



Impact of air pollution in Urban Areas - A Case Study of Hyderabad

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ABSTRACT

The earth, since its inception has been developing to what it is today. Since the birth of the mankind there has been the development in technological, physiological and economical and in all other aspects too. In this process of the development the humans have altered the equilibrium maintained by the nature causing pollution on earth- Air, Water, Sound and soil pollution. In the current age the pollution of air is one of the largest life hazard faced by the life on earth. The recent research on “The Air Quality Index at Chicago University” have found that people loose on an average of 5 years of life due to the severity of the air pollution. After revelations, this paper puts an attempt to study the effects of air pollution in the area of Hyderabad city. The city of Hyderabad is chosen for the study due to its conditions of development, the size of the population which resides there, and the developmental activity which happens in the city has the direct impact on people’s quality of life due to the air pollution being produced due to the developmental and economic activity happening in the city through the population explosion, IT boom, Industrial corridors, the growth of the manufacturing industries in and around the city, Real Estate, the development of travel and tourism industry etc., this impact study of air pollution on the city of Hyderabad helps us to identity the broad prospectus of problems of air pollution in urban centers which occur as part of urban development and help us control the air pollution.

KEYWORDS: Urban Centre, population explosion, Development, Air pollution, Air pollutants, PPM.

INTRODUCTION: Urban centres, are the centres where most of the activity is driven by organised sector, and more than 1/3rd of the income of the city is produced due to Non-Agriculture activities which comprises of various businesses, manufacturing activities, processing units, infotainment centers, mining and also include various modes of transports. Urban areas, have been the centre for growth in a country in all aspects since ages. As the economic activity has been increasing day by day, due to the increase in the size of the urban population and simultaneously there is increase of urban economic activity. It is known fact that the economic prosperity due to manufacturing, industrial and mining, travelling and many other



activities come with the cost of pollution. As urban centres are the happening centres of these activities they are more prone to the resultant pollution which occurs in the form of Air Pollution, Water Pollution, Sound Pollution and Soil Pollution.

Of all types of pollution in this paper we are going to discuss about impact of air pollution in Urban areas, with an exemplary case study of Hyderabad. In this paper Hyderabad city has been chosen as study area as it has experienced all the above said events, which has expanded its limits and has keeping expanding them due to the population explosion, technological developments, increase in transport facilities etc.,

AIR POLLUTION

To discuss the gaseous type of air pollution we can start with carbon monoxide due to incomplete burning of fossil fuels. The major source of Carbon monoxide is automobiles, it is also produced from oil refineries, metallurgical operations and many other different types of combustions. After carbon dioxide Sulphur dioxide is the second most gas which is responsible for air pollution. When the natural composition of the atmosphere has the carbon dioxide that helps plants to prepare their food its increase can have cascading effect on life on earth due to shrinking forest covers. The CFCs that is the components of chlorine, fluorine, and carbon which are released into the atmosphere by several kinds of industries including refrigeration are also the cause of environmental pollution which is leading to Industrial area depletion (F.Sherwood Rowland et al, 2017). These chemicals are largely used in sprays, can dispensers in air conditioners, refrigerators and as blowing agents in insulation forms popularly known as Styrofoam. Their presence can also be seen in many other personal care products such as shaving creams, deodorants hair sprays and many other cosmetic products. When Sulphur dioxide gas reacts with autonomous ferric Oxygen and watervapour it produces sulfuric acid they can also result in acid rain which can be a very dangerous hazard causing irritable damage to agriculture forest aquatic life and humans. Oxides of nitrogen such as nitric oxide nitrogen oxide and nitrogen dioxide are form of air pollutants with nitrogen components. The source of origin for nitrogen oxides physically are thermal power stations, automobiles, aircrafts and factories, burning of petroleum and coal. There is also a concern for thermal air pollution due to unnatural differential temperature in different parts of the air. The heat released from the industries disturb the natural heat balance. The particulate matter like smoke forms as the source of air pollution. Many solid particulate matters released from urban agricultural and industrial sectors into the atmosphere which can be metallic or non metallic causes air pollution. Metallic dust particles come from the mining industrial and metallurgic operations.

