

Industrial Development and Environmental pollution: A Case study Kadapa District

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Abstract- The development through rapid industrialization to augment the production of commodities to meet the requirements of the ever growing population in a developing economy has resulted in not only massive utilization of Natural resources but also aggravated the delivery of Industrial wastes leading to the deterioration of Environment. Improper location of Industries, use of technologies and inadequate waste treatment facilities have resulted in generating pollution culminating in the deterioration of the quality of Air, water and soil affecting the Environment causing much damage to the quality of life of the human beings. In view of this, Agrobased, Forest based, textile based, Mineral based Industry, Engineering based, chemical based Industries have been generating lot of pollution which have tendency to affect the quality of Air, and water and there by, deteriorate the Environment of their host communities, particularly lives of households in the host communities. There are growing concerns especially among various environmental stakeholders both groups and institutions, on how to abate pollution resulting from industrial activities but much has not been done to ascertain the effect of pollution resulting from industrial activities to on the well being of households.

Index Terms- Industries, Environment pollution, House holds, population

I. INTRODUCTION

‘Environment pollution ‘ means the presence in the Environment of any Environmental pollutant that is solid, liquid or gaseous substance present in such concentration as may be or tend to be injurious to the Environment. “pollution” has been defined as “ the introduction by man into any part of the environment of waste matter or surplus energy, which changes the environment directly or indirectly which adversely affect the opportunities of man to use or enjoy it”.

Rapid industrialization growth of urbanization increase in population that have lead to the enlargement of various economic activities and also increase in environmental pollution scientific and technological development has imposed much strain on the natural ecosystems beyond its carrying capacity. Improper location of industries, use of technologies that generate much pollution and inadequate waste treatment facilities, massive deforestation, have resulted in the rapid deterioration in the quality of air water and soil carrying much damage to arrival, plant and human life, which is further aggravated by the global warming up trends green house effect, acid rains, ozone depletion, etc. The air, water, soil, plants and trees, insects animals, etc. all constitute the environment. These interact with each other and maintain a proper balance called ecological balance. Environmental degradation disturb the harmony in nature and this creates the ecological imbalance.

The study of environmental pollution is a vital subject seeks suitable approaches to their solution. Economists policy makers and scientists have been trying to examine the implications of the crisis. They have developed approaches and models which are relating to economic activity and environment. The rapid economic growth achieved by most of the developing countries after globalization has adversely affected the quality of the environment. It has imposed considerable social costs and livelihood impacts and has become major menace to sustainable development. Since the citizens of poor countries may not demand a high level of environmental quality, these countries take up an export oriented

manufacturing, which is sometimes pollution-intensive. It is immensely important for developing countries to achieve a critical level of economic growth to mitigate their unemployment and poverty. Nevertheless the major challenge is to ensure development in an environmentally sustainable manner to achieve a proper trade off between environment and development. Normally developing countries may have reasonably good growth policies and strategies for agriculture, industry and infrastructure development, but they do not have a social environment management policy.

The present study is confined to estimate the impact of industrial development and its pollution on the well being of households living in the polluted areas of Kadapa District. There by the following questions were raised what is the impact of pollution on the well being of households living in the polluted areas of Kadapa District? What is impact of the pollution levels on the socio-economic development of Kadapa District? What are the effects of various types of environmental pollution such as air, noise and water pollution on people living in the industrial polluted areas of Kadapa District? What is the impact of environmental pollution on man days of labour, income and health levels of people in the industrial polluted area in Kadapa District? Answers to these questions are necessary because to achieve sustainable development it is imperative to have sustainable generations of human capital people need to live a healthy life and economic activities of industries should not affect their life span through various effects of pollution from the industries. However in most cases the effects of pollution arising from the industrial activities of firms affect the host communities of these industries. It is against the foregoing that this present study examines the effect of industrial activities and its pollution on the households of Kadapa District in Andhra Pradesh.

