MONITORING OF AIR QUALITY AT CONSTRUCTION SITE EQUIPPED WITH RMC LUCKNOW: A REVIEW

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ABSTRACT-

The human behavior over the last few decades has changed the global atmospheric condition. The emission from automobiles, industrial emission, urban development, intensification of agricultural practices has escalate the levels of the harmful gases like CO2, CO, SO2, NO and Particulate Matter(PM) coming from RMC plant which probably changing the condition of the atmosphere and in turn harming us.

The study aims at assessing the rate of air pollution in Lucknow with the focus on the Particulate Matter 10, Particulate Matter 2.5, Sulphur Dioxide and Nitrogen Dioxide. The study also reveals the major cause of the air pollution in Lucknow, the areas of Lucknow which are severely under pollution threats and monitoring the tracking mechanisms which has been set up; lacking equipments and the reason behind the same and little focus on the implemented awareness method among Lucknow is on air pollution.

The study accounts the data of the recent months and the comparison to evaluate the increasing amount of level of pollution from last years.

The Maharashtra Pollution Control Board (MPCB) has sought steps to monitor four major air polluters in the city — dumping grounds, Ready Mix Concrete (RMC) plants, industries and vehicles. In January, the Air Quality Index (AQI) in the city had worsened to levels found in Delhi after the fire at the Deonar dumping ground .

INTRODUCTION-

Lucknow city is the capital of Uttar Pradesh which has a population of **2.82millions** as per 2011 census. The Pollution means the contamination of the air. As per section 2(a) of Air(Prevention and Control of Pollution) Act,1981 air pollution has been defined as, " any harmful substance present in atmosphere in such concentration as may be or tend to be harmful to human being or other living creatures or plants or property of environment". In our study the unwanted substance like Particulate Matter 10, Particulate Matter 2.5 and Sulphur Dioxide, Nitrogen Dioxide and carbon dioxide coming from RMC plant and vehicle use on it.

As we know that Ready Mix Concrete (RMC) industry is continuously growing all over the world and India is not an exception to it. Like other industries, RMC industry is also exposed to multidimensional risks from all directions. These risks must be addressed properly so that RMC industry shall gain credibility, confidence of the customers and shall have expected profit margins.

An RMC plant is a factory or batching plant where cement mix is made in large quantities. From here, the mix is delivered to construction sites in trucks with mixers that keep rotating to prevent it from getting dry. So that movement of vehicle and machine of RMC plant will emitting the harmful gases and particulate matter because of the movement of vehicle.

I was studying an article in which in 2010-11 the main sources of air pollution in Mumbai found that construction activities alone were responsible for a whopping 8% of the city's pollution. Because in construction activity there is demolished the old building caused

Key Words – Risk, Multidimensional, RMC,Air quality, pollution, real time monitoring.

OBJECTIVE-

The objectives of the Monitoring of air pollution at construction site equipped with RMC are that to monitor the air pollution emitted from RMC plant.

1- To monitor air pollution at RMC plant at big project site.
2- To measure the particulate matter with the help of respirable dust sampler.
3- To find out best techniques to control air pollution at construction site.

SCOPE-

The scope of my study is Air Pollution monitoring and its control. And we know that Pollution monitoring and control is always an extensive area for research. There is always a requirement for modification of existing equipments and methodologies.

Sitting criteria of RMC plant –

The following sitting criteria shall be considered for establishment of RMC plant.

1- For commercial plant a buffer zone of approximate 100 mtr distance from human habitation of 1000 souls or more and major road ,shall be maintained.
2- For captive plant for specific project, the location of RMC can be inside the project premise.
3- RMC should not be located within 200m from sensitive places such as school, college hospital and court .

Environmental assessment of plant –

The following factor shall be taken into consideration for environmental assessment.

1- Material handling and storage capacity shall be specified.
2- To carry meteorological study specifically wind direction and accordingly prepare to control of fugitive emissions/ dust particle suppression system.

LITERATURE REVIEW-

The literature review was conducted through analysis of studies found through researches in several databases including Web of Science and Science Direct and in many journals, including Atmospheric Environment, Journal of Construction Engineering and Management, Environmental Health Perspectives and Journal of Hazardous Materials, among others.