STUDY AREA

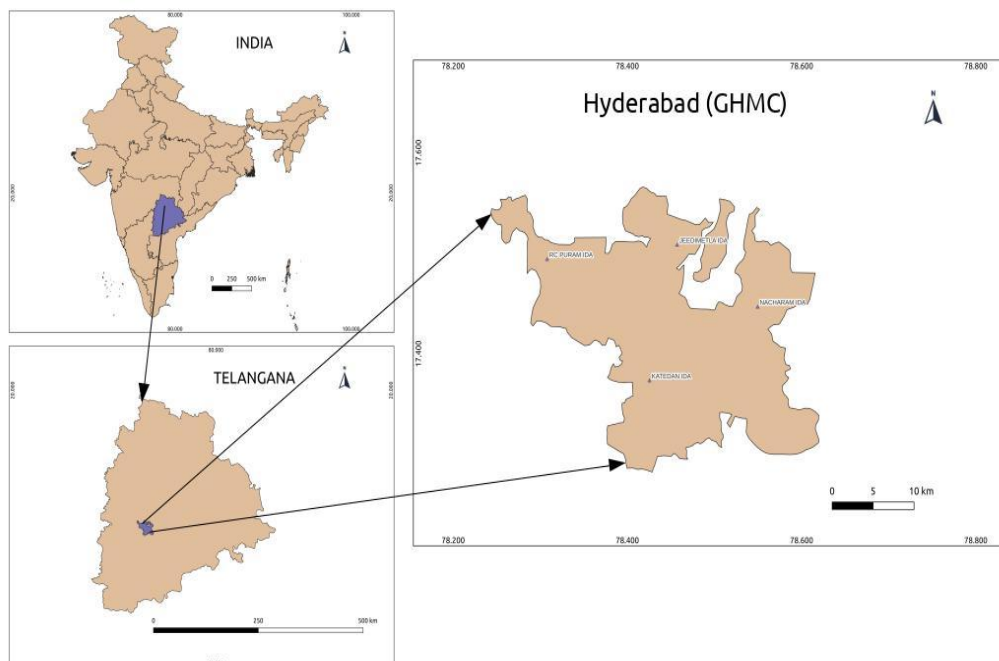
Hyderabad metro city has been chosen as the study area, as it is the 6th most populous city. Among the big cities in India Hyderabad was ranked as the fourth most polluted city after 1.Delhi, 2.Kolkata and 3.Mumbai and as the most polluted mega city in the southern part of the country.

Telangana was formed state in June 2014 with Hyderabad as its capital. The state was formed from erstwhile state of Andhra Pradesh. As per census of India 2011, Telangana State ranks 12th and covers 2.89% of the population of the country. About 39% of the population in Telangana

lives in Urban areas as per the census of 2011 compared to 31% at all India level. Hyderabad is a metropolitan city which has experienced the various stages of development since its birth. The city spreads into the neighbouring districts - Medchal, Malkajgiri and Rangareddy districts. Nearly 39% of the total urban population in Telangana state resides in the city of Hyderabad alone. Hyderabad has a GDP of US\$74 billion making it the fifth-largest city economy in India. The industries like Tourism, pharmaceuticals, real estate, the automobile industry, food processing, and electronics are fuel for its economy. A fleet of 3800 buses serves an estimated 3.3 million passengers departs from the Mahatma Gandhi Bus Station in the city's heart. Hyderabad Metro (a light 96 rail rapid transit system) was inaugurated in November 2017 and is the country's second-largest metro rail network, after New Delhi Metro. MMTS is a three-line suburban rail system in Hyderabad that transports 180,000 people per day. The present study analyses the impact of air pollution in Hyderabad city.

Initially, the industries were located in the out skirts of the city. But, as the population has increased the city limits have been expanded due to which the existing industries have come under the limits of the city. People who are working in those industries, people residing in the surrounding areas will be impacted by continuous exposure to the pollution caused by the industries. The government has recognized 28 such industries which are major source of Air Pollution, among which 4 industrial areas in Hyderabad are taken into consideration for study. They are – Katedan Industrial area, Jeedimetla Industrial Area, Nacharam Industrial Area and Ramachandrapuram Industrial Area.