II. OBJECTIVES OF THE STUDY

The main objectives of the present study is to examine the impact of industrial activities particularly pollution on the well being of households in the polluted areas of Kadapa

District. However the specific objectives are given below. They are:

- To examine the effects of various types of environmental pollution such as air, noise and water on people living in the industrial polluted areas of Kadapa District.

Hypothesis:

The following hypotheses have been framed based on the above objective and research question of the study

- Industrial pollution has significantly affected the socio economic development in Kadapa District.
- Environmental pollution such as (Air, Noise and water) has significantly affected people living in the polluted industrial areas of Kadapa District.

Sample Design of the study:

Purposive sampling method has been adopted in the present study and according to the information provided by the office of Andhra Pradesh pollution control Board. There are seven types of polluting industrial units in Kadapa District. The particulars been given below in detail in table 1.1 depending upon the level of pollution caused by effluents discharge by the units. There are 4 agro based units (The Kadapa Co-operation Sugar factory Ltd was purposely selected). About 10 forest based units (Balaji Bio Mass power Pvt Ltd was purposely selected at least 6 textile based units (Sri Govindaraja Textile Pvt Ltd was purposely selected) Nearly 17 mineral based units (Sowmya Glass Pvt Ltd was purposely selected) A maximum 3 thermal power projects units (Rayalaseema Thermal power project was purposely selected) and about 8 Chemical based units (Bharathi polymers India Pvt Ltd was purposely selected. From each of the one unit has been purposively selected for the study. The village households residing in and around these units were listed out carefully. From each category about 40 house holds were selected using simple random sampling method without replacement (SRSWR). The sample size of the study comprised 280, which consist of the 15 per cent of total households. The questionnaire was designed and presented interview scheduled by conducting pilot survey. A through finalized questionnaire were administered in the sample area.

Table1.1sampledesign

S.No.	Category	Total Industry	Selected Industries	Selected Villages	Total households	Selected house holds
1	Agro Based industry	4	The Kadapa Co-operative Sugar Ltd	Dowtathapuram, Chnnur	550	40
2	Forest based industry	10	Balaji Bio Mass power pvt ltd	Kokirayapalli, Chennur	270	40
3	Textile based industry	6	Sri Govindaraja textiles Pvt Ltd	Pedhurenga puram, Pulivendula	272	40
4	Minaral based industry	17	The india Cements, Bharati Cements	Yarraguntla, Kamalapuram	2600	40
5	Engineering based industry	9	Sowmya Glass Pvt Ltd	Gundlamadugu, Thondur	278	40
6	Thermal power project	3	Rayalaseema Thermal Power Project	Muddanur	2137	40
7	Chemical based industry	8	Bharathi Polymers India Pvt Ltd	Ipptla, Lingala	260	40

Impact of Industrial pollution

Pollution is the introduction of contaminants our environment that causes instability disorder harm or discomfort to the physical systems or living organisms. Pollution can take the form of chemical substances or energy such as noise heat or light energy. pollutants the elements of pollution can be foreign substances or energies or naturally occurring when naturally occurring they are considered contaminants which exceed natural levels. Pollution is often classified as point source or non point source pollution. The industrial pollution causes air and water polluted and leads in turn to human health hazards.

Demographic profile

The age of the respondent living I the industrially polluted area is presented in table 1.2. The data reveals the total respondents living in the industrial polluted area .

Table 1.2
Age of the respondents in the industrially polluted area

Age of the respondents (year)	Agro based	Forest based	Textile based	Mineral based	Engineering based	Thermal based	Chemical based	Total
20-30	9 (20.00)	5 (11.11)	1 (2.22)	8 (17.77)	3 (6.66)	12 (26.66)	7 (15.55)	45 (16.07)
30-40	15 (17.24)	13 (14.94)	9 (10.34)	17 (19.54)	21 (24.13)	7 (8.04)	5 (5.74)	87 (31.07)
40-50	11 (14.28)	8 (10.38)	13 (16.88)	5 (6.49)	9 (11.68)	14 (18.18)	17 (22.07)	77 (25.00)
50-60	5 (7.04)	14 (19.71)	17 (23.94)	10 (14.08)	7 (9.85)	7 (9.85)	11 (15.49)	71 (25.36)
Total	40	40	40	40	40	40	40	280

Note: Figures in parentheses indicate the percentage total **Source:** Field survey data.