Ghanim Kashwani1, Abeer Sajwani, Muhammad Al Ashram, Rahma Al Yaaqoubi 11 March 2014 In any project, attaining sustainability requires the integrity of four main elements. The release of particulate matter (PM) including PM10 and PM2.5 could be considered the main air pollutant that is emitted from this industrial sector; where PM can be released from different stages of ready-mix concrete production process. Another concern arising from the ready-mix concrete operations which may affect the soil and ground water quality is the spills or leaks that may occur from the storage containers used for diesel, motor oil, and chemical admixture. In 2010, Environmental Agency-Abu Dhabi (EAD) collected data pertaining to the operations of 73 ready-mix concrete facilities in the Emirate of Abu Dhabi. The data showed that the average production rate of concrete is around250000 m3/year, which indicates that the concrete industry is a very active industry in the Emirate. Hence, EAD has established a set of plans and requirements to minimize the environmental impacts of concrete production on the environment and public health. In this paper, a variety of BMPs are presented for ready-mix concrete manufacturing facilities in Abu Dhabi. These

BMPs cover the following areas: raw materials handling and transport, process operation, housekeeping, waste management, emergency response, and training record. EAD can then regulate the ready-mix concrete manufacturing sector in Abu Dhabi using these BMPs and the requirements of the issued permitting conditions in order to have a sustainable industrial sector.

Karr et al. (2007) assessed the effects of PM2.5, NO2, CO, O3 exposure on severe bronchiolitis on infants three weeks to one year. This study measured 18,595 hospital discharges in the South Coast Air Basin and matched each case to 10 controls (169,472) based on age and gestational age. Authors assigned monitoring stations by ZIP code, and controlled for weather (humidity and temperature), and sociodemographic factors. Authors measured exposure both by mean lifetime expo sure (mean of monthly averages) and by mean concentrations the month before admission (average of daily levels over the month). However, in single pollutant models, PM2.5 was the only pollutant significantly associated with bronchiolitis

Cuttack. **Pradeepta K. Bhuyan, Pradyusa Samantray and Swoyam P Rout** (2010) discussed the use of Air Quality Index (AQI) describing air pollution in Choudwar area. AQI is computed for ten air quality sampling stations in the Choudwar area within the radius 10 kms from the core zone. This study identifies the potential sources of air pollution. The data obtained from monitoring of ambient air at ten locations within the study area are used to calculate the AQI for each season during the study period. Throughout the study period SPM was found to be minimum of 102.2 mg/m3 at Narapada, monsoon, 2007 and maximum of 360 mg/m3 at Kapeleswar Near IMFA, Post-monsoon, 2007 and also at Ghantikhal, Premonsoon, 2008.

Bangalore.Kamath and Lokeshappa(2014) investigated air pollutant concentrations at Residential, Industrial & Sensitive Areas of Bangalore. SO2, NOX and RSPM were collected over six sites in Bangalore. The sampling stations are located at Victoria Hospital, Graphite Industrial Area, Amco Apartments, Peenya Industrial Area, Yeshwantapur Residential Area and K.H.B Industrial Area. Meteorological parameters like Temperature, Relative humidity, Wind speed, Wind direction & Rain fall data were also recorded during the sampling period. Monthly and seasonal variation of these pollutants have been analysed and noted. It has been observed that the concentrations of the pollutants are high in summer in comparison to the Pre-monsoon and post-monsoon seasons. In the present study, it was noticed that the RSPM levels at all selected sites exceeds the prescribed limits. Apart from this the SO2 and NO2 levels in industrial areas remain under prescribed limits. In this study, air quality data of different Areas of Bangalore were collected and also to assessed the air quality and finally following conclusions have been drawn. At all areas SO2 and NO2 concentration in the ambient air was found to be within the permissible limit except at Victoria Hospital for NO2. RSPM concentration exceeding 4.5 times than acceptable limit was observed in the ambient air at Yeshwanthpur during 2014 (RSPM - 274µg/m3).

Ahmedabad and Gandhinagar. **ChintanY. Pathak, Hiren C. Mandalia D. Roy and R. B. Jadeja** (2014) studied the comparative analysis of ambient air quality of Ahmedabad and Gandhinagar in Gujarat. Both thecities have been studied on the basis of land use pattern and meteorological condition. AhmedabadDuring monsoon (June 2012 to August 2012), the minimum concentration of pollutants were found due to increased vertical dispersion, washout by monsoon rains and suppressed wind erosion. During winter (November 2012 to February 2013) there was a maximum concentration range of all parameters. The minimum and maximum average concentration of SPM was recorded from 185 µg/m3 to 362 µg/m3 .Maximum concentrations were recorded during January. During winter season mixing height was very less with respect to the other seasons. High concentration of Pollutants were observed on October due to festival. Minimum concentration of particulates and gases pollutants were found during summer season (April 2012 to June 2012). Lesser concentration levels of pollutants were recorded due to maximum mixing height, high temperature, high wind erosion and moderate stability. As compared with NAAQS, annual average SO2 and NO2 concentrations were found well below the prescribed limits.

