

“Impact of Environmental Pollution on Human Health and Agricultural Productivity: Analytical study of Paper Industry in Kashipur Area of Udham Singh Nagar (Uttarakhand)”

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Abstract

Industrial pollution is an environmental problem faced by most of the new industrial economies today. Pollution not only affects people but also adversely disturbs economic development in the long run.

Kashipur is known as a major industrial area in the state of Uttarakhand. It is developing into a manufacturing base for paper and paper products, food products-based industries and other packaging materials. It is a chief centre of the paper industry. The paper industry emits a variety of pollutants and produces a variety of health effects. It largely discharges solid waste and untreated industrial waste. Since the intensity of pollution varies across industries, this paper attempts to take a look at the environmental impacts of the paper industry in the Kashipur area of Uttarakhand. It is clear from the analysis conducted in the study that gastritis, blood pressure, jaundice, skin and eye problems have increased in the area. Agricultural production is also being affected. The results of the present study are based on information obtained from a questionnaire, a focus group discussion and observations from various fields. The paper industry has also created employment opportunities in various activities which have increased the standard of living of the people.

Key words : Paper Industry, Environment, Pollutants, Diseases, Human Health, Agricultural Productivity.

Introduction

The Paper industry is one of the major industrial manufacturing sectors in India. It plays an important role in the overall industrial development of our country. It also provides an essential medium for promoting our knowledge-based economy in the new millennium. The paper industry has certainly developed the economy of India and the lifestyle of the people living in the country, but at the same time, it has also created environmental pollution. Unlike other manufacturing industries, the pulp and paper industry consumes large amounts of energy and emit a variety of pollutants. These pollutants contain hazardous chemicals that adversely affect human health and agricultural productivity. The waste generated by the paper industry causes serious harm to aquatic life and causes a variety of health effects. The effects of pollutants on the environment have been assessed many times, but their mitigation is still a significant challenge. In this review, we have highlighted the effects of some primary pollutants released from the paper industry on human health and agricultural productivity. Environmental compliance requires strict action and the implementation of regulatory models in this industrial sector.

Paper Industry in Uttarakhand

Most of the paper industry in Uttarakhand is located only in the Tarai region of Kumaun, which is the plain region. The region is rich in agricultural production both in terms of quality and quantity. Kashipur Tehsil in Udham Singh Nagar district has the highest concentration of pulp and paper industry, while Lalkuan in Nainital district has the largest pulp and paper industry.

Study Area

Kashipur is a major industrial area located in Udham Singh Nagar district of Uttarakhand state of India. It is a major centre of the paper industry. It is surrounded by the Moradabad, Rampur and Bijnor districts of Uttar Pradesh and the Nainital district of Uttarakhand. It is situated at an altitude of 239 meters above sea

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level and latitude of 29.21 and a longitude of 78.96. According to the 2011 census, “the total population of Kashipur Tehsil is 283,136, out of which 148,747 is males while 134,389 is females. 49% of the people of Kashipur tehsil live in urban areas while 51% live in rural areas. The total literacy rate of Kashipur Tehsil is 77.68%, of which a male literacy rate is 72.69% and a female literacy rate is 60.7%”.

The area of Kashipur is rich in agricultural production. Rice and wheat are the main cultivated crops here. The area had a favourable climate before industrial development. There were no specific problems related to agricultural production and human health. The industrial status of the Kashipur area has increased after the establishment of paper mills, but at the same time, it has also created environmental pollution. The wastewater, harmful chemicals and gases released by these mills are hazardous to human health. The smoke emitted from the mills is affecting not only human health but also the yield of crops. The cost of production is increasing due to diseases in crops. The natural and physical environment of the area is changing rapidly due to pollution.

Objectives of the Study

1. To know common health problems of the people due to pollution.
2. To examine the impact of environmental pollution in the context of a decline in agricultural productivity.

Review of Literature

Various research papers available on this topic were studied. Several research papers related to the impact of environmental pollution on agricultural productivity and human health were reviewed. After the review, diseases caused by pollutants and their impact on human health have been studied.

Kesalkar et al ... (2012) observed that most of the pulp and paper industry discharge their wastewater into the river or drain resulting in serious problems for aquatic organisms. Reddy et al ... (2013) studied that the discharge of effluents from the paper industry changed the physical, chemical and biological properties of soil. Sarma, Bhupen Kumar (2014) studied that paper mills discharge wastewater and various types of chemicals. Due to which asthma, blood pressure (BP), gastritis, jaundices, diarrhoea, and eye and skin problems increase. It also affects agricultural productivity. Sharma Manju and Chaudhary Smita (2014) studied that common respiratory problems were more prevalent in paper mill areas. Asthma and fever were found in high quantity in thermal power plant and sugar mill area respectively. However, the problem of air pollution was found more in thermal power plants and the problem of water was found more in sugar and paper mill areas.

