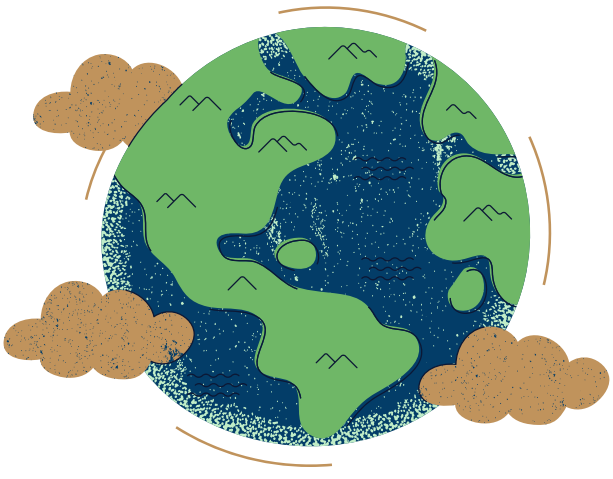
Atmospheric Brown Cloud

Aamiya Rana
Kamala Nehru College, University of Delhi

Atmospheric brown cloud is a layer consisting of aerosols such as dust and smoke which absorb as well as scatter The Incoming solar radiations, leading to climatic effects and risky for human health and food security. The extension of this layer is roughly 3 kilometres from the earth surface. The atmospheric brown clouds in urban areas (Urban brown clouds) are a result of air pollution caused by thermal inversions.

This phenomenon was first observed in 1990 as part of the Indian Ocean experiment index (INDOEX) in which air pollution was measured with the help of aircraft, satellites, surface stations and balloons. The observations made during the study surprised the researchers by disclosing a huge number of aerosols formed over most of South Asia and the Northern Indian Ocean. These brown clouds are termed 'Asian brown clouds'. This Asian brown cloud is an annual phenomenon that occurs mainly from the month of November through May. As per the analysis made so far, it has been observed that atmospheric brown clouds are a global phenomenon and are human-generated in association with air pollution from Africa, North America, South America and Europe, also Asia. These are frequent in tropical regions due to its prolonged dry season, which prevents aerosols from being removed from the atmosphere through precipitation.



Pollution is Causing a Revolution

Chakr Innovation, located in Delhi, has developed the world's first retrofit emission control device for diesel generators. It collects 90% of particulate matter emissions from exhaust air while maintaining high energy efficiency. Inks and paints are made from diesel soot recovered from the exhaust.

Aerosols are majorly made up of black carbon and organic carbon. The black ones absorb solar radiation, resulting in solar heating of the atmosphere. Organic carbon aerosols such as sulphates and nitrates scatter the solar radiations back to space. The total impact of these aerosols results in ‘dimming’ (produced due to reduction in solar radiations reaching the surface of the earth). Due to this dimming effect, India and China are dimmer at the surface today by at least 6 percent in comparison with their pre-industrial time states.