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A Polluted India's Crisis

India, home to more than 1.4 billion people, grapples with a pollution crisis that imperils public health and economic prosperity. While much attention has been focused on the water contamination plaguing its cities, the nation also contends with widespread air pollution. India's pollution problems have a global impact as in the fast fashion industry and the toxic pollutants that come with the production. Mitigation strategies are developing rapidly but the heal process will be a long and tedious journey.

India's air quality crisis is staggering in scale and severity, with the entire population exposed to unhealthy levels of ambient PM2.5 emitted by factories, vehicles, and other sources. Of the world's 30 most polluted cities, 22 are in India, including Delhi, Kanpur, and Varanasi, where air pollution levels exceed safe limits. Such pollution diminishes the quality of life and leads to many health risks, potentially reducing life expectancy by up to nine years for millions of Indians, particularly in northern regions (“India Air Quality Index (AQI) and Air Pollution information”). I have firsthand experience of this air pollution since most of my family lives in India and my family regularly plans vacations all across India, the pollution has become so

commonplace and has been there so long that people simply don't care about the polluted water and air. The streets are littered with newspapers and trash while the gutters that line the road have wild boars and dogs living in them. Additionally, My brother has slight asthma that only flares up in India because of how polluted the air is there, it's so bad that he cannot go outside during the rush hours because of the increased air pollution when we visit.

In parallel to the air pollution crisis, India contends with widespread water contamination, with 70% of surface water sources infected by pollutants. Industrial effluents, agricultural runoff, and untreated sewage discharge degrade the water quality, rendering it unfit for consumption and domestic use. For example, the Yamuna River in Delhi is so polluted that it has turned frothy with toxic foam, causing health hazards for those who come into contact with it. TWC India states, "Some illegal jeans-making units set up close to the river banks are also known to dump chemical waste—mainly the substances used to dye denim—in the holy river. High levels of ammonia from other chemical pollutants contribute as well." This means India's fast fashion industry is a large contributor to India's pollution problems (TWC India). Additionally, many religious bodies of water have been contaminated such as the Ganges which is a sacred river with 5 million living along it and an estimated 2 million ritually bath daily in it. The consequences are dire since contaminated water sources contribute to the spread of waterborne diseases and chronic health conditions, disproportionately affecting vulnerable populations with limited access to clean water and sanitation facilities.

The environmental and public health challenges faced by India are interconnected by water and air pollution. Contaminants leaching into bodies of water into soil and groundwater

can contribute to air pollution through the release of organic compounds and hazardous gases. Moreover, when contaminated water is used for irrigation it will compromise the crop quality and the food safety, amplifying health risks for the consumers. Thus, addressing both air and water pollution in tandem is essential to break the cycle of environmental degradation.

There are several factors that contribute to India's pollution crisis. These being, urban air pollution from vehicular emissions, industrial activities, and fossil fuel-burning power plants, intensified by seasonal factors such as agricultural stubble burning. Similarly, water pollution arises from industrial discharge, agricultural runoff, and inadequate sewage treatment infrastructure. The lack of strict regulations and enforcement mechanisms in place further intensifies these issues, perpetuating a cycle of pollution. For example, Kanpur's eastern district contains around 350 industrial leather tanneries. These tanneries produce many pollutants, the most toxic of these being metal contaminants such as chromium, mercury, and arsenic. Pure Earth states that "Chromium is the most worrisome of these: popular in the tanning industry because it makes leather goods stronger, its waste form—hexavalent chromium or Cr VI—is known to cause lung cancer, liver failure, kidney damage, and premature dementia." These tanneries also affect people after they are discontinued as old chemical plants that support these tanneries release pollution and cause a myriad of health problems that continuously plague the people living near them (Pure Earth).

The impacts of air and water pollution on public health and the economy are profound. Pollution-related illnesses significantly burden healthcare systems, leading to increased healthcare work and lost productivity. Singh states, "Air pollution is the second biggest factor

affecting human health in India, and its economic cost is estimated to exceed USD 150 billion annually...” These costs greatly hinder economic growth. Additionally, environmental degradation and water scarcity greatly intensify inequalities, particularly in rural and marginalized communities reliant on natural resources for their livelihoods.

Addressing India's pollution crisis requires a comprehensive and highly coordinated approach. Mitigation strategies should include regulatory interventions from officials, technological innovations, and community engagement initiatives to spread awareness. Strengthening environmental regulations to reduce emissions from industries and vehicles is necessary, alongside investing in cleaner energy sources and wastewater treatment infrastructure. Promoting sustainable agricultural practices and water conservation measures can further mitigate pollution from agricultural activities, while public awareness campaigns will spread awareness of the problem and how to avoid it to the public. For example, Pure Earth is a company that spreads awareness and tackles pollution problems that mainly contain mercury and lead poisoning, they also work in conjunction with local governments to solve these pollution problems. Currently, they have a project in the works to remove the chemical output of an old chemical plant near a settlement known as Noraiakheda.

In conclusion, India's pollution crisis, caused by air and water contamination, poses several formidable challenges to India's public health, environmental sustainability, and economic development. Tackling these issues requires efforts from policymakers, industries, and society as a whole. By implementing pollution mitigation strategies that address both air and

water pollution, India will forge a path toward a cleaner, healthier future for India and its citizens, safeguarding the environment for generations to come.

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