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Impact of industrial Pollution on Environment and human health A case study of Durgapur, West Bengal

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Abstract:

The history of Durgapur as an Industrial belt is nearly seventy-five years old. Durgapur has emerged as a prosperous township owing to the growth of several industries. We know that development brings prosperity and economists chart the time (?) of development according to statistics. However, no one measures the decline in human lifespan caused by uncontrolled pollution from these industries. Industrialization casts a shadow on the environment and jeopardizes the foundation of societal well-being and human principles. This will be the focus of this article. It is also discussed in this article how pollution from these industries is creating an impediment in the nearby locality. Environment of pollution is vitiating the social atmosphere. The poison in water and the air is being absorbed by the body and the mind. The polluted air is darkening the future generation. This generation is growing up with physical and mental illness.

The study is based on primary and secondary data which have been collected from various books, different journals, articles, websites etc. Some were acquired through interviews with local people and some were collected from various government documents and magazines.

Keyword: Industrialization, pollution, Environment, Durgapur, Asansol Durgapur Development Authority (ADDA), Human health.

The issue of industrial pollution ranks among the gravest challenges confronting humanity and other life forms on our planet at present. In the Burdwan District of West Bengal especially Durgapur- Asansol industrial area, some new factories have been established, especially in the iron and steel sector. Since the beginning of the 1990's to till date a large number of sponge iron and Ferro Alloy manufacturing factories have mushroomed here. This study was undertaking in the Durgapur industrial complex situated in the PaschimBurdwan District of West Bengal, India. Many industries consistently release smoke and harmful gases into the atmosphere, which not only jeopardizes human health but also harms the natural environment. Actually, the greenery has drastically reduced with urbanization and industrialization. Its effect has fallen on the environment and the lives of

the inhabitants. The main objective of this article is to assess the socio-economic impact of industrial pollution and propose environmentally and health-friendly measures to combat this escalating issue.

The challenge in the environmental sector includes water and air pollution, causing widespread health-related diseases and issues. Life on us have become dangerously unfit for survival due to pollution. Pollution has many damaging effects on human health and social welfare. Many diseases are associated with the pollutant environment, and this pollutant environment has so many disadvantages on human health.

The location chosen as a sample for this article is West Bengal, Paschim Burdwan District Durgapur region in 35 number word Gopalmath area. It is under Durgapur Municipal Corporation. The area is very polluted because it is situated near factories. This polluted environment is creating a barrier to the production and consumption of it inhabitants and also healthy living. This pollution has a deteriorating effect on the land, water and air of this area. I have selected the period for this article 1991-2011.

The study is based on primary and secondary data which have been collected from various books, different journal, article, website etc. Some acquired through interviews of local people and some were collected from various government documents and magazines. I had to depend on direct evidence to evaluate the effect of factories on the environment. The primary data was collected directly from the field survey through a questionnaire method. A door-to-door survey was conducted by using of random sampling technique. Published data from various departments and authorities- like the Districts Census handbook of Burddhaman, District Gazetteer of Burddhaman, Durgapur Municipal Corporation (DMC), Asansol- Durgapur Development Authority (ADDA), Durgapur Pollution Control Board etc. this data was consulted for the present work. Secondary data have been collected from relevant writings of some books, scholars' journalswhich is available onthe internet.

Durgapur situated at coordinates 23.55°N 87.32°E, Durgapur boasts an average elevation of 65 meters (213 ft) and resides within the Paschim Bardhaman district of West Bengal, adjacent to the Damodar River as it nears the fertile plains of Bengal. The terrain undulates gracefully, with the proximity of the Raniganj coalfields lending its coal-bearing essence to the landscape. Once shrouded in dense forests, remnants of the original Sal, Palas, Mahua tree and eucalyptus woods linger, offering glimpses into the region's rich ecological history.

Map of Paschim Bardhaman District

Source: From Durgapur Municipal Corporation, Durgapur

According to the 2011 census, the Durgapur Urban Agglomeration had a total population of 566,517, with 294,349 males and 272,588 females. The population aged 0-6 years stood at 50,512, with an impressive literacy rate of 87.70%. The Durgapur Municipal Corporationen compasses three census towns: Bamunara, Arra, and partially Andal. Durgapur, situated along the banks of the Damodar River and in close proximity to the Raniganj coalfields, stands as West Bengal's largest industrial center and one of India's foremost industrial hubs. Designed as a fully integrated industrial city, it plays a pivotal role in the economic landscape of the region.