Figure1 :Location Map





DRIVING FORCES OF AIR POLLUTION

1.Population Growth 2.Urbanisation 3.Industrialisation 4.Poverty

These 4 factors are interrelated with each others. Driving forces are responsible for the conditions which are threat to environmental health factors and to cause Air Pollution. Population growth, Industrialization, Urbanisation, Technology and development are considered as driving forces for Air Pollution.

1.POPULATION:

The first reason to be discussed relates to population, when the population increases, human activities are also increase, this puts more pressure on natural resources and produces more waste impacting on environment and leading to environment damage and resource depletion which has both direct and indirect effect on Health. Therefore more the population, more the impact on Environment Health creating Air Pollution.

2.URBANISATION:

Urbanisation is the second reason which is closely linked to population growth. There is an underlying close relationship between population growth and urbanization. According to the 2011 census, the population in India is 1.210billion, with 377.10 million people living in cities, which accounts to 31.14 percent of the overallpopulation. While speaking about the Telangana State, about 39% of the population in Telangana is living in Urban areas as per the census of 2011 compared to 31% at Pan-India level. An Urbanisation case study In India and metropolitan cities, studies have been conducted which show that the current sources of deterioration of Air Quality are also caused by urbanisation.

3.INDUSTRIALISATION:

Industrialisation is another factor closely related with Population growth. Because when the population increases it causes urbanisation leading to Industrialisation and vice versa. In terms of industrial pollution, industrialization has resulted in deterioration of quality of air causing Air pollution, no industry functions pollution-free. Industries such as thermal power plants, coal mines, cement spawn, Iron steel, and Ferro alloys emit dust, smoke, fumes, and poisonous gas emissions are highly polluting. Petroleum and chemicals industries are located in clusters. These industries inflict irreversible harm to our environment exceeding the nature's carrying capacity. Hyderabad city is witnessing the same phenomena because industrialisation has started in 1956 year, which has increased since 1991 after introduction of economic reforms and IT boom, now Hyderabad is hosting several 'Global Software companies and the city is also known for pharmaceutical industries' and others.

4.POVERTY:

It is essential to realise the link between poverty and environmental challenges. While environmental issues cause the poor to suffer greatly, People's poverty too puts a strain on the environment. Environmental deterioration can make it difficult for individuals, particularly the impoverished, to live in safe and sanitary conditions. Because impoverished people rely more directly on the environment for their survival than the wealthy, they are disproportionately affected by deterioration of environmental health leading to health issues.

The flow chart below, shows and explains the links between all the causative factors of pollution, it says that, the Population Growth paves way for Urbanisation along with Technological Development, with different Consumption Patterns resulting in Economic Development,

Sectoral Developments like- Agriculture, Industry, Energy Construction, Health Care Etc. These produce Goods and Services Food, fuels manufacturing, Transportation, Housing, drinking water, sanitation etc., by utilizing Natural Resource Use land, Forests, Minerals, Atmosphere, Freshwater etc. This causes Land degradation, waste dumps, Air Pollution, Water pollution, Workplace hazards, climate change which impacts Health and welfare of current and future generations by meeting needs, altering the living environment, modifying risks and the changing options for the future.