Research Methodology

The present study is based on the impact of environmental pollution on agricultural productivity and human health. Primary data has been collected from the selected respondents using a questionnaire. This information has been collected through door-to-door interviews. The questionnaire has been prepared concerning socioeconomic status, drinking water source, general and allergic health problems, water borne diseases etc. The purpose of the questionnaire is to obtain information about the impact of industrial pollution on human health and agricultural production. Four villages have been purposely selected keeping into consideration the representation of villages within a radius of three kilometres at different distances from the paper mills. The total sample size of the data collected is 80 (20 interviews in each village). The main sources of secondary data are government documents, research reports, research papers, articles and websites etc. Census 2011 data has also been collected to know the demographic profile of the study area.

Result and Discussion

1 - Damage to Health

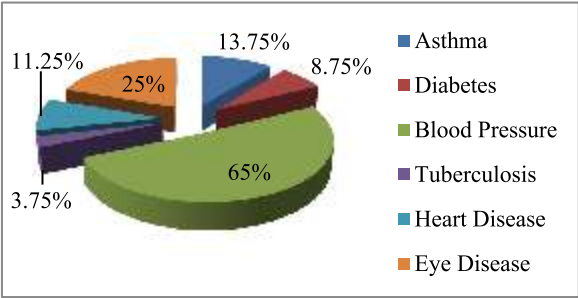
The data obtained from the survey shows that industrial pollution has adverse effects on human health and agricultural productivity. The following tables show the impact of pollution in the study area.

1.1 - Chronic Diseases

The study shows that 65% of the respondents experience the problem of high blood pressure. 13.75% respondents experienced asthma, 8.75% diabetes, 3.75% tuberculosis (TB) and 11.25% respondents experienced heart problems. 25% of total respondents experience eye problems. It is clear from the analysis that most of the respondents are suffering from the problem of hypertension. (Table-1.1 and Figure 1.1)

TABLE - 1.1: Chronic Diseases

S.N	Chronic Diseases	Total
1.	Asthma	13.75
2.	Diabetes	08.75
3.	Blood Pressure	65
4.	Tuberculosis	03.75
5.	Heart Disease	11.25
6.	Eye Disease	25



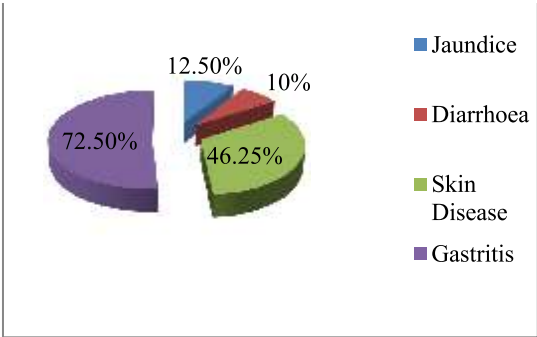
(Data Source: Primary Survey) **Figure-1.1: Chronic Diseases**

1.2 - Endemic Diseases

The data obtained from the survey shows that 12.50% of the respondents feel the problem of jaundice. 10% of the respondents feel diarrhoea, 46.25% skin problem and 72.50% gastritis out of total respondents. It is clear from the analysis that gastritis and skin problems are increasing the most among the respondents in the study area. (Table-1.2 and Figure-1.2)

TABLE - 1.2:Endemic Diseases

S.N	Endemic Diseases	Total %
1.	Jaundice	12.50
2.	Diarrhoea	10
3.	Skin Disease	46.25
4.	Gastritis	72.50



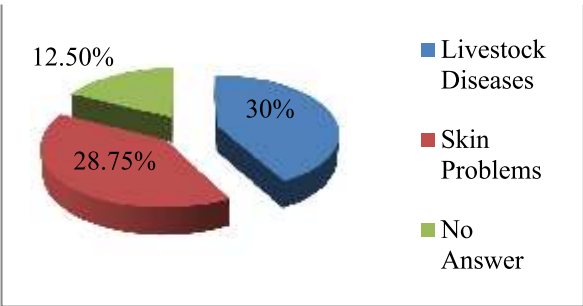
(Data Source: Primary Survey) **Figure-1.2: Endemic Diseases**

1.3 –Impact on Livestock

The study of the area reveals that 30% of the respondents realize the health hazards due to pollution in their livestock. 28.75% feel skin problems. 12.50% of total respondents have no answer about the impact of pollution on livestock as presented in Table -1.3 and Figure -1.3.