The table 1.2 present that a maximum of 87 respondents (31.07%) are in the age group of 30-40 years including the highest at 21 in engineering based industry (24.13%) and the lowest at 5 in chemical based industry (5.74%) followed by 77 respondents (25%) are in the age group of 40-50 years including the highest at 17 in chemical based industry (22.07) and the lowest at 5 in mineral based industry (6.49%). A maximum of 71 respondents (25.36%) are in the age group of 50-60 years including the highest at 17 in Textile based industry (23.94%) and the lowest at 5 in agro based industry (5.74%) and 45 respondents (16.07%) are in the thermal based industry (24.13%) and the lowest at 1 in textile based industry (5.74%) it indicates that majority of the respondents are in the productive age group of 30 to 40 years.

Table 1.3
Distance from the industries to the respondents residence in the polluted industry area.

Distance from industry to residence (km)	Agro based	Forest based	Textile based	Mineral based	Engineering based	Thermal based	Chemical based	Total
Below ½	26 (23.42)	22 (19.81)	4 (3.60)	22 (18.81)	20 (18.01)	17 (15.31)	-	111 (39.64)
½-1	14 (11.29)	16 (12.90)	33 (26.61)	18 (14.51)	-	23 (15.54)	20 (16.12)	124 (44.29)

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1-2	-	2 (4.44)	3 (6.66)	-	20 (44.44)	-	20 (44.44)	45 (16.07)
1-3	-	-	-	-	-	-	-	-
Total	40	40	40	40	40	40	40	280

Note: Figures in parentheses indicate the percentage total **Source:** Field survey data.

The Table 1.3 presents that 124 respondents (44.29%) have their own house which is half to one kilometer from the industry and majority of the respondents are in the textile based industry: about 111 respondents (39.64%) have their house less than half kilometer from industry and majority of them are in agro based industry. But only 45 respondents (16.07%) have their house at a distance of 1-2 kilometers from the industry where they are working and majority of them are equally in engineering and chemical based industry (44.44%). It is concluded that majority of the respondents have their have located less than one kilometer (83.93%) from industries.

Types of pollution

Air Pollution

The different industrial units which are causing Air pollution have been presented in the table 1.4

Causes of air pollution	Category of industry							total
	Agro based	Forest based	Mineral based	Engineering based	Thermal power based	Textile based	Chemical based	
Industrial smoke, dust	24 (12.37)	19 (9.79)	29 (14.98)	25 (12.88)	27 (52.38)	32 (16.49)	38 (15.58)	194 (69.29)
Vehicle smoke dust	13 (20.96)	17 (27.41)	11 (17.74)	3 (4.83)	11 (17.74)	7 (11.29)	-	62 (22.14)
Domestic smoke, dust	3 (12)	4 (16.66)	-	12 (50.00)	2 (833)	1 (4.16)	2 (8.33)	24 (8.57)
Total	40 (14.285)	40 (14.285)	40 (14.285)	40 (14.285)	40 (14.285)	40 (14.285)	40 (14.285)	280 (100.00)

Note: Figures in parentheses indicate the percentage totals

Source: Field survey data.