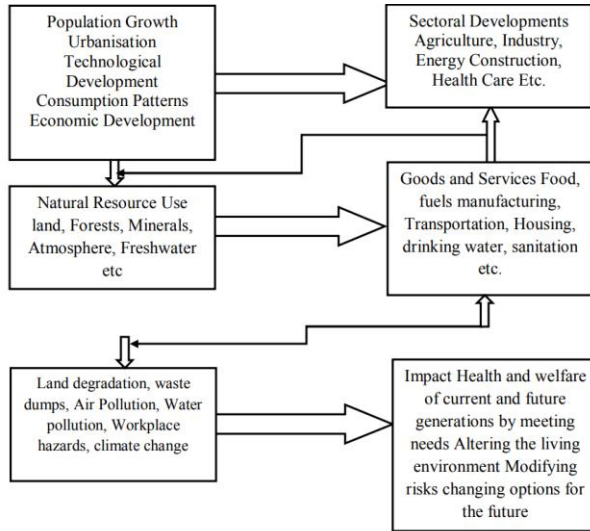
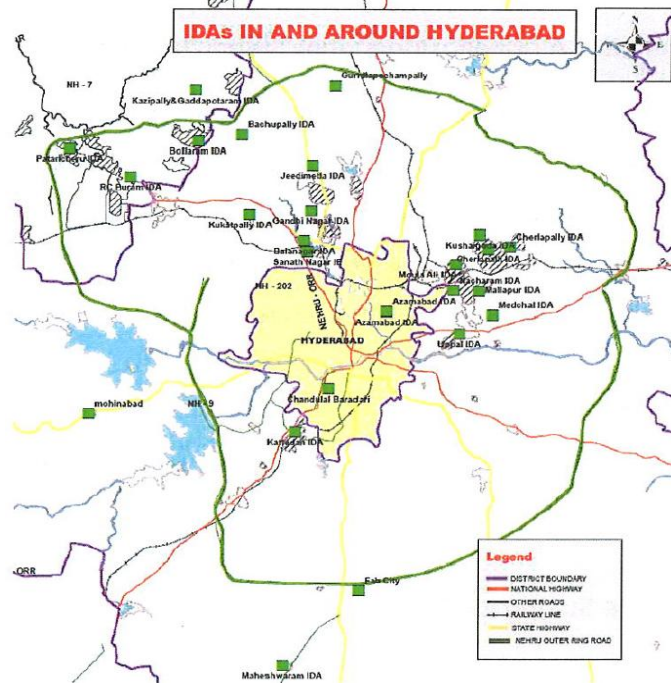


Figure 2: Industrial areas in and around Hyderabad



Source: Telangana State Pollution Control Board



OBJECTIVES

To study the impact of Air pollution on health of residents of selected Industrial areas .

DATABASE

In the current study area, the data is collected from 2 major sources, the primary as well as secondary data. The secondary data is verified with primary data field collected in real time from the study area i.e., selected four Industrial areas of Hyderabad. The primary data is collected from House Hold survey through questionnaire. Demographic and Socioeconomic data is obtained from the published records, Directorate of Economics and Statistics. Conducted Household Survey through Questionnaire over a period of one month i.e October, 2021 to get the data related to environmental air pollution to understand the health problems of study area.

METHODOLOGY

First randomly selected the Industrial areas of Hyderabad. Which are also identified as polluted regions of the city (Published by TSPCB action plan for non attainment of cities in Hyderabad).

1) Selected Industrial areas are as follows 1. Jeedimetla 2. Nacharam 3. Katedan

4. Ramachandarpuram, covering nearly four directions of GHMC (Greater Hyderabad Municipal Corporation).

2) Prepared a Questionnaire which has two sections

a) Socio Economic profile of Study area

b) Environmental health problem related questions

Conducted Household Survey through Questionnaire addressing the issues related to environmental pollution was prepared for House Hold levels and was circulated in four Industrial areas of Hyderabad. As per 2011 census there are nearly 38000 House Holds are there in these four Study locations but study is taken place in part of the study location i.e. industrial area of study location which is not having any administrative boundary. Thus, information of House Holds is given approximately i.e. there are total number of 10,000 House Holds are present. Number of House Holds information is given by elder man of respective colonies which are surrounded to respective industrial areas of Study area while collecting primary data and existing official/ leader in that area. On the whole sample size is approximately 2% i.e. 200 House Holds have been selected from Four Industrial areas and similarly 2% House Holds (nearly 50 House Holds) were selected from each Industrial area, where door to door survey was conducted by getting filled up the questionnaire set for the purpose.

The colonies which have been covered while collecting primary data as follows:

1) Katedan Industrial Area (IDA): Field work data is collected from the Colonies associated in this cluster are Hanuman Temple Road, SC Colony, Shiva Nagar Colony, LaxmiGuda, Durga Nagar. Industries included in this area are mainly 1) Food processing industries 2) Plastic scrap manufacturing industries 3) Iron industries.