Bhopal.SadhanaChaurasia, PragyaDwivedi, Ravindra Singh and Anand Dev Gupta (2013) analysed ambient air quality of industrial, commercial and residential area of Bhopal (M.P.). The study was carried out in February and March, 2012. Sampling time was 24 hrs. The relative AQI was found in severe air pollution range. Maximum value of PM2.5 and PM10 was found 80.90 µg/m3 and 160.53 µg/m3 respectively at Hamidia road on March and minimum value was observed 62.90 µg/m3 and 108.20 µg/m3 respectively at Govind Pura on February. All values of PM2.5 and PM10 at all selected stations were obtained beyond the permissible limit i.e. 60 µg/m3 and 100 µg/m3 respectively on both studied months. SO2 and NOx values were found within limit (80 µg/m3) at all selected stations in study period. Air pollution index was also calculated for all the parameters of both months and value of PM2.5 was found in red zone at all stations which indicate unhealthy air quality for health concern.

Shillong. R. E. Lamare and S. S. Chaturvedi (2014) studied concentration of RSPM, NRSPM and TSPM Shillong, Meghalaya. Sampling was done in April, 2010. The concentration of RSPM, NRSPM and TSPM at Dhankheti Junction varies from 81.24 µg/m3 to 261.43 µg/m3 ; 73.17 µg/m3 to 265.54 µg/m3 and 212.49 µg/m3 to 467.94 µg/m3 , respectively. Overall RSPM and TSPM concentrations were found to exceed the permissible limit. Based on the results obtained, the concentrations of particulate

matter in the ambient air at Dhankheti Junction was mainly by vehicles. However, their concentrations at NEHU campus were found comparatively lower and are within the limit.

Chris Woodford 2014). Air Pollution renders air unfit for respiration by humans and animals. Air pollution problem has been aggravated by the tremendous increase in the number of mobile sources (motor vehicles) in urban areas. The latest available data on air quality have prompted WHO to call for greater awareness of health risks caused by air pollution, implementation of effective air pollution mitigation policies and close monitoring of the situation in cities worldwide. In April 2014, WHO issued new information after estimating that outdoor air pollution was responsible for the deaths of about 3.7 million people under the age of 60 in 2012 (TNI 2014).

Naveen Kishore and Surinder Deswal 16 January, 2017 Air pollution in India has increased rapidly due to population growth, increase in the numbers of vehicles, use of fuels , bad transportation systems , poor land use pattern, industrialization, and above all, ineffective environmental regulations. Sulphor Dioxide, Nitrogen Dioxide, Particulate Matter are some of the pollutants which are contributing to environmental pollution. Purpose of this paper is to review the literature relating to the analysis of ambient air quality of some Indian cities and compare the same with Indian National Ambient Air Quality Standards. Also discuss of the use of Air Quality Index (AQI), seasonal variation in concentration of air pollutants. Assessment of health impacts due to increase in the concentration of air pollutants in Indian cities.

Humaib Nasir, Kirti Goyal and Dolonchapa Prabhakar November 2016 Air pollution is one of the foremost and grave public health and environmental anxiety in most of evolving countries. The objective of this paper is to provide insight details about current situation of air quality across various cities present in India, along with countless origins and effects of air pollution. An attempt is made to make people aware about various types of gases and particulate matter present in air highlighting their effects on environment along with the various ways of overcoming this situation. The National Air Quality Index (NAQI) ensures comparison amongst various cities so that new measures can be formulated in order to decrease the quantity of particulate matter present in air. In this paper concentration of various pollutants along with various harmful gases for various cities of India are analyzed based on past NAQI data thereby highlighting those areas which are under extensive menace of pollution. It has been perceived from past few years that the rate at which Urban Air Pollution across India has grown is alarming due to severe unsafe web of particulate matter (PM) and harmful gases present in air that living organism's breath. Levels of particulate matter are extremely higher in all cities of India.