The table 1.4 depicts that 194 respondents (69.29%) are suffering from Industrial Air pollution of Industrial smoke and dust, including 38 in chemical based industries (19.58%), nearly 32 in textile based industries (16.49%) about 29 in Minaral based industries (14.95%) at least 27 in thermal power industries (52.38%) 25 in Engineering based industries (12.88%) 24 in Agro based industries (11.76%) and 19 in forest based industries (9.79%) moreover, smoke and dust including 17 in forest based industries (27.41%) are about 13 in agro based industries (20.96%) at least 11 each in Minaral and Animal based industries (17.74%),7 in textile based industries (11.29%) and a mere 3 in Engineering based industries (4.83%) But 24 Respondents (8.57%) suffering from Air pollution due to domestic smoke and dust and they include 12 in Engineering-based industries (50%), at least 4 in forest based industries (16.66%) 3 in Agro based industries (12%), 2 each in thermal and chemical based industries (8.33%) and just 1 in textile based industries (4.16%). It indicated that majority of the respondents (69%) are suffering from industrial Air pollution.

1.5 water pollution

The different industrial units which are causing water pollution have been presented in the table 1.5.

1.5 Causes of water pollution in the industrially polluted Area

Causes of water	Category of industries							Total
	Agro based	Forest based	Textile based	Minarel based	Engineerin g based	Thermal based	Chemical based	

pollution								
Drainage water	12 (16.00)	9 (12.00)	13 (17.33)	16 (21.33)	7 (9.33)	11 (4.66)	7 (9.33)	75 (26.99)
Industrial waste water	18 (11.68)	24 (15.58)	19 (12.33)	18 (11.68)	23 (14.93)	21 (13.63)	31 (20.12)	154 (55.00)
Industrial some dust	10 (19.60)	7 (13.72)	8 (15.68)	6 (11.76)	10 (19.60)	8 (15.68)	2 (3.92)	51 (18.21)
Total	40 (14.285)	280 (100.00)						

Note: Figures in parentheses indicates the percentage to total

Source: field survey data.

The table 1.5 presents that 154 respondents (55%) are suffer from water pollution from industrial waste water, including 31 in chemical based industries (20.12%) About 24 in forest –based industries (15.58%), 23 in Engineering based industries (14.93%),21 in Anima-1based industries (13.63%) About 19 in textile-based industries (12.33%) , and 18 in each of Agro and Mineral-based industries (11.68%) 75 respondents (26.79%) are suffering from water pollution from drainage water including 16 in Mineral-based industries (21.33%),13 in textile based industries (17.33%) , 12 in Agro-based industries (16.00%), 11 in thermol power based industries (4.66%) ,9 in forest –based industries (12%) and 7 each in Engineering and chemical based industries (9.33%) causing water pollution. Nearly 51 respondents (18.21%) are suffering from industrial smoke dust, including 10 each in agro and Engineering based industries (19.60%). 8 each in textile and Animal-based industries (15.68%), 7 in forest based industries (13.72%), 6 in Mieral based industries (11.76%) and mere 2 in chemical-based industries (3.92%). It is concluded that Majority of the respondents (55%) are suffering from industrial waste water pollution.

Impact of Pollution on humans

Impact of Air Pollution:-

The Impact of Air Pollution caused by the different industrial units has been presented in the table

Table1.6

Effect of Air pollution problem on family members of the respondent

Air pollution problem	Category of industries							Total
	Agro based	Forest based	Textiles based	Mineral based	Engi based	Thermal based	Chemical based	
Suffocation	6 (27.27)	2 (9.09)	-	5 (22.72)	-	1 (4.54)	8 (36.36)	22 (9.28)
Common cold	7 (13.46)	10 (19.23)	6 (11.53)	9 (17.30)	5 (9.06)	9 (17.30)	6 (11.53)	52 (21.91)
Eye irritation	9 (17.30)	2 (5.76)	8 (15.38)	18 (34.61)	4 (7.69)	6 (11.53)	4 (7.69)	52 (21.91)
Breath less ness	5 (13.15)	7 (18.42)	4 (10.52)	7 (15.42)	1 (2.63)	3 (7.89)	11 (28.94)	38 (16.03)
Allergy	3 (5.00)	9 (15.00)	11 (18.33)	6 (10.00)	3 (5.00)	11 (18.33)	17 (28.33)	60 (25.32)
Hair fall	1 (7.69)	2 (15.38)	-	2 (15.38)	1 (7.69)	4 (30.76)	3 (2307)	13 (5.49)
Total	31 (13.08)	33 (13.92)	29 (12.23)	47 (19.87)	14 (5.90)	34 (14.34)	49 (20.67)	240 (100.00)

Note: Figures in Parentheses indicate the percentage to total
 Source: Field survey data.