2) Jeedimetla Industrial Area (IDA): Field work data is collected from the Colonies associated in this cluster are Shapur Nagar, GTL Road, Rami Reddy Colony, Shivalaya Nagar, Rajeev Gandhi Nagar

important industries in this area are those of machine tools, pharmaceuticals, electrics, textiles and chemicals. Hetero drugs limited, Dr Reddys laboratory, Hyderabad coach bus manufacturing unit, Hatsun Agro Product Ltd- milk dairy is also located in this locality.

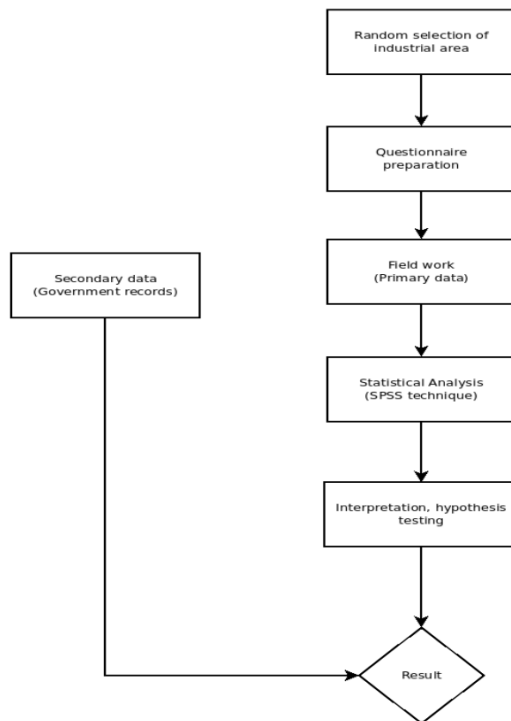
3) Nacharam Industrial Area(IDA): Colonies associated in this area –HMT Nagar, Snehapuri Colony, Green Hills Colony. Industrial area is nearly spread in 3.2 Sq.kms, Industries like Pharmaceutical

Industries, Rubber Manufacturing Industries, Iron and Steel industries, Chemical Industries are concentrated here.

4) Ramachandrapuram Industrial Area(IDA): Industrial area is spread in nearly 7 sq.kms, Industries in this area are BHEL and NTPC. Field work data is collected from the Colonies associated in this cluster are –BDL, MIG &LIG Colonies, Bharathi Nagar Colony, Bombay Colony, Ramachandrapuram Main Road, ICRISAT.

SPSS software is used for analysing the collected primary data of environmental health problems. Basic package like Ms-office will be used and Ms-excel is useful for preparing tables which will show proper analysis and clarity of understanding. “Chi square test is used for testing Hypothesis and also Richter scale is used wherever it is necessary”. Accordingly the data was compiled, tabulated and analysed to derive meaningful conclusions. Flow chart showing the methodology adopted for study the Environmental Health problems due to environmental pollution in the study area i.e. selected four Industrial areas (Jeedimetla, Nacharam, Katedan, Ramachandrapuram)of Hyderabad.

Figure3: Flow Chart





DISCUSSION AND ANALYSIS :

A) Socio Economic Profile of Study area:

Distribution of Respondents according to their Gender:On the whole male respondents are more in all four Industrial area amounting to sixty four percent (64%)and female respondents are only 36%.

Distribution of Respondents according to their Age:On the whole 35%percent of respondents are in the range of 36 to 45 years, following, 31% percent are belong to the age group of 26 to 35 years, twenty one percent belong to the age group of 46 to 55 years, 9%are in the range of 56 years and above and lastly i.e. 4% of the respondents belong to the age group of 20 to 25 years.

Distribution of Respondents According to their Education: On the whole , a little more than one fourth of the respondents i. e 28% are illiterate and remaining 72% are literates among which nearly one third of the respondents around 35% have studied up to 10th class, and a little less than one fourth of the respondents i.e. around 21% percent have studied intermediate and its equivalent education, thirteen percent have completed their Graduation and 3 percent of the respondent have studied post-graduation.

Religion Particulars of the Respondents: On the whole, data shows that 90% of the respondents are Hindus, seven percent of the respondents are Muslims and remaining three percent of the respondents are Christians.

Community Particulars of the Respondents: On the whole nearly one fourth of the respondents i.e. around 23% belong to Scheduled Caste, Only 10% of the respondents belong to Scheduled Tribe, nearly half of the respondents i.e. around 46% belong to Other Backward Class and around 21% are General.