Snehal Sirsikar1, Priya Karemore2 1, January 2015 Air pollution monitoring is though old but very useful concept in day to day life. Air pollution monitoringstart from traditional way to the most sophisticated computer has been used to monitor the air quality, however thefresh air is necessary for all human being, for that various technology has been used and some of this technology isreally useful in order to provide a real time air quality data. Aim of this paper is to highlight some technology which isused for air pollution monitoring and how effective of these technologies are and identify the important research inthis important area. Environmental monitoring is a systematic approach for observing and studying the condition of environment. For the healthy human being require to breath in a clean air but due to increasing the transportation system fresh air get polluted.
Guy Hutton 2011 This paper estimates the global damage costs of air pollution over a 150-year time period, from 1900 to 2050, focusing exclusively on air pollution of anthropogenic origin. Outdoor air pollution in urban centers and indoor air pollution from burning of solid fuel indoors are included, with damage costs made separately for developed and developing country groupings. Outdoor air pollution impacts include damages to health, crops, buildings and visibility, while indoor air pollution impacts include damages to health and additional time required for household members to collect biomass. This study estimates the total damage costs of air pollution to be US$ 3.0 trillion in 2010, or 5.6% of Gross World Product (GWP). These losses are equivalent to US$ 430 for every person on the planet. Damage costs are divided almost equally between indoor and outdoor air pollution at the global level; while around two-thirds of the damages are to the populations of developing countries. Health related damages account for 85% of total damages. Global damage costs are on a downward trend: starting from around 23% of GWP in the year 1900, the damage costs are predicted to fall to below 3% of GWP by 2050.

Debosree Ghosh and Pratap Parida International Journal of Current Research, 30 November,2015 The capital city of India, New Delhi has been recognized as the most polluted city in the world. World Health Organization (WHO) has reported this as per their findings in 2014. Bandyopadhyay et al,2014. It is indeed an alarming issue for the health of our future generations in India. We are aware of the ill effects of environmental pollutants and toxicants on health status of human as well as other living organisms and the environment (Ghosh and Parida 2015)The most vulnerable to the toxic effects of the pollutants are children and old people. Some significant measures should be taken and some strict laws should be made to prevent environmental pollutions in the major cities of India.Deadly diseases like cancer and asthma etc. are increasing in Indian population. Pollution is indeedresponsible for such increasing incidences of diseases.

Rinki Jain Karnika Palwa TERI. 2015. Air Pollution and Health. Clean air is the foremost requirement to sustain healthy lives of humankind and those of the supporting ecosystems which in return affect the human wellbeing. Release of various gaseous emissions and particulate matter (PM) has been on the rise due to rampant industrialized growth Anthropogenic emissions of various kinds are being pumped into the atmosphere (called primary pollutants) and lead to the formation of new pollutants due to chemical reactions in the atmosphere (called secondary pollutants). These are building up the concern of ambient

air pollution (AAP) as a prominent global threat to human health in many ways. For instance, according to the Fifth Assessment Report of the IPCC 'nearly all the non-CO2 climate-altering pollutants are health damaging, either directly or by contributing to secondary pollutants in the atmosphere'.

Hanna Zell, David Quarcoo, Cristian Scutaru, Karin Vitzthum Journal of Occupational Medicine and Toxicology 2010 Due to constantly rising air pollution levels as well as an increasing awareness of the hazardousness of air pollutants, new laws and rules have recently been passed. Although there has been a large amount of research on this topic, bibliometric data is still to be collected. Thus this study provides a scientific approach to the material published on this subject so far. For the time span between 1955 and 2006, 26,253 items were listed and related to the topic of air pollution, published by 124 countries in 24 different languages. General citation activity has been constantly increasing since the beginning of the examined period. However, beginning with the year 1991, citation levels have been rising exponentially each year, reaching 39,220 citations in the year 2006.

SA Rizwan, Baridalyne Nongkynrih, Sanjeev Kumar Gupta IJCM.8 · January 2013 Air pollution is responsible for many health problems in the urban areas. Of late, the air pollution status in Delhi has undergone many changes in terms of the levels of pollutants and the control measures taken to reduce them. This paper provides an evidence-based insight into the status of air pollution in Delhi and its effects on health and control measures instituted. The urban air database released by the World Health Organization in September 2011 reported that Delhi has exceeded the maximum PM10 limit by almost 10-times at 198 µg/m3. Vehicular emissions and industrial activities were found to be associated with indoor as well as outdoor air pollution in Delhi. Studies on air pollution and mortality from Delhi found that all-natural-cause mortality and morbidity increased with increased air pollution. Delhi has taken several steps to reduce the level of air pollution in the city during the last 10 years. However, more still needs to be done to further reduce the levels of air pollution.

