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# Air Pollution in Palestine

By Dr. Mohammad Kardeen

Air pollution is a concentration of foreign matter in the air that adversely affects the health and welfare of people. Air pollutants are the liquid, solid, gaseous, radioactive, or microbial chemicals suspended in the air that are caused by different human activities related to industry, construction, transportation, or natural resources. Such pollutants cause harmful effects to humans, animals, and plants.

Air pollution is considered one of the main pollution problems around the world. Most countries consider this problem a threat to national health and enforce strict regulations, among other solutions, trying to reduce it as much as possible.

The main pollutants found in the air are from combustion. Carbon Monoxide (CO) is produced by incomplete combustion of hydrocarbon-based fuels, and it enters the bloodstream through the lungs and forms carboxyhemoglobin, which affects both healthy and ill people. Hydrocarbons (C<sub>x</sub>H<sub>y</sub>) are emitted by unburned or partially burned fuel, and also when fuel evaporates directly into the atmosphere. Hydrocarbons include many toxic compounds that cause cancer and other adverse health effects. They also react with nitrogen oxides (NO<sub>x</sub>) in the presence of sunlight to form ozone. A very significant portion of nitrogen oxides comes from cars in urban areas. These highly reactive gases are colourless and odourless, but they can often be seen combined with particles in the air as a reddish-brown layer of smog over many urban areas. Because their formation is aided by high temperatures and excess oxygen, motor vehicles are the primary source of nitrogen oxides. Carbon Dioxide (CO<sub>2</sub>) is a product of perfect combustion. As a pollution concern, it doesn't directly impair human health, but it is a "greenhouse gas" that traps the earth's heat and contributes to the potential for global warming. Particulate matter (PM) is produced from diesel-powered vehicles, quarrying, and other industry. Melting lead and burning solid wastes are other major sources of air pollution.

The main sources of air pollution in Palestine are the various means of transportation, the smoke rising from the chimneys of factories, the heavy dust from quarries, the burning of solid wastes, and the effects of water treatment projects. The Israeli industries in the West Bank, Gaza Strip, and inside the part of Palestine occupied in 1948 are the biggest cause of atmospheric pollution in Palestine. Many Israeli sawmills pollute the air across the West Bank with large quantities of greenhouse gases. A 2009 study prepared by George Karzam of the Ma'an Development Centre predicts that the greenhouse gases emitted from the territories occupied in 1948 will increase by 40 percent by the year 2020.

In the West Bank, there is a little data collected on air pollution, including some notes concerning the sources of such pollution. Between 40 and 50 percent of air pollution comes from urban areas. It comes from coal factories in Jenin; quarries; the random burning of solid waste; the use of pesticides, such as methyl bromide, which has a bad effect on the ozone layer; the emission of smog from the factories inside Israeli settlements in the West Bank; and the smog from Israeli factories, which is moved by the wind toward the West Bank.

According to a report from the Applied Research Institute of Jerusalem from 2009, statistics indicate that there are 20 industrial settlements distributed around the West Bank (five industrial settlements in Salfit, four in Qalqilya, three each in Hebron and Jerusalem, and one settlement each in Nablus, Jenin, Jericho, and Bethlehem). This is in addition to the establishment of at least seven industrial zones in the Palestinian territories on the border of the area of Palestine occupied in 1948, which were created by the Israeli government as part of its policy of apartheid.

Emissions of carbon dioxide and methane from factories in a settlement called Burkan in the area of Salfit travel over 600 km, where they accumulate in the atmosphere and cause the risk of global warming. (Ayeser Toameh, 2010). This is in addition to air pollution emitted during the transfer process, such as gases from fuel, diesel, bromide, hydrochloric acid, and ammonia. According to the testimony of the Israeli Ministry of Environment, these factories lack storage compartments that meet specifications required by Israeli regulations.

Another prominent cause of pollution is Israeli quarries in the West Bank, which release massive amounts of dust into the air, damaging a wide range of agricultural land when the dust falls on agricultural crops and trees. Six Israeli quarries were established in the West Bank to provide stone for use in the construction sector, and these quarries cover 80 percent of Israeli needs.

In the Gaza Strip, the issue of air pollution is attributed to the density of motor vehicles, estimated at about 60,000, and especially to the number of old vehicles. Also, air pollution is caused by the gases and smog emitted from Israeli factories, especially from coal-operated power stations, and transferred to Gaza Strip by the wind. These factories are located in Isdud (Ashdod) and Al-Majdal (Ashqelon) inside the part of Palestine occupied in 1948.

If we were to look at the effects the unjust siege of the Gaza Strip has had on the environment, we would find painful facts about air pollution. Toxic gases, including sulphur dioxide and carbon monoxide, which harm the respiratory system, are released into the air as a result of the use of the large numbers of people who run home generators to compensate for the shortage in electricity caused by Gaza's inability to run its power plant full-time due to the acute shortage of fuel. It is estimated that there are about 100,000 of these generators in use and that they consume about 500,000 litres of fuel per day. Therefore, the environment in Gaza Strip requires a more thoughtful and comprehensive policy of planning, awareness, and conservation.

In general, these environmental problems have multiplied, causing socio-economic problems and increasing health hazards. Observing the situation of air pollution in Palestine will lead to the conclusion that many factors needed to solve this problem are absent. For instance, there is no comprehensive national plan to tackle various environmental problems, including air pollution problems; no control against exceeding the permitted levels of pollutants, even from ministry of transportation or the environmental authority; no observation or testing centres responsible for licensing vehicles; no measuring station for air pollution in urban areas and city centres; no follow-up for overloaded vehicles that violate safety and environmental regulations; an absence

of specialised teams in air pollution; and a scarcity of specialists, leading to a scarcity of studies and real facts about air pollution.

The alarm bells are ringing, alerting us to the danger of air pollution. We should start addressing this problem immediately by activating environmental authorities to create a comprehensive plan to study air pollution problems and their solutions. Non-profit societies and associations could combine their efforts to solve this problem by establishing teams to help with environmental awareness and encouraging people to use environmentally friendly transportation, such as public buses or other mass transit, or even traveling by foot for short distances.

Finally, the problem of air pollution is not only in Palestine, it is one of the earth's many problems. Its solution has to be on a global scale. This could be achieved by discarding our current brutal system and moving to a system of justice, which prevents the earth's wealth from eroding. Our hope is to see Palestine's air, as well as the entire earth's atmosphere, free of all types of pollutants.

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