard put forth for that purpose nodes are spread throughout the area and values are taken from these areas and transmitted to nearest base station and control room. this system will evaluate and give analysis on health risk for that respective areas because of air pollution. because of the increased number of the vehicles air pollution is getting increased on the similar approach Siva Shankar Chandrasekaran et. al.[3] has worked to detect the level of Pollution and indicating it to the driver. similar to the air pollution there is a problem with water pollution because of the

increased industries , Prashant Salunke [4] has worked on the water pollution monitoring based on the concept of Internet of things.

Recently wireless sensor network has shown their presence more because of their use in various applications where mostly sensors are used. their advantage is that these sensors are small in size and they have enough computing strength along with that they not costly as compared to traditional resources. Divyata et.al.[5] has worked on automobile pollution , headlight intensity control based on wireless sensor network. with the help of wireless sensor network they will automate the existing pollution control system.

Sensor networks are consist of small, low-cost sensors, which collect and distribute environmental data among each other. With the help of wireless sensor network we can do control and monitoring of different networks [6]. They have applications in a variety of fields such as indoor climate control, environmental monitoring, , structural monitoring, medical diagnostics, surveillance ,disaster management, emergency response, ambient air monitoring and gathering sensing information D.culler et.al [7]. in last few years economic growth of Mauritius is based on the industrialization and tourism development, because of urbanization and increased in vehicles air pollution has been increased in last decades in Mauritius. Kavi K. Khedo et.al [8] proposed a wireless sensor network air pollution monitoring system (WAPMS) for Mauritius.

Studies have demonstrated that the pollution concentrations recorded by fixed monitors may not reflect the values of the surrounding areas and therefore are inadequate for assessing population exposure. Julie Wallace et.al.[9] has done work on mobile monitoring. Internet if things (IOT) considered as a technology in the evolution in the global information industry after the Internet. IOT is helpful in connecting different things to the internet for information sharing and exchanging . Shanzhi Chen et.al.[10] has given as insight with respect to the utilization of IoT in the various applications and the challenges occurred.

Yi-Bing Lin et.al. [11] has proposed the work were they are specifying the range of values which can be pass on to the remotely with the help of IoT. sensor network plays important role in this which will capture the data with the help of different sensors. they have mainly focus on how IoT devices communicate with each other. human being and animals were affected by lung cancer, irritation of eye, breathing problems because of elimination of gases , but for these kind of problems government has to take certain actions and against industry and industry also has to fulfill some of the standers regarding pollution put forth by the government . One of the major issue was Air pollution and sound pollution by finding it and detecting is the main objective. To overcome this problems gayatri k.[12] has worked on the monitoring of environmental disaster around the manufacturing industry.

In most of the industries now a days they are using pollution monitoring system , they are useful for monitoring the parameters responsible for the pollution. the basic idea is to reduce the pollution by applying certain corrective measures without affecting the industry environment. R.Venkatasreehari [13] proposed technique is to design an efficient system to read and monitor pollution parameters and if any of these factors exceeds the industry standards immediately these information send to pollution control authority. On the similar concepts A.Srinivasan [14] has worked on the remote monitoring of hazardous gas monitoring. wireless sensor network is also used in the a brief overview of solid-state gas sensors, which can be classified into semiconductor, capacitor, and solid-electrolyte type sensors, based on their sensing mechanisms[15]

Industrial quality monitoring is the gathering of data with different industries and at regular intervals in order to provide the data which may be used to define current conditions. Due to the complexity of factors determining industrial quality, large differences are found between various industries. Similarly, the response to industrial impacts is also highly variable. Pravin J. et. al. [16] has described the work based on pollution monitoring based on GSM and LabVIEW.

III. METHODOLOGY

Pollution free air is one of the major need of human being but because of the urbanization and industry revolutions the problem of pollution is becoming more worse issue . Therefore there is a need to have monitoring and control on the pollution. pollution is in the different forms like air, water, various gases which directly affect the human being. like CO2 , sulphur dioxide(SO2) etc. , along with this smoke automobile exhaust, chemical discharge from industries, radioactive substance. there are various sensors are available for capturing the data like temperature sensor, Ph Sensor which capture the real time data. with respect to the innovation in the data access it is very easy now to access the data remotely in literature review we have given brief insight on this. overall methodology for the   general working of pollution monitoring and control is shown in the Fig.1. It describe the overall working strategy for the pollution monitoring and control In this case first we have to decide which kind of sensors we have to use for capturing the respective data based on that data has to be captured and processed . if the data is not captured properly then we have to repeat the process . There are various processes are there to display the data with the help of digital screen or on the webpage. If we are using LabView then on the front panel also we can project the data. in industry accordingly we monitor this data and accordingly take corrective action against different pollution problems.
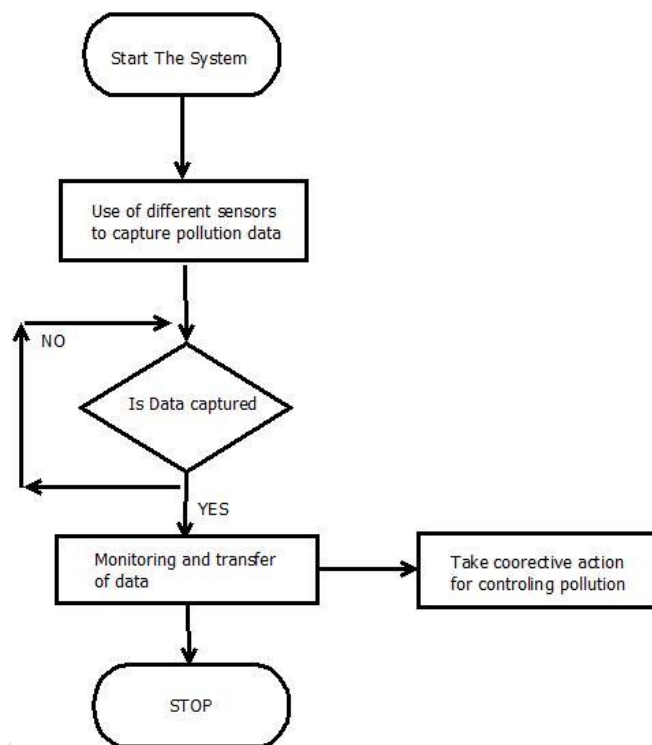
Fig. 1. Block diagram for working of pollution control and monitoring.

IV. CONCLUSION

With the literature survey it has been found that problem of pollution is serious issue and it is affecting the human being health. there are various strategies are being given by different authors based on technology evolution. major changes has been found in the pollution monitoring based on evolution in the wireless sensor network and its applications. with the help of sensor network and the devices supporting them it would be easy to exchange the data between them. along with that the study has been done with respect to remote data access. This system can further be improved by use of different sensors to capture the data and use of recent technology like IoT by which we can remotely monitor and access the data easily.

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