Eleftherios Giovanis 12 June 2017 ELSEVIER Traffic congestion is one of the foremost problems confronted by the urban and suburban tenants of today, which increases vehicle emissions and degrades air quality. Urban planners and policy makers have consequently been always investigating choices to alleviate traffic congestion and to enhance air quality. Teleworking is one option that has received significant consideration and has been studied in the recent past. The aim of the study is to explore the relationship between teleworking, air quality and traffic in Switzerland. The analysis relies on panel individual and household level data over the period 2002e2013. We examine five main air pollutants; the sulphur dioxide (SO2), the ground-level ozone (O3) the nitrogen dioxide (NO2), the carbon monoxide (CO) and the particulate matter less than 10 mm (PM10). Based on the fixed effects estimates, teleworking reduces traffic volume by 1.9 per cent. Furthermore, the reduction observed on air pollution is higher for NO2, CO and PM10 ranging between 3.3 and 3.7 per cent, followed by O3 at 2.3 per cent and SO2 at 2.1 per cent. According to instrumental variable (IV) approach and the two stage least squares (2SLS) method, the effect is higher ranging between 2.6 and 4.1 per cent. The respective reduction on traffic becomes 2.7 per cent. Overall, the main concluding remark of the study is that teleworking can be a promising tool for urban planning and development, focusing at the traffic volume reduction, and the air quality improvement. We further discuss additional policy implications of teleworking and its beneficial effects for the society. At 2017 Turkish National Committee for Air Pollution Research and Control. Production and hosting by in other locations, including their home, the clients' premises, while travelling or in other remote locations (Bailyn, 1988; Perin, 1991; Perlow,1997 Sullivan and Lewis, 2001; Madsen, 2006) .

Rasa Zalakeviciute, Yves Rybarczyk, Jesús Lopez-Villada, Maria Valeria Diaz Suareze 10 July 2017ELSEVIER Most of urban air quality studies focus on the megacities of North America, Europe and, recently, Asia. Meanwhile, the most polluted urban areas in the world are rapidly growing large, mid-size and small cities of Asia, Middle East, Africa and South America. This raises a question: why relatively smaller cities are more polluted than the megacities? This study presents the first comprehensive decade-long analysis of the effects of fuel and transport regulations on PM2.5 (particulate matter of aerodynamic diameter <2.5µm) pollution in Quito, a medium-size city of South America. The effectiveness of a number of regulations is quantified through the elaboration of a high accuracy (98%) regression model. The model estimated that the PM2.5 concentrations were reduced by 67.6 mg/m3 , combating the effect of city growth and intense motorization, reducing the annual PM2.5 concentrations to 17.4 mg/m3 . This study is recommended as a guideline for thousands of other cities worldwide looking for optimal urban particulate pollution management. © 2017 Turkish National Committee for Air Pollution Research and Control. Production and hosting by Elsevier.

Md. Aynul Bari* , Warren B. Kindzierski e 18 July 2017 ELSEVIER With concern in recent years about dust issues and fine particulate matter (PM2.5) levels approaching a new Canadian Ambient Air Quality Standards (CAAQS), an investigation of air quality characteristics and potential sources influencing PM2.5 concentrations was undertaken in the community of Hinton, Alberta. The study was conducted for the period November 2013 to February 2016 using hourly concentrations of criteria air pollutants. Comparatively higher concentrations of PM2.5 were observed in summer (mean: 12.5 mg/m3 , median: 8.0 mg/m3)

than in winter (mean: 7.5 mg/m3 , median: 6.0 mg/m3). The 3-year averages of annual average PM2.5 concentrations (8.1e8.9 mg/m3) were below the 2015 annual CAAQS value of 10 mg/m3 . Exceedances of a 1 h Alberta Ambient Air Quality objective (58 times > 80 mg/m3) and a 24 h CAAQS (16 times > 28 mg/m3) were observed at Hinton for the study period and occurred during summer months primarily due to occurrence of forest fire episodes. A multivariate model positive matrix factorization (PMF) revealed five sources. Background dust and secondary aerosol was identified as the largest source contributing 68% to PM2.5 mass. Other sources included traffic (13.4%), an O3-rich source (12.7%), industry (3.1%) and a mixed source (3.1%). These findings offer preliminary information about contributions of different sources to PM2.5 at Hinton; and this information can support policy makers in developing appropriate management initiatives for reducing dust and secondary particulate matter pollution.