History of Industrial Development in Durgapur: Durgapur is situated 158 km west of Kolkata and by rail road, it is 171 km distance form Kolkata. It is 24°15' north and 87°55' east in geographical map.[1] In 1950 Durgapur was a green valley which was covered with the dense forest of Sal and Mohua tree. According to the census report of 1951, Durgapur was a union under the Faridpur police station in Asansol subdivision. In this report, Faridpur police station was described as a rural area.[2] This area was enriched with forest resources. There was a dense forest of Sal, Palash, Mohua and kendulitrees. From many times before World War II, the forest was a great workplace forthe wood business. In the Durgapur area, one of the renowned business organizer of wood was the Bengal Coal Company, which was established in 1843 collected woods from this forest.[3]

The advantage of the infrastructural facility of this area which was suited for an industry helped Durgapur to became as "Ruhr of India". The Chief Minister of West Bengal Dr. Bidhan Chandra Roy decided to build up this place as an industrial area because of the sufficiency of superior quality coal at Asansol near Durgapur, Jhoria, Dhanbad, iron at Singhvum, limestone at Veermitrapur, dolomite at Gangpur, the supply of water and current

from DVC, transport availability of eastern railway and national highway, availability of labour and land resources. The outline of the Industrial Complex was clearly Durgapur at 1955.[4]

In 1955 under the administration of Durgapur Industrial Board the primary planning for the establishment of an industry were organized. Durgapur Development Authority was established in 1958 as per a law of West Bengal because soon there was created the possibility for developing larger projects. This organization was joined with Asansol Planning Organization in 1980 and this joint project is called Asansol Durgapur Developing Authority.[5]

Many factories were established in Durgapur from the late 1950s to the early 1960s and 1970s,[6] the short descriptions of the factories are recorded here. Among the State-Controlled Nationalized Industries notable are Allied Steel Plant (1963). Mining and Allies Machinery Corporation (1959), Durgapur Chemicals (1963), Bharat Ophthalmic Glass Limited (1965). Hindusthan Fertilizer Corporation (1966) and among the private companies notables are Philips Carbon Black (1958), ACC Babcock Limited (1960), Shanky Wheels (1963).... etc. But new steel factories are established uninterruptedly and these factories are known as mini steel plants. Mainly they produce sponge iron and Ferro - alloy and some of them are rolling and casting factories.[7]As per Census 1991[8] the population of Durgapur was 4,28,000, in the Census 2001[9] it was 4,96,000, in the Census 2011[10] it was 5,66,517**.**

Photo: Durgapur Steel Plant

Source from Internet

In the Burdwan district of West Bengal, some new factories have been set up, especially in Iron industry besides the closure of many factories in the Durgapur Industrial Belt. In the time of from 1991. These factories are known as Mini Steel Plants. These factories mainly manufacture Sponge Iron and Ferro Alloy and are engaged in Rollin & Cast iron factories.These factories are spread all over the Durgapur Industrialization Belt. As per Administrative Report[11] (2007-2008) there are 47 large scale and 194 small scale industries in Durgapur Municipal Corporation. Industrial land use also increased from 0.72 sq. km. in 2008-2009 to 1.42 sq. km. in 2012-2013. These industries are creating a negative effect in the lives of the surrounding community.

Durgapur, situated within the Raniganj Coal-field area in the Burdwan district of West Bengal, has witnessed rapid industrial, vehicular, and infrastructural growth over the past decade, leading to a surge in air pollutants adversely affecting both the populace and the environment.[12]

Photo: Duragapur Project Limited,
Source by Internet

The roads in the vicinity clearly exhibit the re-suspension of dust and particulate matter, a common sight in an industrial city like Durgapur where heavy trucks contribute significantly to vehicular pollution. Concerns arise regarding the possible use of adulterated fuel by commercial and hiring vehicles, exacerbating the severity of pollution. Elevated concentrations of suspended particulate matter further deteriorate air quality, exacerbated by the presence of the Durgapur Industrial Area housing major steel plants like Durgapur Steel Plant (DSP) and Alloy Steel Plant (ASP), alongside numerous large and small-scale

industries. Emissions of sulphur dioxide, carbon monoxide, Nitrogen oxide, chloro-fluorocarbons, ammonia, fly ash particles and other toxic materials compound the environmental challenges posed by industrial activity.[13]

Direct and Indirect effects of environmental pollution on local residents: The polluted atmosphere has adversely affected the output of paddy. In the 1960s the low lands of Gopalmath area used to the cultivated by farmers like Animesh Ghosh[14], Ratan Bauri[15], Sunil Garai[16] and Budhan Bauri[17]. Under the present circumstances farming has stopped. The farming community has experienced the problem of early sort from factories covering the trees and crops of the area, resetting on the reduction of crop formation. The expense of farming par bigha, though remains the same; yet there is a reduction in crops output. As a result, farmers are becoming more and more uninterested in farming. The land remains arid year after year. The farmers, in order to sell their labour and feed their stomachs, enter the factory gates and are proclaimed missing in the mines. And we are led to believe how easily the simple farmers turn into anti-socials.

