

A STUDY ON POLLUTION



Cyclists in Beijing wear face masks as they ride through thick smog caused by pollution. Photograph: Feng Li/Getty Images, via The Guardian



Air and water pollution in western China. Source: C.Michael Hogan

Pollution is environmental contamination that results in harm or death to living organisms. Most pollution is in the form of chemical additions to air, water or soil; however, in modern times starting in the mid-twentieth century noise and light have been considered as pollution sources. Most pollution is man-made, with natural fluctuations in atmospheric composition, surface water bodies and soil considered temporal gyrations in the Earth's natural history. The chief driver of pollution is the massive growth in human population, which induces the proximate causes of intensive agriculture and extraordinary industrial output. The United Nations and the Blacksmith

Institute^[1] are two prominent organisations that tabulate locales of the greatest pollution intensity; while their listings do not correspond precisely, the overlap countries that both entities agree are the worst polluted are: China, India, and Russia. Beyond the human health effects of pollution, habitat destruction is a widespread consequence, especially with regard to water pollution.

History



King Edward I banned coal burning in London, 1272 AD^{See main article: *Pollution: a brief history*}

Earliest evidence of man-made pollution derives from ice core records, from which aspects of the prehistoric atmosphere can be deduced. Analyses of this data indicate noteworthy mass burning by early man in the early to middle Holocene period, giving rise to significant air pollutants.^[2] The records from that era reflect deposition of air pollutants from vegetation burning on lake and ice surfaces. Studies on cave dwelling *Homo sapiens* in Europe document the presence of indoor air pollution from soot residues on the cave ceilings at an even earlier time from the pre-Holocene.^[3]

The Holocene also witnessed the first clearly defined water pollution in the form of excessive sediment transport, which clogged certain ancient ports of Europe and Asia Minor, notably the Danube Delta of the Black Sea; such river siltation was generated from soil erosion caused by the first farmers who were clearing forests at a rapid pace for crops and grazing. Evidence of some of the earliest industrially generated air pollution is found in the ice core records of Greenland's glaciers, in which traces of metals refining can be recovered dating to the classical Greek and Roman eras, as well as the Han Dynasty of China.^[4]

Some of the first recorded history of pollution relates to 13th century England,^[5] when coal burning began to replace wood use, after significant deforestation had by this time occurred in much of Europe. In 1272 and 1306 AD there were significant bans placed on burning coal in London, due to significant public outcry from the air pollution. By-products of the Industrial Revolution in much of Europe were substantial air and water pollution, a milestone of which was

the Great Stink of 1858 arising from untreated sewage discharged to the River Thames in London.

Sources



oxic sludge spill, Danube River. Source: Bela Szandelszky *See main articles: Air pollution, Water pollution.*

Major sources of air pollution are transportation, agriculture, industrial, construction and solid waste landfills. Transportation sources, mainly due to combustion of petroleum fuels, are some of the most difficult to mitigate since the emissions are generated in the heart of populated areas. Agricultural sources include significant methane generation from livestock; particulate dust from land cultivation and pesticide aerosol sprays. The principal industrial sources of air pollution are fossil fuel burning power plants; heavy manufacturing; petroleum and metals refining.

Construction work generates particulate and fossil fuel combustion products as well as a variety of paint and solvent off-gasses. Landfill decaying organic matter produces methane gas, and landfill working face operations produce significant dust; in addition, landfill burning in lesser developed countries is a source of significant carbon monoxide and other air pollutants.

Chief producers of water pollution are agricultural, transportation and industrial uses as well as human sewage sources. Agricultural runoff includes a host of phosphate and nitrogen fertilizers; however, the most toxic elements of agricultural runoff are often from pesticide usage. The most significant physical water pollutant from agricultural use is excess sediment in runoff from crop cultivation as well as clearcut forests. Transportation impacts derive chiefly from runoff of roadways and parking lots, where petroleum hydrocarbons, lead and sediment are common constituents of such runoff. Leaking underground fuel storage tanks may be attributed to both transportation and industrial functions. Other Industrial sources include solvents, heavy metals, acids and a host of organic chemicals. Principal industries contributing to water pollution are metals refining, food processing, pulp and paper industries and chemical factories.

Worldwide untreated sewage is an important source of water pollution in the form of suspended solids, decrease of dissolved oxygen and pathogenic microbes; over three billion people are

currently subjected to unsafe drinking water, chiefly due to such microbial contamination. Leaching of chemicals from poorly designed landfills is a further component of water pollution, which affects both surface as well as groundwater. Thermal pollution may be considered a manifestation of water pollution, and it is mainly associated with the waste heat discharge from large power generation and manufacturing plants.

Noise pollution sources are chiefly transportation related, since motor vehicles, trains and aircraft produce approximately 90 percent of all unwanted acoustical energy, with industrial plants and amplified sound contributing most of the balance. Light pollution, or over-illumination, is a more subtle form of environmental contamination, but excessive lighting causes not only annoyance, but also health effect impacts; additionally large scale atmospheric lighting can interfere with astronomical observations.

Source : <http://www.eoearth.org/view/article/51cbeea57896bb431f699572/?topic=51cbfc78f702fc2ba8129e73>