Sand and Dust Storms Risk Assessment in Asia and the Pacific

Why in News

According to a new **United Nations (UN)** report, more than **500 million people in India** and **more than 80% of the entire populations** of Turkmenistan, Pakistan, Uzbekistan, Tajikistan and the Islamic Republic of Iran are **exposed to medium and high levels of poor air quality due to sand and dust storms.**

- The **risk of impacts from sand and dust storms is projected to increase in the 2030s** due to more extreme drought conditions in parts of Western Australia, south-easternTurkey, Iran and Afghanistan.

Key Points

- **Sand and Dust Storms:**
    - **About:**
        - Sand and dust storms are **common meteorological hazards** in arid and semi-arid regions.
        - They are usually caused by **thunderstorms – or strong pressure gradients** associated with cyclones – which increase wind speed over a wide area.
        - Some **40% of** aerosols **in the troposphere (the lowest layer of Earth's atmosphere)** are dust particles from wind erosion.
    - **Main Sources:**
        - The main sources of these mineral dusts are the **arid regions of Northern Africa, the Arabian Peninsula, Central Asia and China.**
        - Comparatively, **Australia, America and South Africa make minor,** but still important, contributions.
- **Impacts:**
    - **Negative:**
        - **Impact on Power Plants:**
            - They can interfere with energy infrastructure, adversely affecting electricity transmission lines and causing power outages.
            - India, China and Pakistan witnessed **1,584 gigawatt-hours (gWh), 679 gWh and 555 gHw of energy loss,** respectively.
            - These losses amounted to over **Rs. 782 crore for India per year.**
        - **Affect Source of Freshwater:**
            - Very high dust deposition also occurs in the **Himalaya-Hindu Kush mountain range** and the **Tibetan Plateau,** the so-called **'third pole'** that

are the sources for fresh water for more than 1.3 billion people in Asia.

- **Increases Melting of Ice:**
    - The deposition of dust on glaciers induces a **warming effect,** increasing the melting of ice, with direct and indirect impacts on society through numerous issues, including food security, energy production, agriculture, water stress and flood regimes.
- **On Farmland:**
    - Dust deposition **impacted large portions of farmland** in Turkmenistan, Pakistan and Uzbekistan.
        - Much of this dust is characterised by **high salt content, making it toxic for plants.**
    - It **reduces yield,** posing a significant threat to the production of irrigated cotton and other crops.
- **On Sustainable Development Goals (SDG):**
    - They directly affect **11 of the 17 United Nations-mandated** Sustainable Development Goals (SDG)**:**
        - Ending poverty in all forms, Ending hunger, Good health and well-being, Affordable and clean energy, Decent work and economic growth, Climate action, etc.

◦ **Positive:**

- They can **increase the nutrient content in the areas of deposition** and benefit vegetation.
- Dust **deposited on water bodies can alter their chemical characteristics,** triggering both positive as well as adverse outcomes.
- Dust particles that carry iron can enrich parts of oceans, **improving the phytoplankton balance and impacting marine food webs.**

▪ **Suggestions:**

◦ Their impacts are complex, and thus, they represent **an important emerging issue for policy-makers in the Asia-Pacific region.**
◦ Member States **need to strategize their joint actions,** considering gaining a deeper understanding of the socio-economic impact of sand and dust storms, establishing a coordinated monitoring and early warning system with an impact-based focus, and coordinating actions in most at-risk and exposed geographical areas to mitigate the risks.

Source: DTE