Duration of Stay at present place by the respondents: This question was asked to respondents, because air pollution does not impact on one day or a year, to know its impact individual should have live in the area years together. On the whole 10% of the respondents were living for a period of 1-5 years, where in 11% of the respondents were living for a period of 6-10 years, around 15% were living for a period of 11-15 years, a little less than three fourth of the respondents around 65% percent were living for a period of 16-20 years.

Economic Condition of the respondents of Study Area:

And also question probed to respondents to know their economic status like type of house and employment .On the whole a little less than three fourth of the respondents i.e. around 65% percent are living in their own house where in remaining 35% percent of the respondents are living in rented house. As most of the respondents are staying for long time shown in study area, assumed that economic condition of the most of the respondents is good. A subsequent question has been asked to the respondents to know the type of house which also shows the economic condition of the respondents in study area. Respondents are lower middle class to Higher class. When respondents are living in pucca house, own house and spending good amount on housing then subsequent question has been asked to the respondents regarding their employment status to further confirmation of their economic condition. On the whole data shows that ,nearly one fourth of the respondents i.e. around 22% percent are private employees, Nearly one third of the respondents i.e. 36%percent are Daily wage workers, 9% of the respondents involved in self-employment and 6% are doing their Business, another 4% of

the respondents are Government employees and remaining nearly one fourth of the respondents i.e. 23% percent are engaged in other activities other than mentioned.

On the whole, forty percent of the respondents are satisfied with their living environment, nearly one fourth of the respondents i.e. 28% are not satisfied with their living environment and one third of the respondents i.e. 33% percent of the respondents are also not satisfied with their environment but they have said that they do not have any option or any alternative other than living there. As most of the respondents are not satisfied with their living environment, further question has been asked to respondents to know the reason for their dissatisfaction whether they are reported any pollution in terms of Air, Water and Noise in their surrounding area. On the whole data shows that, a little less than three fourth of the respondents i.e. around 65% are reported Air pollution in their respective Industrial areas.

General Health Condition of the respondents: To know their general health condition, further question has been asked to the respondents: On the whole , a little less than one fourth of the respondents i.e. around 20% are not a having any health problem and 41% percent are suffering with Other health problems other than mentioned here, remaining nearly one third of the respondents are suffering with various health problems like Back ache (four percent),Kidney problem (One percent), Diabetics (Eleven percent), Anaemia(five percent), Eye problems(twelve percent) and Nervous tensions (one percent). Nearly half of the respondents have said that they have other problems and to know the other problems of the respondents, further a subsequent question has been asked to the respondents regarding specific problems of Air pollution, in respective Industrial areas. As respective Industrial areas have lot of Air Pollution.

B) Impact of Air pollution On health of the residents of Study area:

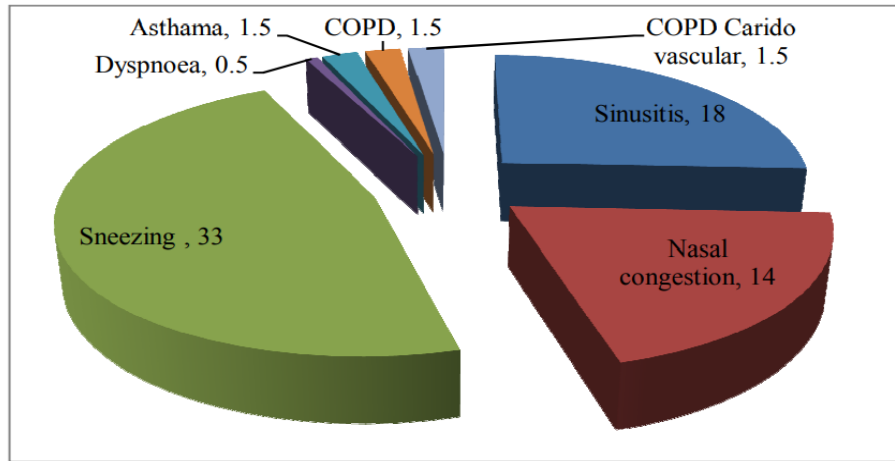
After conducting the field survey with the help of the questionnaire the data received was analysed, and we found that people were suffering with various respiratory illness as mentioned below. The following table 1 gives us and idea about the types of illness in people residing, working in industrial are suffering.

