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Sub : Environmental Studies

Some classic case studies :- Air pollution

1. Taj Mahal, Agra, India : A symbol of love
affected by air pollutants.

Taj Mahal means crown palace. Emperor Shah Jahan constructed this historic monument in the memory of his dear wife Mumtaz Mahal at Agra, India as an expression of love for his wife. It was constructed over a period of twenty-two yrs, employing twenty thousand workers and was completed in the year 1648. The innumerable industries in and around Agra released a large amount of sulphur dioxide, suspended particulate matter, smoke, soot etc causing tanning, blackening and yellowing of the marble stone. The oxides reacting with rainwater resulted in acid precipitation and in return caused the deterioration and corrosion of the Taj.

In 1984 Sh. M.C. Mehta, an environmental lawyer filed a public interest litigation regarding the effect of pollutants on the historic monument. Following this, the Supreme

court of India ordered 292 industries in the Taj area to be shut down and or adopt cleaner control technologies.

Most of the populated metropolitan cities like Mumbai, Chennai, Delhi, Kolkata are heavily polluted. During peak office hours the air is hazy, smoky and suffocating and is a serious problem. The air pollution control Act, 1981 was passed to control and abate air pollution. Following the Bhopal gas tragedy, the Environment protection Act 1986 was passed its national ambient air quality monitoring by National Ambient Air quality monitoring programme [NAAQM]. These acts have focused on improving the quality of vehicular fuels, awareness among the general public, using renewable sources of energy and in the control of pollution.

2) The London smog of 1952 : A classic air pollution case study.

During the cold month of Dec. the people of London burnt large amounts of coal for heating their homes, which resulted in a huge amount of smoke, soot, ash, SO₂, etc generated from the chimneys. On 5 Dec 1952, the temp. went down to -1°C and

the humidity at 80%. There was a thick fog and the air near the ground was moist usually, the air close to the ground is warmer than the air above it, and therefore rises but in this particular event it resulted in the formation of a static layer of cooler air close to the ground, which is an atmospheric phenomenon called temp inversion.

The accumulation of smoke close to the ground was so much that the sunlight was totally cut off and the air stayed cool and static. The term smog means fog that has soot in it. Thousands of tons of black soot, sticky particles of fog and gaseous sulphur dioxide trapped in the fog gave it yellow-black colour. Average smoke measurements taken at the National Gallery in London betⁿ the 4 and 8 Dec. 1952 showed that the PM concentration was 56 times the level normally experienced and the sulphur O_2 level increased by 7 times [700 ppb]. Around 4000 people died due to the smog causing pneumonia, bronchitis, tuberculosis, heart failure, asphyxiation, chest pains, inflammation of the lungs, damage to respiratory cells, permanent lung damage, respiratory ailments susceptibility to cancer etc. The effect on

vegetation were profound due to the resulting acidic rain. Following this disaster event, London Formulated the clean Air act 1956 and all the traditional coal fires were converted to heaters fueled by gas, steam, hot water, oil, smokeless coal & electricity.

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case studies

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Impact of 2019 Flood in Satara, Sangli & Kolhapur

In August 2019, extremely heavy Monsoon rainfall and large water releases from dams caused severe flooding in Western Maharashtra, especially in Satara, Sangli, and Kolhapur.

Kolhapur

Major Impacts:

- Severe flooding of Panchganga River - Large parts of the city were underwater.
- over 3 lakh people evacuated from Kolhapur district.
- Hundreds of villages cut off due to submerged roads and bridges.
- Electricity and drinking water supply disrupted for several days.
- Heavy damages to houses, shops, and vehicles.
- Sugarcane farms and dairy industry badly affected.

Kolhapur was the worst affected district among the three.

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Sangli

Major Impacts:

- Krishna River overflowed, flooding Sangli city and nearby towns.
- Around 1.5 - 2 lakh people evacuated.
- National highways and railway lines were temporarily closed.
- Many homes submerged up to the first floor.
- Business activities stopped for several days.
- Schools and colleges remained closed.

Satara

Major Impacts:

- Heavy rainfall caused rivers like Koyna and Krishna to overflow.
- Several villages in Karad and Patan areas flooded.
- Landslides reported in hilly regions.
- Crop damages and livestock losses.
- Road ^{classmate} transport badly affected.

Overall Impact

- More than 4-5 lakh people displaced across the three districts.
- Dozens of deaths reported due to flood-related incidents.
- Thousands of houses damaged.
- Huge loss to agriculture, especially sugarcane crops.
- Economic losses worth thousands of crores.
- Rescue operations carried out by National Disaster Response Force (NDRF), Army and Navy.

Conclusion

The 2019 Maharashtra floods were one of the worst in recent history for western Maharashtra. Kolhapur and Sangli were severely affected, while Satara also faced heavy damage. The disaster highlighted the need for better flood management, dam co-ordination and disaster preparedness in the region.