The inhabitants have let us known of the facts that during summer 50ft deep wells aredry up. As a result they have to dig 75ft wells. Here the water level is gradually sinking and the previous wells are gradually bang abandoned. The reason behind it lays the fact that certain factories, situated not far from Gopalmath, use submersible pumps to extract underground water. As a result the water level has fallen. Rice cultivation is suffering because of lack of moisture in the fields. The industries of the area have informed that the number of wells at Gopalmath is around 20,000. Since the wells are situated close to each other, the water level is gradually falling. Another possible reason is the fact that the depth of the Damodar riverbed is also reducing due to accumulation of salt, sand etc. as a result the water level is falling.[18] Red layer of iron is seen on water of ponds and wells in Gopalmath. Early in the morning a thin layer of dust covers the water in the ponds and wells of Gopalmath. Though drinking water is provided gastroenteritis to the inhabitants of this area by Durgapur Municipal Corporation (D.M.C). Yet the polluted pond water is utilized from bathing and washing by the families of labourers.

The water supplied by Durgapur Municipal Corporation lasts only one hour on the mornings and evenings. In summer, if by chance for some reason Durgapur Municipal Corporation stops water supply for one day, the labourer families are forced to ingest the polluted pond water and cook in it. As a result (especially in the Hari, Bauri, Santal, Ruidasneighborhoods) children suffer from stomach ailments.[19]

There are many such families in Gopalmath who earn their families by selling milk. Also there are some families which keep cows for their own supply of milk. These families have informed that as a result of factories, land emission of soot, the pasture for cattle is gradually reducing. The green fodder is reducing because the hay covered with soot and dust is unfit for cattle consumption. As a result the quantity of milk is decreasing so people no longer keep cows for selling milk. Currently, the demand for packet milk has increased. So people reservedly engaged in selling milk are gradually taking to antisocial activities.[20]

The Slag Bank is about 1½ km from Gopalmath. Slag is the waste product of iron. D.S.P. dumps slag in the Slag Bank near Gopalmath. The dropping of slag creates a terrible sound. The houses tremble in the sound. With the onset of evening, this terrible sound lasts about three minutes every three to four hours. In the morning this sound cannot be heard. But nochilds trembles to this sound because he is attuned to it since birth. Some amount of this slag is used by Birla Cement Factory for its production.[21]

A woman showing her hands turned black with coal dust at Piyala village in Durgapur photo by Gurbindar Shing. Reporter Gaon connection 5th May 2022.

The operations of cement plants exert a profound impact on human health, particularly on the respiratory system. In addition to respiratory issues, ailments such as gastrointestinal problems and skin disorders can arise due to water contamination from these plants. Dust emissions from metallurgical activities exacerbate respiratory problems. Furthermore, the discharge of effluents contributes to the greenhouse effect, exacerbating environmental concerns such as land erosion, salinization of grazing areas, reduced fertility of agricultural lands, acid rain, water pollution, and the release of harmful gases into the atmosphere.[22]

The aforementioned detrimental pollutants predominantly contribute to significant environmental burdens. As per the World Health Organization, approximately 70% of illnesses stem from water contamination.Pollution stemming from diverse industrial sectors continues to escalate in developing nations, further complicated by their lower level of advancement.23 The summer heat is unbearable at Gopalmath as it is very near to factories. The Aged inhabitants of the area have informed that during the 1960s the heat was bearable at summer. But at present the heat has increased beyond endurance during summer. Since the Slag Bank is very near, the inhabitants suffer from the emanating heat. Added to it, is 'Global Warming. The inhabitants of the area have also informed that recently that as a result of installation of Dust Catcher by Birla Cement Factory, dust pollution has proportionately reduced. However during the evening as night the amount of pollution