Table1: Number of Respondents Reported Health problems affected due to Air Pollution

Name of the Industrial area	Sinusitis	Nasal congestion	Sneezing	Dyspnoea	Asthama	COPD	Cardio vascular	Total
Jeedimetla	8	4	13	1	1	1	1	50
%	16.0	8.0	26.0	2.0	2.0	2.0	2.0	100.0
Katedan	15	10	21	0	2	1	1	50
%	30.0	20.0	42.0	0.0	4.0	2.0	2.0	100.0
Nacharam	5	10	22	0	0	1	0	50
%	10.0	20.0	44.0	0.0	0.0	2.0	0.0	100.0
Ramachandrapuram	8	4	10	0	0	0	1	50
%	16.0	8.0	20.0	0.0	0.0	0.0	2.0	100.0
Total	36	28	66	1	3	3	3	200
%	18.0	14.0	33.0	0.5	1.5	1.5	1.5	100.0

Source: Field Survey, October 2021

Figure4: : Number of Respondents Reported Health problems affected due to Air Pollution



Here questions has been asked regarding Respiratory problems like Sinusitis, Nasal Congestion, Sneezing, dyspnoea, Nasal Mucosal Erythema, Lung inflammation, Asthama, Chronic Obstructive Pulmonary Health problem, Intestinal Lund Health problem, Sleep disorder, Liver and other types of cancer, Cardio vascular problems. Based on the response of the respondents only seven options have been used for tabulation namely Sinusitis, Nasal Congestion, Sneezing, Dyspnoea, Asthama, COPD and Cardio Vascular. The three most common forms of illness reported are – Sneezing, Sinusitis, and Nasal Congestion. The above mentioned diseases are common in various seasons , a further subsequent question has been asked to the respondents to know their frequency of suffering with these health problems which will definitely due to surrounding environment i.e. due to Air pollution

Table 2: Number of Respondents reported affected with Sneezing Health problem due to Air pollution

Sneezing						
Name of the Industrial area	Very Often	Often	Sometimes	less often	Never	Total
Jeedimetla	0	6	6	1	37	50
%	0.0	12.0	12.0	2.0	74.0	100.0
Katedan	6	11	4	0	29	50
%	12.0	22.0	8.0	0.0	58.0	100.0
Nacharam	2	14	5	1	28	50
%	4.0	28.0	10.0	2.0	56.0	100.0
Ramachandrapuram	0	4	6	0	40	50
%	0.0	8.0	12.0	0.0	80.0	100.0
Total	8	35	21	2	134	200
%	4.0	17.5	10.5	1.0	67.0	100.0

Source: Field Survey, October 2021

On the whole, if we see Table2 , it is observed that 4% of the respondents are suffering very often with Sneezing Health problem and 18% of the respondents are suffering often with Health problem which is also very high comparatively with other Health problems like Sinusitis and Nasal Congestion and around 10% of the respondents are suffering sometimes with Sneezing Health problem. Thus we can say that entire study area suffering with Sneezing Health problem especially in Katedan and Nacharam Industrial areas, this frequency is more when comparatively with other Health problems and other Industrial areas of study area. But as the Air pollution is recorded high in the areas like Katedan and Nacharam the frequency of the Health problem affecting is witnessed more comparatively with other Industrial areas of study area and this might be increase in due course of time if further steps are taken to control the pollution which will affect the more number of people. Because Air pollution will take longer time to affect the people but once it started means within no time it will affect the more number of people living there.