Robert Nedbor-Gross, Barron H. Henderson, María Paula Perez-Pena, Jorge E. Pachon 18 July 2017ELSEVIER We characterize particulate matter within the megacity Bogot a, Colombia using the Community Multiscale Air Quality (CMAQ) model. This work builds on previous efforts to develop representative meteorological simulations and emission inventories. Emissions are dominated by re-suspended particulate matter (PM), which are highly dependent on land-surface characterization and meteorology. We update previous re-suspended PM emission inventories to account for improved meteorological simulations and then we predict daily PM. Incorporating the latest meteorology and land-surface characteristics the resuspended PM are on average reduced to 43% of their original estimate. The re-suspended PM reductions are caused by natural mitigation impacts on unpaved roads, which is extremely sensitive to relative humidity. With the updated emission inventory, the model predicts daily average PM10 of 59.4 (±1.0) mg/ m3 compared to the observed values 58.3 (±0.7) mg/m3 at monitoring stations. The model performs well compared to literature recommended performance statistics except at two stations with outlier mean fractional bias and error. The remaining 10 stations have an overall mean fractional bias of 9.7% (stations ranging from 23.6e44.5%) and overall mean fractional error of 39.1% (stations ranging from 31.9 to 48.4%). Sensitivity analysis shows that both outlier stations are insensitive to the adjustments to resuspended road dust and are likely missing proximate sources from outside of the domain, or unknown sources within the domain. Still, within the core of Bogota, the model is capturing the variability of mass concentration. Future work should improve the chemical speciation of particulate emissions to better characterize specific source/receptor relationships.

Hyun Hee Lee, Na Rae Choi, Hyung Bae Lim c, Seung Muk Yi, Yong Pyo Kim, Ji Yi Lee 29 July 2017 Seven particulate oxygenated-polycyclic aromatic hydrocarbons (oxy-PAHs) were analyzed in atmospheric particulate matter with an aerodynamic diameter of less than or equal to a nominal 10 mm (PM10) for the period between September 2006 and August 2007 in Seoul, South Korea. The major contributors of oxy-PAHs production were identified based on statistical analyses such as correlation coefficient relationship, principal component analysis (PCA), and simple reaction kinetics calculation. The results show that (1) the average concentrations of seven oxy-PAHs were 7.63 ± 4.32 ng/m3 , with distinctive seasonal variations, being higher in winter (8.70 ± 3.90 ng/m3) and lower in summer (1.47 ± 0.73 ng/m3), similar to PAHs; (2) there were mixed contributions of primary emissions (e.g., vehicular emissions, biomass burning, long-range transport) and atmospheric reactions to oxy-PAH production; and (3) primary emissions might affect more than atmospheric reactions to the oxy-PAHs levels.

Annalaura Carducci Gabriele Donzelli Lorenzo Cioni Giacomo Palomba Marco Verani Giulia Mascagni Giuseppe Anastasi Tiziana Grassi Umberto Gelatti April 2017 From November 2015 to January 2016, the routine air monitoring showed a peak of air pollution (in particular of PM10) that caused alarm in many Italian cities and was widely reported by mass media. After some weeks from this alarm, we tried to evaluate the citizen awareness and interest towards air pollution together with their positive behaviors, using different information sources. Our qualitative analysis highlighted that only a small portion of articles included information about positive behaviors and environmental awareness. Despite the high media coverage and the satisfactory self-perceived knowledge, the majority of respondents judged negatively the received information (as untrue and incomplete) and declared a limited adoption of pro-environmental behaviors. The parallel study of mass media information and people's attitudes and behaviors seem to indicate that the high media coverage was not followed by a very high motivation towards pro-environmental behaviors.

Anshu Gupta 19 February 2018. Air pollution has become an extremely serious problem. Air pollutants affect both plants and animals. Under polluted conditions, plants develop different physiological, morphological and anatomical changes. Pollutants cause damage to cuticular waxes by which then they enter the leaves through stomata. This further leads to injury to plants which can be either acute or chronic. Changes in stomata due to air pollutants which seem to be small can be of great consequence with respect to survival of the plant during stress. These effects can further lead to disturbing the water balance of leaf or whole plant. Respiration also gets affected because of the exposure of plants to air pollutants. The present paper deals with the effect of air pollutants on stomata as well as on respiration leading to affect gaseous exchange.