The table 1.6 portrays that 60 respondents (25.32%) are suffering from allergies, about 52 respondents (21.91%) are suffering from common cold and eye irritation, about 38 respondents (16.03%) are suffering from breathlessness, 22 respondents (9.28%) are suffering from suffocation and about 13 respondents (5.49%) are suffering from hair fall. Moreover, majority of the respondents in chemical based industry are suffering from allergy and breath lessness and majority of the respondents in mineral based industry are suffering from eye irritation. It indicates that majority of the respondents (25.32%) are suffering from allergy.

Impact of water pollution:

The Impact of water pollution caused by the different industrial units has been presented in the table 1.8

Table1.7

Effect of water pollution problem on family member of the Respondent.(problem)

Water pollution problem	Category of industries							Total
	Agro based	Forest based	Textiles based	Mineral based	Engi based	Thermal based	Chemical based	
Typhoid	3 (10.71)	5 (17.85)	4 (14.28)	5 (17.85)	2 (7.14)	5 (17.85)	4 (14.28)	28 (11.36)
Diarrhea	9 (10.84)	18 (21.68)	11 (13.25)	13 (15.66)	10 (12.07)	8 (9.63)	14 (16.86)	83 (33.60)
Dysentery	1 (3.84)	7 (26.92)	3 (11.53)	3 (11.53)	5 (15.23)	2 (7.69)	5 (19.23)	26 (10.53)
Amoebiosis	-	-	-	-	-	-	-	-
Stomachache	3 (8.10)	4 (10.81)	5 (13.516 (12.00)	4 (10.81)	7 (18.91)	8 (21.62)	6 (16.21)	37 (14.18)
Skin diseases	8 (16.00)	4 (8.00)	1 (6.66)	5 (10.00)	12 (24.00)	7 (14.00)	8 (16.00)	50 (20.24)
Indigestion	2 (13.33)	-	1 (7.69)	3 (20.00)	6 (40.00)	3 (20.00)	-	15 (6.07)
Bone	-	-	-	2 (15.38)	3 (23.07)	7 (53.84)	-	13 (5.26)
Total	26 (10.52)	38 (15.38)	-	35 (14.17)	40 (16.19)	40 (16.19)	37 (14.97)	240 (100.00)

Note: Figures in parentheses indicate the percentage to total some field survey data.

The table 1.7 shows that as many as 83 respondents (33.60%) are suffering from diarrhea about 50 respondents (20.24%) one suffering from stomach ache 26 respondents (10.53%) are suffering from dysentery and 15 respondents (6.07%) are suffering from indigestion. Moreover, majority of the respondents in forest based industry are suffering from diarrhea and skin diseases. It shows that

majority of the respondents (34%) are suffer from diarrhea.

III. CONCLUSION

Environmental Economist believe that environmental quality is a normal good and citizens of poorer countries may demand alower level of Environment quality the industrial pollution causes water, Air to be polluted and in turn becomes human

health hazard. Majority of the respondents (69%) are suffering from Industry Air pollution of Industrial smoke and dust. And 55 percent of the respondents, from waste water pollution typhoid, Diarehea, stomach ache, skin diseass are major impact of water pollution on the respondents in the study area.

Industrial development has played a crucial role in development strategy particularly with regard to the objectives of structural diversification, Modernization and self-reliance. The sustenance of development is necessary to meet the requirement of country. Industrial development has to be augmented through the exploitation and certilization of the resources in the most economical and efficient manner. Industries is also providiny Employment and Income to vast masses of people so that they can eradicate poverty and enrich the standard of living of the people. The industrial development regulation act gave very wide powers to the government. This resulted in more or less complete control by the bureaucracy on the industrial development of the country.

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