Table 3: Number of Respondents reported affected with Sinusitis Health problem due to Air pollution

Name of the Industrial area	Sinusitis					Total
	Very Often	Often	Sometimes	less often	Never	
Jeedimetla	0	2	6	0	42	50
%	0.0	4.0	12.0	0.0	84.0	100.0
Katedan	2	5	7	1	35	50
%	4.0	10.0	14.0	2.0	70.0	100.0
Nacharam	0	1	4	0	45	50
%	0.0	2.0	8.0	0.0	90.0	100.0
Ramachandrapuram	0	4	4	0	42	50
%	0.0	8.0	8.0	0.0	84.0	100.0
Total	2	12	21	1	164	200
%	1.0	6.0	10.5	0.5	82.0	100.0

Source: Field Survey, October 2021

On the whole if we see a very less percent of the respondents are suffering often with sinusitis health problem and 6% of the respondents are suffering often with Health problem which is also very less. But as the Air pollution is recorded high in the areas like Katedan(Table 3) there we can see the frequency of the Health problem affecting is more comparatively with other Industrial areas of study area and this might be increase in due course of time if further steps are taken to control the pollution which will affect the more number of people. Because Air pollution will take longer time start the affect the people but once it started means within no time it will affect the more number of people living there.

Table 4: Number of Respondents reported affected with Nasal Congestion Health problem due to Air pollution

Nasal congestion						
Name of the Industrial area	Very Often	Often	Sometimes	less often	Never	Total
Jeedimetla	0	2	2	0	46	50
%	0.0	4.0	4.0	0.0	92.0	100.0
Katedan	1	4	3	2	40	50
%	2.0	8.0	6.0	4.0	80.0	100.0
Nacharam	0	3	7	0	40	50
%	0.0	6.0	14.0	0.0	80.0	100.0
Ramachandrapuram	0	2	2	0	46	50
%	0.0	4.0	4.0	0.0	92.0	100.0
Total	1	11	14	2	172	200
%	0.5	5.5	7.0	1.0	86.0	100.0

Source: Field Survey, October 2021

On the whole if we see a very less percent of the respondents are suffering often with Nasal Congestion and six percent of the respondents are suffering often with Health problem which is also very less. But as the Air pollution is recorded high in the areas like Katedan and Nacharam (Table 4) there we can see the frequency of the Health problem affecting is more comparatively with other Industrial areas of study area and this might be increase in due course of time if further steps are taken to control the pollution which will affect the more number of people. Because Air pollution will take longer time start the affect the people but once it started means within no time it will affect the more number of people living there.

Although these numbers look small while having a glance at figures at current conditions, but, in due course of time this problem may become intense if ignored for a long period of time. So, the government and the people must come together to control the problem of the Air pollution.

CONCLUSION:

Katedan Industrial Area- In Katedan Industrial area residents living in the adjacent colonies are found to be suffering with dust pollution related problems. As heavy goods vehicles are frequently moving for transportation purpose in this industrial area is leading to frequent road damages in the area. The air pollution in the form of dust due to bad condition of the road and added by the smoke is being emitted by the industries is becoming greater Air pollution concerned in the Katedan industrial area. A significant number of respondents complained having health problems due to air pollution such as sneezing, Sinusitis, Nasal Congestion and Breathing and headache. Concerned pollution control authorities have a great responsibility in minimizing the air pollution levels in the study area . In this study area as per field work it is found that Eighty six percent of the respondents reported about noise pollution, it is high time that the government should immediately act to bring down sound pollution levels in the area.



Jeedimetla Industrial Area - In comparison to Katedan industrial area Air pollution levels are found to be less where as water pollution levels reported more.

Nacharam Industrial Area - The study found that Air pollution is reported to be higher in this industrial area. However, it is to be noted that few health problems such as Hypertension and sleeplessness, anxiety irritation and Hypertension reported more in this area which are due to Noise pollution. There is an urgent need to bring down both Air pollution and Noise pollution levels in this study area.

Ramachandrapuram Industrial Area - In this Industrial area, the respondents mentioned that Air pollution is higher than all other three types of pollutions. The source of Air pollution is from the neighbouring industrial area. The study revealed that other pollutions like Water, Soil and Noise pollutions are at a lower level. The Air pollution can be brought down with the help of Government pollution restriction policies.

It is observed through the study that Air pollution problems are more in all four Residential areas which are situated near by the industrial areas. It is recommended that, the Government should come with comprehensive developmental pollution free environmental policies in order to make sure to provide clean and safe, sustainable living environment for future generations. It is suggested that concerned government agencies should strictly monitor and evaluate in stopping establishment of residential areas adjacent to the industrial areas.

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