C.AugustineMay 2012Port Harcourt, Nigeria The enforcement of air quality standards for populated urban areas has led to increasing attention to assessment of air quality management areas, where violation of air quality standards occurs, and development of control strategies to eliminate such violation of air quality standards. The Port Harcourt (Lat 4.78oN, Long 7.01oE and Elevation 468m) urban area is very densely built and has heavy motorized traffic. The increase of emissions mainly from traffic and industry are responsible for the increase in atmospheric pollution levels during the last years. The following air pollutants: carbon monoxide, sulphur dioxide, nitrogen dioxide, hydrogen sulphide and ozone, were measured with the WolfSense Multiple Gas Analyzer. The observed levels of CO, a criteria pollutant, exceeded the set limits of 10 and 11.4 µg/m3 by

Department of Petroleum Resources (DPR) and Federal Ministry of environment (FMEnvr), respectively while SO2 exceeded the set limits of 0.1 µg/m3 by DPR. The highest levels of CO and SO2 emissions was observed at mile-1 market road.

Eloy R. Lozano , Walter W. Melvin Jr. & Seymour ochheiser 16 Mar. 2012 Pollution emissions from three representative types of jet engines were determined. Pollutants measured included nitrogen oxides, aldehydes, carbon monoxide, hydrocarbons, and odors. A method is presented for determining the magnitude of pollution emissions due to commercial vehicle engine operation by using basic emission factors. Sampling apparatus and analytical methods used to determine pollutants.

D. N. Harris , J. R. Huffman & J. H. Weiland New York City 16 Mar 2012 An analysis of the ambient air quality in New York City over the past several years has been made. The various sources of the contaminants are identified and evaluated as to their effects on ambient air quality. Meteorological data have been analyzed to develop insight into the influence of weather conditions upon ground level pollution concentrations. The results of these analyses are employed to indicate the approaches that will be most effective in improving air quality. I he objective of this study, conducted by Jackson & Moreland Division for the American Petroleum Institute, was to investigate the various factors which influence the ground level ambient concentration of sulfur dioxide and particulate matter in New York City. Except for unusual weather conditions, low stack space heating, and incinerator sources are the predominant contributors of sulfur oxide and particulate matter contamination to the ground level air in New York City. The high concentrations of ground level sulfur oxides and particulates, constituting an "event" occur predominantly during the heavy heating months of Dec, Jan., and Feb.

Emmet F. Spencer JR 16 Mar 2012 This paper was one of several presented at the Workshop on Air Pollution Control in Portland, Oregon, on May 6, 1968. The Workshop was sponsored by the Manufacturing Chemists Association and the Chemical Industry Council of the Pacific Northwest in cooperation with the Association of Oregon Industries, Association of Washington Industries, and the Environmental Committee of the Portland Chamber of Commerce. While many of the papers were of localized interest, this paper speaks to anyone designing air pollution control systems. I articulate matter includes both solids and liquids, such as dust, smoke, condensed fume, and mist. The chemical industry emits an infinite variety of particulate matter, so a general discussion of the design considerations for the control of particulates will be made. In all but the simplest cases, the control system and device must be specifically engineered for the particular process. Using the above design parameters, alternate control systems should be evaluated. A well-designed control system must meet code requirements; must be properly sized for the gas volume; fit in the available factory space; be reliable, durable and constructed of suitable materials; be compatible with the basic process, and may require instrumentation to insure smooth operation and long life.

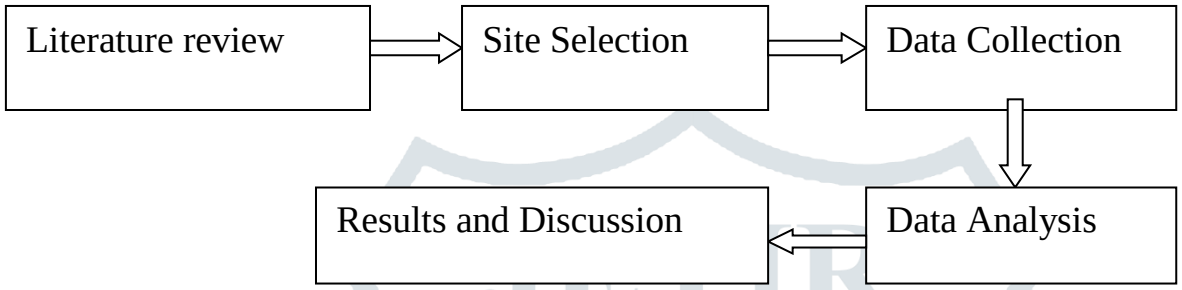
Lijuan Yang , Hanqiu Xu , Zhifan Jin 6 November 2018 Estimating exposure to $PM_{2.5}$ within urban areas has important implications for human health. Satellite remote sensing provides an effective means to retrieve spatial coverage of $PM_{2.5}$ concentrations. Using the monitoring network established by the local government in 2014, this study developed a linear mixed effects model that integrates aerosol optical depth (AOD) measurements (spatial resolution: 3 km) from MODIS and meteorological data from GEOS-FP meteorological fields as predictors to derive daily estimations of ground-level $PM_{2.5}$ concentrations in Fuzhou (SE China). A 10-fold cross validation method was employed to examine the performance of the mixed effects model. The cross validation yielded a R^2 value of 0.72, and a root mean square error value of 9.2 µg/m^3 for the mixed effects model. Furthermore, the monthly/seasonal average $PM_{2.5}$ estimated by the mixed effects model was highly correlated with those of in situ measurements. The results also revealed the spatial differences in the $PM_{2.5}$ distribution across the study area, i.e., higher concentrations in the urban center and lower values in suburban to rural areas. The results suggest that the mixed effects model using MODIS 3 km AOD together with meteorological data could be effective for the estimation of $PM_{2.5}$ concentrations in the Fuzhou area.