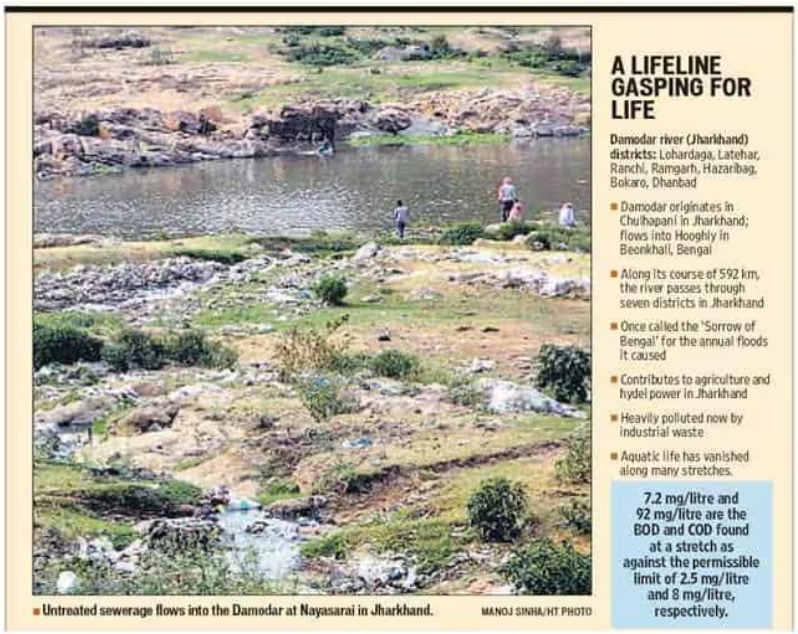
increases. A possible reason for this is inadequate pollution control at night by most of the factories.[24]

In this research area, it's evident that women are disproportionately affected by disease prevalence. This could stem from the typical roles and routines within the community. Traditionally, women undertake tasks such as cooking, cleaning, childcare, and domestic chores, which often involve water. Water-related chores in households are predominantly managed by women. Additionally, adult males, particularly those engaged in agricultural work, also face significant health risks due to frequent exposure to contaminated water sources.

The segment of the Damodar River spanning from Asansol to Durgapur is inundated with a diverse array of wastewater emanating from various industrial and residential origins. Research indicates that the water quality within this region is highly detrimental to both aquatic organisms and human utilization. The sedimentary content, particularly heavy metals, surpasses permissible levels by up to tenfold, hindering the river's natural recuperative abilities and causing bioaccumulation in fish populations. It is imperative to promptly establish wastewater treatment facilities for both domestic and industrial sectors to preserve and regulate this vital river ecosystem.[25]

Waste generated by a power plant.

The Damodar river also faces a menace of fly ash. Photo by Internet



Garbage, Industrial waste turns Damodar to stagnant mass of slush :
Photo taken from Hindustan Times, by Sanjoy De, 4th January 2015.

This pollution is not only a hazard to health, but also to local resources and the standard of life of the people. Because of environmental pollution, social health is endangered. Social health is endangered today. The poison of water and air is gradually transmitted from the body to the consciousness. Poisonous air is darkening the next generation. Here the next generation is being raised with physical and mental ailments. The poison of water and cur is gradually spreading to the body and consciousness. The poison air is gradually destroying future generations. They are growing up with physical and mental illness.

In this condition the question that naturally comes up is this-what role is the Durgapur Pollution Control Board playing to control the situation. Durgapur Pollution Control Board informed that pollution measuring instruments have been set up in Durgapur City Centre, Benachiti, Philips Carbon and their places. However, in Gopalmath Area work is yet to begin. However Durgapur Steel Plant (D.S.P) has set up Pollution Central Machines and 'Dust Catcher'.[26]As a result pollution has controlled. But inhabitants of the area refuse to recognize the role played by the Board. It is their opinion that pollution has increased and the administration is indifferent. There's no disputing the fact that pollution represents a grave danger to human health.

Direct evidence had to be relied upon to assess the impact of factories on the environment and felt the strong smell of Sulfuric Acid (H_2SO_4) almost every morning and also throughout the day the black smoke and dust from Durgapur Steel Plant and Cement Factory polluted the environment. Every evening the air in Gopalmath area turns reddish

because very near (1.5 km) situated Durgapur Steel Plant, DTPS (Durgapur Thermal Power Station) and Birla Cement Factory. Because of this pollution, the inhabitants of Gopalmath have become endangered.

Conclusion: The findings of the present study concluded that it is very true the residents of industrial areas are facing different health and environmental problems. Chemical substances emitted from industries have an adverse effect on human health. Headache and fever/malaria were identified as the major common health problems faced by the respondents. In aspect of prevalence of some other associated diseases high blood pressure, asthma, cardiovascular and respiratory diseases were reported in majority among the respondents. The results of the study reveal that industrial pollution has a far-reaching impact on human health especially on the neighbourhood inhabitant's health and workers of the industries.The government, Society, and industry must unite efforts to implement proactive measures for pollution control and environmental conservation. In the context of the overall discussion, it can be said that today this crisis is of great importance at the moment of afforestation. Green belts need to be developed between factories and residential areas through government initiatives and joint efforts of local residents. The location of the factory should be away from residential areas. At least 30% of the habitat area should be green. If necessary, smokeless fuels should be used instead of fossil fuels. It is desirable for the administration to maintain a strict monitoring system so that the factories keep the pollution control devices running even at night.

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