TABLE – 1.3:Impact on Livestock

S.N	Health Problems	Total %
1.	Livestock Diseases	30
2.	Skin Problems	28.75
3.	No Answer	12.50



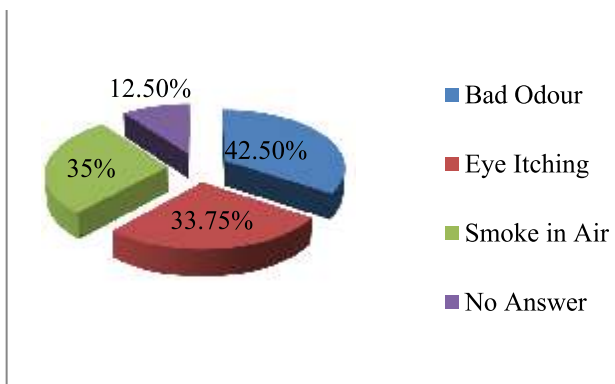
(Data Source: Primary Survey) **Figure-1.3:Impact on Livestock**

1.4 - Realization of Air Pollution

The table shows that 42.50% of the respondent's experience air pollution in the form of foul smells. 33.75% experience air pollution in the form of itchy eyes and 35% experience it as smoke in the atmosphere. 12.50% of total respondents did not respond to air pollution due to industrial activities as presented in Table-1.4 and Figure-1.4.

TABLE – 1.4: Realization of Air PollutionReferences

S.N	Way of Feel Air Pollution	Total %
1.	Bad Odour	42.50
2.	Eye Itching	33.75
3.	Smoke in Air	35
4.	No Answer	12.50



(Data Source: Primary Survey)

Figure-1.4: Realization of Air Pollution

2 - Low Agricultural Productivity

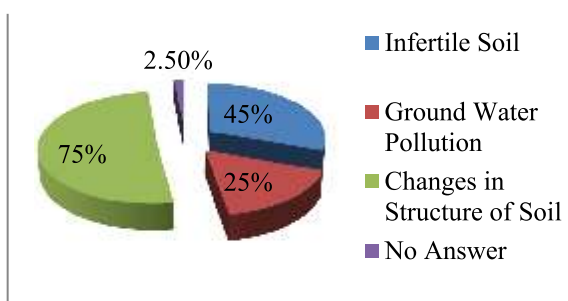
The paper industry discharges a variety of air and water pollutants. These pollutants contain hazardous chemicals that can adversely affect agricultural productivity. The following table shows the impact on agricultural productivity due to pollution in the study area.

2.1 - Causes of Low Agricultural Productivity

The table shows that 45% of the respondents consider barren soil to be the reason for low agricultural productivity. 25% blame ground water pollution for low agricultural productivity. 75% of the respondents attributed the change in soil composition to low agricultural productivity. 2.50% of total respondents have no answer on the reasons for low agricultural productivity due to pollution. (Table-2.1 and Figure-2.1)

TABLE - 2.1: Causes of Low Agricultural Productivity

S.N	Causes	Total %
1.	Infertile Soil	45
2.	Ground Water Pollution	25
3.	Changes in Structure of Soil	75
4.	No Answer	02.50



(Data Source: Primary Survey)

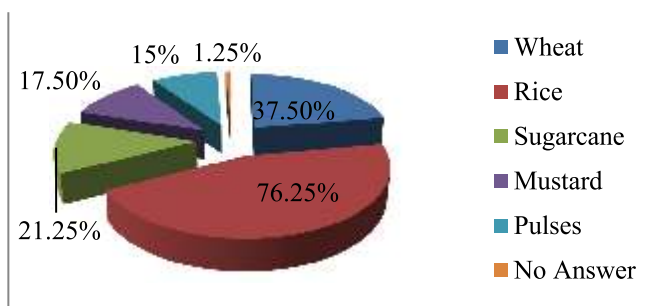
Figure-2.1: Causes of Low Agricultural Productivity

2.2–Effect on Crops

Based on the survey, it is found that 37.50% of the respondents in the study area felt the impact of pollution on wheat yield. 76.25% of the respondents felt the impact of pollution on rice yield, 21.25% sugarcane yield and 17.50% mustard yield. 15% of the respondents feel that the yield of pulses has been affected. 1.25% of the total respondents do not react to the impact of crops. It is clear from the analysis that rice production is being affected the most in the study area. (Table-2.2 and Figure-2.2)

TABLE - 2.2: Effect on Crops

S.N	Crops	Total %
1.	Wheat	37.50
2.	Rice	76.25
3.	Sugarcane	21.25
4.	Mustard	17.50
5.	Pulses	15
6.	No Answer	1.25



(Data Source: Primary Survey)

Figure-2.2: Effect on Crops

Conclusion:

Kashipur area is one of the developed areas of Uttarakhand. The developmental activities due to industrialization and urbanization in the area are largely responsible for pollution. As far as the impact of environmental pollution is concerned, it is observed that human health and agricultural production are being adversely affected in the study area. Gastritis, blood pressure, jaundice, skin and eye problems have increased in the area. In terms of agricultural productivity, rice production is being affected the most and the composition of fertile soil is changing. Industrial pollution is a major problem in our country, but people do not care about it because they give importance to problems like poverty, hunger, unemployment. No doubt these problems are of utmost importance, but pollution is also a serious problem. The effects of pollutants on the environment have been assessed many times, but their mitigation is still a significant challenge. To tackle the problem of pollution, there is a need to increase the pollution control standards.

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