Suping Zhao , Ye Yu , Dahe Qin , Daiying Yin , Longxiang Dong , Jianjun He 10 September 2018 Regional $PM_{2.5}$ and ozone pollution and inter-city transportation in the city clusters of the Sichuan Basin (SB) were revealed using k-means clustering and the HYSPLIT backward trajectory model. The PSCF (potential source contribution function) and CWT (concentration-weighted trajectory) methods also were used to identify potential source regions of $PM_{2.5}$ and ozone in the basin. The regional $PM_{2.5}$ pollution was obvious with high levels at western and southern SB, while regional pollution characteristics of ozone were less significant than that of $PM_{2.5}$ inside the basin. Additionally, $PM_{2.5}$ was often transported directionally from one city to another city, while regional transportation of ozone was less significant than $PM_{2.5}$ inside the basin, which may be related to the fact that ozone reacted easily with primary emissions during transportation. The Tibetan Plateau (TP) also may be an important source region of high ozone in the city clusters of Sichuan Basin, especially west part of the basin. The results will provide advice to the government to take measures in improving air quality of SB.

Oanh Pham and Norimichi TakenakaJapan July 22, 2017 Moreover, PM2.5 carries many harmful compounds including polycyclic aromatic hydrocarbons (PAHs), byproduct from incomplete combustion of organic materials. For better knowledge about PM2.5-bound PAHs (p-PAHs) in Sakai City, Osaka, we measured PAHs in gas phase and particle phase (PM2.5) and apportion the sources as well as assess the lifetime lung cancer risk (LLCR). MethodologyµPM2.5 whose diameter is smaller than 2.5 & Theoretical Orientation: Using the low volume air sampler (LVAS) with flow rate of 4 L min-1, particles and gas phase of PAHs were collected on glass fiber filter (GFF) and polyurethane foam (PUF), respectively. Samples were collected on the

rooftop of 3-storey building in Osaka Prefecture University, Sakai City, Osaka, Japan. Diagnostic Ratios (DR) method for apportioning the PAH's sources. Backward trajectory was used for tracing source location. Findings: Main sources of PAHs were gasoline evaporation, vehicular emission and coal combustion. There was no significant correlation between PAHs and air pollutants (NOx, SO2, NMHC, etc.) at night time. The results showed that the gaseous PAHs were from local sources while the PM2.5-bound PAHs were from distant place. Backward trajectory results showed East Asia might be one of emission source's locations of PAHs in PM2.5 in Sakai City, Japan. The mean TEQ and MEQ in particle phase values were higher than annually averaged standard of 1 ng/m3 of EPA. Conclusion & Significance: Based on the TEQ values, Sakai City air were considered to be harmful to human health. Because atmospheric pollution is a global issue, there is a need for international policy about PM2.5 and harmful substances on it.

METHODOLOGY-



Conclusions-

From this paper, it have been able to clearly conclude that factors which affects the air and make our air polluted and these are particulate matter like $PM_{2.5}$ and PM_{10} and also some harm full gases like NOx, Sox etc. There are some limitations and gaps in earlier studies that thispaper attempted to cover. First, the majority of the studies used to calculate the limit of pollutant but in our study we collect the data and then we analyses and find the major problem who responsible for pollution and find out remedial measure to overcome the problem.

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