**The Smog Challenge and Pakistan**

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Environment specialists first used the term smog at the start of the early 1900s to define a deadly mix of fog and smoke. Smog is mainly formed above urban centres and cities and is composed of tropospheric ozone (O3). The primary garrulous matter includes volatile organic compounds(VOCs), dust and pollen, and secondary particulate matter such as carbon monoxide, nitrogen oxides, and sulfur oxides. The original smog- a combination of smoke and fog–occurs when the factory’s emissions burn coal combined with fog. Smog could be either summer smog or winter smog.

The main causes of smog are coal burning, fireworks, burning of agricultural material, brick kilns, excessive waste production, various construction activities, vehicles and industrial emissions, overpopulation, excessive consumption and natural events with heavy material traffic, high temperature, sunshine, and calm winds. Nitrogen oxides from coal power plants, factory emissions, and car exhaust are other causes of this challenge. Zig-zag technology in brick kilns is likely to be more effective and releases low carbon emissions. Pakistan has been shifted to eco-friendly zig-zag technology. It is more cost-effective and less hazardous to the environment. Also, energy and fuel-efficient and produces better bricks. Punjab brick kilns follow this technology and other provinces need to follow this model. It is considered that releasing the soot full of hazardous components is environmental terrorism. Volatile organic compounds (VOCs) are released from paints, gasoline, and several kinds of cleaning solvents and sunlight hits these chemicals, smog or ground-level ozone is created. VOCs react with nitrogen oxides emitted from power plants, brick kilns, vehicles, and industrial activities to make ozone which in turn helps the formation of fine particles which result in the form of smog. VOCs react with nitrogen oxides (NOX) and carbon monoxide (CO) to form ozone (O3) which is often considered smog. Methane prevalent greenhouse gas is released in conjunction with VOCs and trapped within the atmosphere increasing earth temperature. The industrial processes and sectors are responsible for greenhouse gases released into the air. The Industrial processes that release high levels of VOCs must follow environmental pollution control rules made by the EPA.

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The main sources of smog include buses, cars, trucks, trains, and buses as well as industrial facilities, factories, power plants, and oil refineries. There are some other sources such as agricultural areas, cities, and wood fireplaces. Wildfires, volcanoes, and wind-blown dust also contribute. Primary pollutants involved in smog include nitrogen oxides, VOCs, and photo chemicals. Industrial smog typically exists in urban areas where power plants and factories use coal, which creates smoke and sulfur dioxide that mix with fog to create a blanket of mist close to the ground. For the past many years, different parts of the world are being affected due to smog, including Delhi, Beijing, London, Los Angeles, Mexico City, Santiago, Tehran, Ulaanbaatar, Lahore, and Southeast Asian cities. This is a global phenomenon and affects major industrial cities of the world. These cities are often trapped by pollution close to the ground. This is toxic to humans and can cause severe health hazards that are especially harmful to children, senior citizens, and persons with lung and heart conditions, such as asthma, bronchitis, and emphysema. It can cause nose and eyes irritation with further complications including respiratory diseases.

The air quality index of Lahore is becoming worse day by day due to a layer of winter smog. Environmental scientists have condemned the government of Punjab for improper work in checking air pollution and giving awareness about air quality index issues and challenges. The government has taken some measures but it lacks coordinated efforts and long-term planning with a proper action plan.

Pakistan is facing this challenge, especially in the cold season with dense and massive smog with pollutants covering major cities and areas of Punjab, especially Lahore, causing health issues and affecting normal traffic. Lahore gets smoggier day by day and is even beating Delhi as the world’s most declared polluted city. Lahore’s air pollution level has dipped to severe category. Citizens of Lahore asked the government to take stock of this grave situation and take revolutionary steps regarding air pollution and smog with the help of the general masses. The EPA role should be redefined as per international standards and UN climate action plan with modern techniques and tools but with strong political will and engaging all stakeholders with dedication and commitment at all levels. Bold effects to check air pollution and introduce alternative fuel initiatives are the need of the hour. Conversion of Lahore buses and public transport to CNG and promotion of electric vehicles in the future is necessary to combat this challenge in large cities.

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